

Accounting Professional Education Schemes: Case of Czech Republic and Estonia

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Abstract: - The knowledge level of professional accountants is emerging issue in each economy. Change of economic environment in Central and Eastern Europe in 90s of 20th century brought new requirements on professional accountants. This paper provides the comparative analysis between accounting certification schemes in the Czech Republic and Estonia (two emergent countries from the area of CEE), which are applied on professional accountants. Those schemes are also compared to international referential (qualifications ACCA, CPA Australia and AIA). The results show very high level of convergence between Czech model and international qualification schemes.

Key-Words: - Accounting Certification; International Education Standards; Association Coefficients; Professional Accountants; Czech Republic; Estonia

1 Introduction

According to [2] accounting is firmly established as an important profession and as a major employment destination. In addition they believe that there is some ambivalence regarding the image of the accounting profession as well as the status of accounting as an academic discipline.

The accounting profession desires a wider range of capabilities (over and above technical ability) that accounting graduates should possess, e.g. the ability to manage stress, an awareness of personal values, a basic knowledge of psychology, communication skills, motivation, persistence, empathy and a sensitivity to social responsibility [6]. The profession has a responsibility towards members to encourage the cultivation of some of these skills and not focus so severely on only technical ability. The current accounting education is often focused on the acquisition of knowledge and an over-emphasis on technical knowledge in order to pass the professional examinations, rather than focusing more on the utilization of knowledge and more holistic attributes [1, 4].

This paper provides evidence about accounting certification schemes which are run in the Czech Republic and Estonia and compare them to international

schemes. For the level of compatibility there will be used association coefficients for similarity (harmonization) and dissimilarity measurement.

2 Accounting Certification Schemes

Numerous researches deal with information potential of measurement and accounting. Information systems are to assure enough information and transfer it according to a company's need, in relation to a company organization structure [8]. Knowledge is a fluid mix of framed experience, values, contextual information, expert insight and grounded intuition [5]. One portion supports day-to-day decision making; another part is used for tactical and strategically decision making [9].

2.1 Accounting Certification Schemes in the Czech Republic

2.1.1 Certification of Accounting Professionals

Due to the aim of some standardization and harmonization of the knowledge of the professional accountants, the certification system based on the British ACCA professional scheme was started in the Czech Republic in 1997. It was developed under the

supervision of the Czech Ministry of Finance, EU PHARE and of course the British ACCA. The education and examination system was arranged in order to follow the original International Education Guideline 9 (IEG 9). This Guideline with the UNCTAD Qualification Guideline (from 1983) has been taken into account while forming education and examination systems.

System of accounting certification in the Czech Republic is run via Institute of Accounting Certification who has an exclusive contract from Union of Accountants CR. The total number of adepts of certification is currently higher than 10 000 people, from whose 55 % people are certified (however majority of them holding the technician accountant level).

During the period 1997 – 2008 was used three level system of the certification in Czech which especially stresses the attention of the “triumvirate” Accounting – Law – Taxes. Each adept should fulfill the following papers (see Table 1):

Table 1. Certification Exams in 1997-2008

Technician level	
P1	Financial Accounting I
P2	Law System I
P3	Quantitative Methods and ICT I
P4	Economics
P5	Taxation I
Executive level	
P6	Financial Reporting
P7	Taxation II
P8	Managerial Finance
P9	Managerial Accounting
P10	Quantitative Methods and ICT II
P11	Law System II
Expert level	
P12	Financial Strategy
P13	IFRS
P14	Financial Analysis
P15	Auditing

Source: www.icu-praha.cz

All exams are in written-form and the precision ratio requested for passing all exams is 60 %.

To be able to enter this system it is necessary to be educated minimally at the high school (having a school-leaving exam). For the finalizing of all of the levels it's also necessary to fulfill the practical experience: 2 years for technician level, 4 years for executive level and 6 years for the expert level. On the other hand it is also possible to apply for the system of the controlled practice: 1 year for technician level, 2 years for executive level and 3 years for the expert level.

