



Research Assessment Exercise

Report 2023

International evaluation of research
at the University of Vaasa



Vaasan yliopisto
UNIVERSITY OF VAASA

Research Assessment Exercise – Report 2023 – International evaluation of research
at the University of Vaasa

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1 Foreword

GREETINGS FROM THE RECTOR OF UNIVERSITY OF VAASA

In our 2030 strategy, the University of Vaasa strives to become an internationally recognised research university. The approach is highlighted by multidisciplinary research with strong disciplinary knowledge to support solving important global challenges. Our research activities are characterised by academic excellence, team science, corporate world relevance, and impact on the ecosystem. We carry out ethical research that is open, responsible, and sustainable.

Impact on the society, diversity, meaningfulness, and focus on future were important features in our design of this third research evaluation. It aimed to assess the research activities and the quality of research performance with regard to the international level of research in its fields. The most important and the primary goal of the research evaluation was that we sought guidance from international experts and their peer-review for future research strategy in order to grow and strengthen the university's impact in its areas of excellence, and still maintain and support all areas needed in our path to becoming an internationally recognized research university. In addition to international feedback, the evaluation aimed to provide the university and the research faculty an opportunity for self-reflection on their research activities. The sixteen research groups formed the basic units of evaluation (2015–2020). The evaluation of the four schools and the three platforms focused on the years 2018–2020 since the university's current organisational structure was established in the year 2018.

The external evaluators' reports differ in style and length, but the school-based panels prepared thorough reports on each unit's research. The reports will give the units significant support for the further development of their research activities and environment. This evaluation will guide us on our path towards becoming a university internationally recognised for the high-impact of its research. In the process, we will be active in society and in our ecosystem, co-operating with companies and stakeholders, working actively with leading international and domestic research and education networks, and in value enhancing partnerships. Science is conducted by people and bright minds. Our success will be built together, with our talented and dedicated employees, with our young bright minds – our students – and with our ecosystem partners.

I wish to thank the University Panel Chair, Professor Heikki Mannila. Your strong academic experience and deep knowledge of all cornerstones of academic research

for building a strong research environment has really taught us a lot. My warm thanks also go to the highly valuable and appreciated international experts in the school-based panels who gave their thorough reports: Professor Agnes Cheng (Chair), Professor Lawrence Kryzanowski, Professor Mikko Puhakka, Professor Seppo Villa; Professor Anne Kovalainen (Chair), Professor Christopher Fox, Professor Bruno van Pottelsberghe, Professor Markku Sotarauta; Professor Ulf Andersson (Chair), Professor Mika Pantzar, Professor Anu Sivunen; Professor Anders Christiansen Erlandsson, Professor Johan Frishammar, Professor R Carter Hill and Professor Kaushik Rajashekara. Your work has been really valuable to us and to our university. In particular, I wish to thank D.Sc. Virpi Juppo and D.Ed. Marja-Liisa Hassi for their endless and knowledgeable work in keeping all of the different parts together and building the whole research assessment exercise. Important support for the RAE process was also provided by the Research Council, the University Services and Tritonia Academic Library with Director Anne Lehto.

Finally, I want to thank all our personnel for their hard work and excellent results in research as reported in the experts' assessments. Excellent cooperation with the deans, platform leaders and research group leaders also led to a successful RAE process. We continue to advance the implementation, effectiveness, and influence of our research by disseminating new and relevant knowledge in our educational programmes, partner networks, and society.

Minna Martikainen
Rector, University of Vaasa
24.1.2023

2 Executive Summary

The University of Vaasa is a business-oriented and multidisciplinary science university established in 1968. The university's strategy focuses on three areas of research: management and change, finance and economic decision-making, and energy and sustainable development. It highlights multidisciplinary research with strong disciplinary knowledge integrated through research platforms to support solving important global challenges. The core mission is to advance new knowledge and to "Energise Business and Society." The University of Vaasa has a core faculty of 584 and 5,203 students with 190 international students and 296 PhD students. International accreditations, unique research infrastructure, and partnerships with global businesses and organisations make the University of Vaasa a trusted and valued partner within both regional and international innovation ecosystems.

The Universities Act (Section 87. Evaluation (Amendment 1302/2013)) stipulates that universities must evaluate their research activities. In line with the strategy of the University of Vaasa, the university evaluates its research activities every five years in order to strengthen the quality of the research internationally, to advance academic and societal impacts of the research, and to further develop the research activities and environment. The previous research evaluations were carried out in 2010 and in 2015. This third research evaluation covered research activities from 2015 to 2020. Diversity, meaningfulness, and focus on future were important features of the research assessment exercise (RAE). The RAE was carried out as a multilevel and multidimensional evaluation targeting research environment, research cooperation and funding, publications, and scientific activities including societal impact. In addition to research groups and the university as a whole, it focused on schools and platforms. The evaluation material and the expert panels' interviews thus covered three different levels of the university organisation.