Table 2. Precision Ratio at the Exams

Exam	6/2008	12/2007	6/2007	12/2006	6/2006	12/2005	6/2005	12/2004	6/2004	12/2003	6/2003
P1	86.96	55.22	64.62	83.33	73.97	64.29	63.51	86.81	77.97	65.38	80.67
P2	25.71	66.38	78.75	55.43	76.60	66.67	62.80	86.02	83.03	71.38	62.14
P3	75.00	51.72	55.56	69.09	55.00	61.90	69.80	55.80	47.50	28.31	67.86
P4	22.73	59.38	19.18	51.82	38.83	63.38	64.08	51.05	41.88	61.08	65.92
P5	74.42	80.00	86.61	78.63	67.52	84.62	66.67	60.43	64.68	71.34	62.45
P6	47.78	86.90	84.78	64.18	75.79	89.90	85.39	71.43	70.24	95.83	79.52
P7	62.86	73.17	72.41	69.47	68.75	59.38	60.26	76.32	57.33	86.72	67.83
P8	82.95	78.85	84.75	75.86	80.82	61.90	73.33	66.67	48.84	65.05	62.50
P9	85.00	81.20	67.03	58.88	57.48	37.21	52.90	33.09	41.06	35.54	20.00
P10	100.00	54.17	76.92	73.08	85.70	88.20	70.00	80.00	63.30	60.71	77.42
P11	54.55	82.35	96.23	56.72	85.94	91.67	73.17	81.25	99.12	74.04	68.13
P12	40.00	68.75	68.75	52.17	60.87	65.52	59.09	53.33	56.52	56.67	65.38
P13	25.00	25.00	71.43	94.44	87.50	96.30	60.00	84.00	70.59	77.78	90.91
P14	100.00	93.33	100.0	94.12	93.75	100.0	77.78	99.45	100.0	94.74	95.24

P15	100.00	100.0	100.0	100.0	100.0	100.0	87.50	100.0	100.0	100.0	100.0
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Source: www.icu-praha.cz

The certification scheme has been changed since 2008. It shall be stated that the International Education Standards (IES) stress or shape newly the tendencies which have been influencing the development of the accounting profession in the last decade (especially professional ethics, development of communication and interpersonal abilities, ICT etc.). Currently the system is based just on two levels: (i) certified accountant, and (ii) accounting expert. The exams are following (see Table 2):

Table 3. Certification Exams since 2008

<i>Certified accountant level</i>	
P1	Financial Accounting I
P2	Law System
P3	Quantitative Methods and ICT
P4	Management Economics
P5	Taxation
P6	Corporate Financial Reporting
P7	Professional Ethics
P8	Managerial Finance
<i>Expert level</i>	
P9	Managerial Accounting
P10	IFRS
P11	Advanced Financial Management
P12	Management
P13	Auditing

Source: www.icu-praha.cz

All exams are in written-form however the precision ratio requested for passing all exams is currently only 50 %. The length of practice is based on historical second, resp. third level; i.e. for certified accountant level 4 years and for expert level 6 years of practice.

Table 4. Precision Ratio at the Exams

Exam	12/2009	6/2009	12/2008
P1	73.91	77.78	76.36
P2	62.50	72.57	48.36
P3	62.50	90.91	44.44
P4	88.89	71.88	66.67
P5	77.03	54.24	54.55
P6	25.24	71.83	35.48
P7	88.11	91.33	95.57
P8	82.67	64.29	29.63
P9	100.00	100.00	N/A
P10	4.17	38.89	60.87
P11	60.61	33.33	50.00

P12	100.00	100.00	100.00
P13	100.00	100.00	100.00

Source: www.icu-praha.cz

Successful adepts of the certification scheme (certified accountant level or executive level and higher) may be member of professional chamber. Until 2009 there exists the Chamber of Certified Accountants, professional body which is the part of Union of Accountants CR. Due to the new incompetent Executive Board of the Union it was impossible to develop the professional level of the Chamber from 2008 and in December 2009 there was imposed compulsory management from the Union. Therefore has been established brand new **Chamber of Certified Accountants Czech Republic (CCA CR)**, self-governed body representing the professional accountants in the Czech Republic.

The primary goals of this Chamber are to contribute to the development and improvement of the accounting profession in the Czech Republic by implementing an accounting professional certification system, providing the continued professional development of accountants, issuing a Code of Ethics and other standards regulating the activities of professional accountants, supervising professional accountants' adherence to standards, collaborating in the development of accounting professions and in the field of accounting methodology and the assertion of legislative regulations of the accounting profession with other professional organizations and economic universities.

Members of the Chamber are obliged to complete 40 hours of the CPD per year; of this, at least 30 hours must be structured education. Should a member fail to comply with this obligation in a given period of time, the fulfillment of the obligation may be postponed to the subsequent two years, with at least 120 hours of the CPD completed in all three successive periods. It is deemed that the CPD may be terminated only in the event of the given member's terminating the discharge of his/her profession.

The topics of CPD are following:

Accounting topics

- * *Current issues in Government Accounting*
- * *IFRS for Small-and-Medium-Sized Enterprises*
- * *Current issues in accounting of entrepreneurs*
- * *Current issues in IFRS*
- * *Consolidated financial statements*
- * *Financial reporting of banks and other financial institutions*
- * *Financial reporting of insurance companies*
- * *Financial reporting of municipalities*
- * *Payroll accounting*
- * *Internal auditing*

Taxation topics

- * *Current issues in VAT and income taxes*
- * *Current issues in direct and indirect taxes*
- * *Tax issues of business combinations*

Financial management topics

- * *Calculation and budgeting*
- * *Financial analysis*
- * *Financial planning*
- * *Investment decisions*
- * *Risk management*
- * *Funding from the E.U.*

Legal topics

- * *Criminal Code and its influence on accounting profession*
- * *Current issues in business law*
- * *Current issues in labour law*
- * *Arbitral procedure*

Other topics (soft skills)

- * *Communication skills*
- * *Management skills*
- * *ICT in accounting practice*
- * *Code of Ethics for Professional Accountants*

Source: www.kcuqr.cz

2.1.2 Certification of Auditors

The **Chamber of Auditors Czech Republic (CACR)** was the only organization for accounting professionals by the year 1997. This organization is established by the Act on Auditors and all auditors shall be members of this Chamber. The main aim of CACR, member of IFAC and National Accounting Board, is to regulate the audit profession in the Czech Republic. Currently there is 1274 active auditors (CPAs) and 344 audit companies ("Big 4" included) in the Czech Republic.

All auditors shall follow the Code of Ethics and Continuous Professional Development (CPD). The length of CPD is 40 hours per year at least. CPD is organized by Institute of Education of CACR that is why auditors shall attend trainings mainly organized by this Institute. Other forms of CPD are "traditional": (i) lecturing activities; (ii) professional publishing activities; and (iii) e-learning.

When applying for the CPA license, adepts shall fulfill following 11 exams (see Table 3):

Table 5. Auditor Qualification Scheme in CR

P1	Consolidation and Business Combination
P2	Taxation
P3	Law System
P4	Corporate Finance
P5	ICT and Statistics
P6	Auditing
P7	Microeconomics
P8	Macroeconomics
P9	Managerial Accounting
P10	Financial Reporting

P11	Methodology of Audit (Auditing II)
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Source: www.kacr.cz

All exams are in written-form, however after passing all eleven exams, candidates have to fulfill last oral exam concluding all topics. The precision ratio requested for passing all exams is 60 %. To be able to join the scheme adept has to have at least three years of practice as an assistant auditor.

2.2 Accounting Certification in Estonia

Certification of professional accountants in Estonia runs via Estonian Accounting Association (EAA). EAA was established in 1996 with the will to contribute to the development and improvement of the accounting profession in Estonia by implementing an accounting professional certification system. Membership within EAA is voluntary, but what is very interesting is the fact, that to be member of this body there is required any qualification. Currently EAA has more than 700 members.

Accounting certification in Estonia is younger than the Czech one starting in 2004. Currently it is a three-level system – (i) technician accountant; (ii) accountant; (iii) expert level. Currently there are any candidates within the highest expert level. For the accountant level there is required two years of practice and for the expert level there is required five years of professional experience. The certificate received more than 1 100 accountants, however 95 % of them are holders of the technician accountant certificate.

Technician accountant level is very popular in Estonia by the graduates from high school. In case, that the candidates are up to one year after the graduation, the exam is for them free of charge.

What is different from Czech certification scheme (as well as from international ones) is the fact that there is only one exam for each level. All those exams are based in the following area of knowledge:

- general knowledge
- organizational and business knowledge
 - Business economics
 - Basic Terminology
 - Entrepreneurship
 - Marketing
 - Business Finance
 - Business Mathematics
 - Basics of International Business
 - Statistics
 - Terminology
 - Statistical surveys
 - Preparation and analysis of statistical tables
 - Methods of statistics

- Business ethics
- information technology knowledge
- accounting and accounting related knowledge

There is expected basic or intermediate knowledge for the technician level; intermediate or advance knowledge for the accountant level; and advance (expert) knowledge for the highest level from all above mentioned disciplines.

Tests are in written form and there is expected precision ratio of 75 % for technician accountant level and 60 % for the accountant level.

Technician Accountant Level

The level “Technician Accountant” (also called Bookkeeper or Accounting Assistant) is the very first level of the certification process. There are not expected any prequalification or specific education for entering this level, however the high school education is slightly expected and recommended. The main tasks for adepts of this level are: (i) preparation of documents, (ii) participation in physical inventories, (iii) data entry, and (iv) technical accounting work. That is why they may have an ability to work at different companies as accountants for certain part of assets (e.g. accounting for tangibles; accounts receivable and accounts payable, cashier, etc.).

Table 6. Requirements on Technician Accountants

Main professional skills and knowledge	Level
General Knowledge	B
Business Economics	B
Statistics	B
Business Ethics	B
Communication Skills	I
Intellectual Skills	I
The Usage of Office and Network Systems	I
Working Environment	I
Accounting Knowledge:	
Accounting Terminology	B
Estonian Accounting Act	B
Accountant’s Professional Ethics	A
Preparation and Preserve of Accounting Source Documents	B
Methods of Accounting	B

Note: B-basic, I-intermediate, A-advance

Source: Estonian Accounting Association

Accountant Level

For the second level called “Accountant” (or Accountant II) there is required two years of professional experience. The main tasks for adepts of this level are: (i) verification of documents, (ii) classification and registration of transactions, (iii) preparation of financial statements, (iv) preparation and documentation of

budgets, (v) stocktaking, (vi) calculation of taxes and preparation of tax returns, and (vii) participation in building-up an internal control system. Therefore adepts of this level are able to perform standard accounting and taxation work as well as to make simple financial analysis or prepare budget of the company.

This exam is connected with the absence of relevant professional literature and Estonian professional accountants are not very familiar with globally used methods in financial and cost accounting. Moreover some practitioners state that methodology is something “very scientific” and therefore not necessary in practice.

Table 7. Requirements on Accountants

Main professional skills and knowledge	Level
General Knowledge	I
Business Economics	I
Statistics	I
Business Ethics	I
Communication Skills	I
Intellectual Skills	I
The Usage of Office and Network Systems	I
Working Environment	I
Accounting Knowledge:	
Accounting Terminology	I
Estonian Accounting Act	I
Legislation related to Accounting	I
Accountant’s Professional Ethics	A
Principles of Organization of Accounting	I
Preparation and Preserve of Accounting Source Documents	A
Documentation of Business Transactions	A
Methods of Accounting	A
Principles of Financial Reporting	A
Preparation of Annual Report	A
Preparation of Consolidated Statements	B
Financial Statement Analysis	B
Cost Accounting	I
Accounting for Taxes	I
Principles of Internal and External Audit	B
Accounting Consultation	B
Business Software	I
Budgeting	I

Source: Estonian Accounting Association

Expert Accountant Level

For the third level called “Expert Accountant” (or Accountant III) there is required five years of professional experience. The main tasks for adepts of this level are: (i) planning and managing of an accounting department of the company, (ii) representing the accounting department inside and outside the company, (iii) supervision and control of other employees, (iv) preparation of budgets and financial

statements, (v) cash flow management, and (v) to grant the effective usage of resources. That is why that adepts of this level have abilities to manage people and resources through orientation to results, plan and coordinate the financial activities of a company or any other organization, make financial decisions and analyze the financial position of a company.

What is quite interesting is the fact, that until now any exams of this level have taken place yet.

Table 8. Requirements on Expert Accountants

Main professional skills and knowledge	Level
General Knowledge	I
Business Economics	A
Statistics	A
Business Ethics	A
Communication Skills	A
Intellectual Skills	A
The Usage of Office and Network Systems	I
Working Environment	I
Accounting Knowledge:	
Accounting Terminology	A
Estonian Accounting Act	A
Legislation related to Accounting	A
Accountant's Professional Ethics	A
Principles of Organization of Accounting	A
Preparation and Preserve of Accounting Source Documents	A
Documentation of Business Transactions	A
Methods of Accounting	A
Principles of Financial Reporting	A
Preparation of Annual Report	A
Preparation of Consolidated Statements	I
Financial Statement Analysis	I
Cost Accounting	A
Management Accounting	B
Accounting for Taxes	A
Principles of Internal and External Audit	I
Preparation of Business Plans	B
Accounting Consultation	I
Business Software	I
Budgeting	A

Source: Estonian Accounting Association

Process of certification of bookkeepers and accountants started in 2004. 1261 people have so far taken the technician accountant professional examination, 1072 (85%) of which have successfully passed the examinations and received the professional certificate (see Table 9).

The exams can be considered rather successful. The performance rate has not dropped under 78%. Most of the first level participants have been last-year

undergraduate students for whose the exam is free of charge.

Table 9. Precision Ratio at the Exams of Technician Accountant Level

Term	Participants	Passed by	Rate
12/2004	34	31	91%
06/2005	192	182	95%
12/2005	23	21	91%
02/2006	22	22	100%
06/2006	224	202	90%
12/2006	40	32	80%
06/2007	202	163	81%
12/2007	60	47	78%
06/2008	155	122	79%
12/2008	47	40	85%
06/2009	234	188	80%
12/2009	28	22	79%
Total	1261	1072	85%

Source: Estonian Accounting Association

The exam "Accountant" which is focused on professional accountants is not such popular like "Technician Accountant" exam in Estonia. A total of nine examinations have been attended by only 106 people, 54 of those completed the exam successfully (see Table 10).

Table 10. Precision Ratio at the Exams of Accountant Level

Term	Participants	Passed by	Rate
05/2005	39	8	21%
11/2005	13	7	54%
05/2006	11	7	64%
11/2006	3	1	33%
05/2007	12	9	75%
11/2007	21	17	81%
06/2008	2	1	50%
06/2009	2	1	50%
12/2009	3	3	100%
Total	106	54	51%

Source: Estonian Accounting Association

However there shall be stated that not having a professional qualification in the labour market is completely irrelevant in Estonia at the moment. From the survey made almost 50 % of managers do not know anything about the accountant qualification levels and their content. There are 110 067 companies in Estonia, mostly small businesses. Entrepreneurs prefer to oblige the law as regarding the management of accounting and that with as less costs as possible, which means that a higher level of professional qualification certificate could not guarantee higher salaries. For this reason

professional accountants are aware that their employers are not willing to appreciate their knowledge and have any motivation to study this qualification scheme.

2.2.1 Certification of Auditors

Estonian Board of Auditors (EBA) was established in 1999 and the membership is based on Authorized Public Accountants Act. As well as in the Czech Republic the membership is obligatory to be able to act as an auditor.

Estonian Board of Auditors is a self-governing professional association of Estonian auditors, which organizes the professional activities of auditors and protects the rights of auditors. The bodies of the Estonian Board of Auditors are the general meeting, the management board and the audit committee.

Auditing rules include requirements for auditing and professional ethics based on the standards of the International Federation of Accountants with local adaptation. Supervision of the professional activities of auditors and compliance with the Auditing rules is in the authority of the Estonian Board of Auditors.

Currently there are 363 auditors in Estonia. Being a part of European Union, auditors receiving a license elsewhere in E.U. may practice their profession in Estonia after fulfilling the exam from current Estonian legislation.

Currently the auditor qualification scheme in Estonia comprises from following six exams (see Table 11):

Table 11. Auditor Qualification Scheme in Estonia

P1	Auditing
P2	Financial Accounting
P3	Management Accounting
P4	Taxation
P5	Corporate Finance
P6	Legal Bases for the Activity of Legal Persons

Source: www.auditorkogu.ee

2.3 International Schemes

There shall be mentioned at least following leading accounting certification scheme which are valid and run round the world: (i) ACCA, (ii) AIA, and (iii) CPA. All three systems are possible to study worldwide, so there may be seen students from Czech or Estonia. In the Czech Republic is very popular ACCA qualification scheme, Estonian accounting professionals prefer AIA qualification.

2.3.1 ACCA

Among the highly recognized accounting certification schemes belongs the scheme of the Association of Chartered Certified Accountants (ACCA). It is a British based professional body founded in 1904, which

provides accounting certification worldwide having more than 140 000 members in 170 countries.

Currently ACCA runs two level scheme consisting of fundamental and professional level. Within the fundamental level there might be applied certain exemptions from the exams, e.g. Czech accounting experts may receive this exemption for all nine papers of fundamental level and they need to pass just exams from professional level. The ACCA scheme has the following structure (see Table 12):

Table 12. ACCA Professional Scheme

Fundamental level	
F1	Accountant in Business
F2	Management Accounting
F3	Financial Accounting
F4	Corporate and Business Law
F5	Performance Management
F6	Taxation
F7	Financial Reporting
F8	Audit and Assurance
F9	Financial Management
Professional level	
P1	Professional Accountant
P2	International Corporate Reporting
P3	Business Analysis
P4*	Advanced Financial Management
P5*	Advanced Performance Management
P6*	Advanced Taxation
P7*	Advanced Audit and Assurance

Source: www.accaglobal.com

Within the professional level there is an obligation to pass papers P1-P3 and to pass two from papers P4-P7. A great competitive advance of ACCA is in the fact that the foreigners are able to pass their exams in their country (e.g. Czech adepts write their exams in Prague, Estonian in Tallinn). All exams are in written form and the required precision ratio is 50 %.

2.3.2 AIA

The Association of International Accountants (AIA) is another accounting certification provider based in the United Kingdom. AIA was founded in 1928 and nowadays has their members in more than 85 countries.

AIA runs three level scheme consisting of one foundation level and two professional levels (see Table 13):

Table 13. AIA Professional Scheme

Foundation level	
F1	Financial Accounting I
F2	Business Economics
F3	Management Accounting I

F4	Law
F5	Auditing and Taxation
F6	Information Processing
Professional level I	
P1	Auditing
P2	Company Law
P3	Management Information
P4	Business Management
P5	Financial Accounting II
P6	Management Accounting II
Professional level II	
P7	Financial Accounting III
P8	Financial Management
P9	Professional Practice
P10	Taxation and Tax Planning

Source: www.aiaworldwide.com

AIA (same like ACCA) provides an opportunity for foreigners to pass the exams in their country. All exams are in written form and the required precision ratio is 50 %.

2.3.3 CPA Australia

Certified Practising Accountants Australia (CPA) has been founded in Australia in 1952 from following bodies: Commonwealth Institute of Accountants (est 1886), Federal Institute of Accountants (est 1894). Its certification is well-known in Asia-Pacific area. CPA's system consists just from two levels (see Table 14):

Table 14. CPA Australia Professional Scheme

Mentor Program	
P1	Academia
P2	Auditing/Assurance
P3	Financial Accounting
P4	Financial Planning
P5	Information Technology
P6	Insolvency and Reconstruction
P7	Management Accounting
P8	Taxation
P9	Treasury/Financial Risk Management
CPA Status	
P10	Reporting and Professional Practice
P11	Corporate Governance and Accountability
P12	Business Strategy and Leadership

Source: www.cpaustralia.com.au

There shall be stated that this certification scheme is not widely known and spread within Central and Eastern Europe.

3 Research Design

An empirical analysis is performed on accounting qualification schemes for professional accountants. It involves closely analyzing the foresights of the national professional accounting certification schemes and global ones (ACCA, AIA, CPA Australia). The similarities and dissimilarities between the considered certification schemes are therefore determined.

The most frequently used methods in trade literature when analyzing the level of comparison between systems are Jaccards' association coefficients [7]. The Jaccard coefficient [3] is defined as the size of the intersection divided by the size of the union of the sample sets:

$$J(A,B) = \frac{|A \cap B|}{|A \cup B|} \quad (1)$$

The Jaccard distance is complementary to the Jaccard coefficient and measures the dissimilarities. It is obtained by dividing the difference of the sizes of the union and the intersection of two sets by the size of the union:

$$J_s(A,B) = 1 - J(A,B) = \frac{|A \cup B| - |A \cap B|}{|A \cup B|} \quad (2)$$

There was identified a series of elements regarding accounting exams which we then organized within three groups as follows: (i) exams within basic level; (ii) exams within specialized level; and (iii) professional experiences. The two considered coefficients offer the possibility of quantifying both the association degree and the dissimilarity degree between different sets of accounting certification schemes taken into consideration for analysis. So as to dimension the association or compatibility level, the calculation formula for the Jaccards' coefficients shows as follows:

$$S_{ij} = \frac{a}{a+b+c} \quad (3)$$

$$D_{ij} = \frac{b+c}{a+b+c} \quad (4)$$

where: S_{ij} represents the similarity degree between the two sets of analyzed accounting certification schemes; D_{ij} represents the degree of dissimilitude or diversity between the two sets of analyzed accounting certification schemes; a – the number of elements which take the 1 value for both sets of schemes; b – the number of elements which take the 1 value within the j -set of schemes and the 0 value for the i -set of schemes; c – the number of elements which take the 1 value within the i -set of regulations and the 0 value for the j -set of schemes.

To receive higher robustness of the results we have concluded the testing of similarities and dissimilarities using Roger-Tanimoto coefficient and Lance-Williams coefficient. The calculation formulas are following:

$$R\&T = \frac{d+a}{d+a+2(b+c)} \quad (5)$$

$$L\&W = \frac{b+c}{2a+b+c} \quad (6)$$

where: $R\&T$ represents Roger-Tanimoto coefficient (for measurement of the similarity level); $L\&W$ represents Lance-Williams coefficient (for measurement of dissimilarity level); and d represents the number of elements which take the 0 value for both sets of schemes.

4 Results

As mentioned before, there has been performed comparative analysis of accounting schemes and tested their compatibility. For measurement of similarities have been used Jaccard similarity coefficient and Roger-Tanimoto coefficient; for measurement of dissimilarities have been used Jaccard dissimilarity coefficient and Lance-Williams coefficients. Results are provided within Tables 15 and 16.

Table 15. Tests of Similarity

Scheme		CZE	EST	ACCA	AIA	CPA
CZE	JC	1.0000	0.6667	0.7333	0.9286	0.7333
	RT	1.0000	0.5238	0.6000	0.8824	0.6000
EST	JC	0.6667	1.0000	0.5333	0.6000	0.4375
	RT	0.5238	1.0000	0.3913	0.4545	0.2800
ACCA	JC	0.7333	0.5333	1.0000	0.7857	0.7143
	RT	0.6000	0.3913	1.0000	0.6842	0.6000
AIA	JC	0.9286	0.6000	0.7857	1.0000	0.7857
	RT	0.8824	0.4545	0.6842	1.0000	0.6842
CPA	JC	0.7333	0.4375	0.7143	0.7857	1.0000
	RT	0.6000	0.2800	0.6000	0.6842	1.0000

Source: own analysis

Table 16. Tests of Dissimilarity

Scheme		CZE	EST	ACCA	AIA	CPA
CZE	JC	0.0000	0.3333	0.2667	0.0714	0.2667
	LW	0.0000	0.2000	0.1538	0.0370	0.1538
EST	JC	0.3333	0.0000	0.4667	0.4000	0.5625
	LW	0.2000	0.0000	0.3043	0.2500	0.3913
ACCA	JC	0.2667	0.4667	0.0000	0.2143	0.2857
	LW	0.1538	0.3043	0.0000	0.1200	0.1667
AIA	JC	0.0714	0.4000	0.2143	0.0000	0.2143
	LW	0.0370	0.2500	0.1200	0.0000	0.1200
CPA	JC	0.2667	0.5625	0.2857	0.2143	0.0000
	LW	0.1538	0.3913	0.1667	0.1200	0.0000

Source: own analysis

From the presented analysis could be seen, that there is a high level of compatibility of Czech accounting certification scheme with international ones. As a closest scheme might be considered AIA professional scheme (comparable for 92.86 % using Jaccard coefficient, resp.

88.24 % using Roger-Tanimoto coefficient), which is less popular than ACCA in the Czech Republic. Czech scheme and AIA scheme are moreover the closest from the performed analysis.

The closest certification scheme to the Estonian one is Czech accounting certification scheme (66.67 % compatibility using Jaccard coefficient, resp. 52.38 % using Roger-Tanimoto coefficient).

High level of compatibility could be also seen between British schemes (ACCA and AIA).

5 Conclusion

There should be stated that the professional qualification is not requested by labor market. That's why that only about 10 % of all professional accountants in the Czech Republic and Estonia are certificate holders. As a biggest advantage of Czech certification scheme shall be stated the basement on ACCA professional scheme and the compatibility with the certification scheme for external auditors. On the other hand in Estonia any of levels is equal to auditors' certification system and there are provided any exemptions for professional accountants.

Professional accounting certification schemes in the Czech Republic and Estonia need to be more promoted to the whole accounting profession as well as to employers.

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Appendix – Data Source for Statistical Analysis

Paper	CZE	ACCA	AIA	CPA	EE
Accounting I	☺	☺	☺	☺	☺
Law	☺	☺	☺	☹	☺
Statistics	☺	☹	☹	☹	☺
ICT	☺	☹	☺	☺	☺
Economics	☺	☹	☺	☹	☺
Taxation	☺	☺	☺	☺	☺
Ethics	☺	☺	☺	☺	☺
Finance	☺	☺	☺	☺	☺
Managerial Accounting	☺	☺	☺	☺	☺
IFRS	☺	☺	☺	☺	☹
Financial Management	☺	☺	☺	☺	☹
Management	☺	☺	☺	☺	☹
Auditing	☺	☺	☺	☺	☹
Performance Management	☹	☺	☹	☹	☺
Financial Reporting	☺	☺	☺	☺	☺
Insolvency and Reconstruction	☹	☹	☹	☺	☹