A Steering Committee consisting of members of the Research Council of the University of Vaasa (2021–2023) was nominated to support and guide the research evaluation. The RAE Univaasa 2022 followed practices of responsible evaluation. Engagement of the research units and researchers was an important aspect of the evaluation process. The evaluation team designed, organised, and implemented the different phases of the RAE in collaboration with the heads of the schools, platforms, and research group leaders. All evaluated units got basic summaries of their research output and bibliometric reports before preparing their self-evaluation reports. The material and the bibliometric reports aimed to provide the units tools for self-reflection and further development of their research. In addition to the CWTS analysis prepared by Leiden University, SciVal analyses on Scopus publications were performed for each unit by the Tritonia Academic Library. Bibliometric analyses also included results from AI-analysis of the themes of open access publications (OSUVA, 2018–2021).

The external evaluation was performed by five panels of independent scientific experts. Four of the panels were discipline-specific (based on the school's disciplines). These school-based panels were asked to provide written comments by comparing each research group's research to the international and national level of research in the respective field. Based on the research group level evaluations, each school-based panel was asked to offer an overall assessment of the school's research activities and quality of research. A separate team of the panellists were responsible for the assessment of the three research platforms. The University Panel, consisting of the panel chair and the chairs of the school-based panels, was asked to provide an integrating evaluation of the quality of research activities and environment at the University of Vaasa and to offer recommendations for how the university should develop its research. The results of the assessment and the expert panels' reports and recommendations will have an effect on the strategic development of research within the university from 2023 onwards.

Evaluation indicated that several research groups are currently at a high international level. The areas represented in Vaasa are ones where excellent researchers have many possibilities. The societal impact of research and the industrial cooperation with regional businesses and also the wider interaction with the society work very well at the University of Vaasa. The flexibility of the cooperation seems to be far greater than in many other universities. Many of the projects contribute clearly to the research and the education of the university and provide useful information for the companies the research groups partner with. However, building international research capacity will remain challenging. This is partly a product of the size of the University and the research groups, most of which are relatively small and rely on a small number of high performing professors.

The international experts gave several recommendations on how to improve the quality of research at the University of Vaasa. Externally funded projects that support the university's aim to become an international research university should be encouraged. The strategy will be augmented with more concrete goals on the research focus, quality, and volume. The implementation plan should specify at some level what would be the areas, or modes of operation, in which the university wants to excel, and how this excellence is going to be measured. Recruitment should be prioritised based on the strategy of the university and the availability of excellent people. The university also should consider using international Professors of Practice and inviting more international Visiting Professorships. Moreover, increased possibilities for faculty and PhD students to engage in international activities could boost production of top-level research.

The panels also assessed the role of the evaluated units and the internal cooperation within the university. The research groups vary a lot in their size, but also in their cohesion. The panellists saw that in terms of organisation, some groups were tight clusters, while other groups did not seem to have a clear structure. They considered that it would be very useful if each researcher would have an intellectual home base at the university. The panellists perceived the relationship between research groups and platforms to be unclear. The model was considered complicated relative to the size of

the schools and the university. The panellists suggested developing further the role and form of the platforms. In particular, the panellists suggested that in relation to the service of schools and their research groups, the platforms should have a supporting role, instead of trying to form research identities of their own. However, the panellists also considered that there is no definite need to have all the platforms operate in the same way.

3 University of Vaasa in Brief



The University of Vaasa (Univaasa) is a business-oriented and multidisciplinary science university. Since the establishment of the School of Economics and Business Administration in Vaasa in 1968, the University of Vaasa has developed into a multidisciplinary and international university as a result of long-term work. The core competence of the University of Vaasa consists of high-level expertise in business, technology, management, and communications. The university hosts one of the largest internationally accredited business schools of higher education in Finland. Its strategy focuses on three areas of research: management and change, finance and economic decision-making, and energy and sustainable development. The university conducts impactful research of a high international standard and educates highly skilled experts that address the needs of modern society, today and in the future.



VISION

The University of Vaasa is regarded internationally as a successful and impactful research university.



MISSION

We carry out impactful research and educate experts that address the needs of society today, and in the future. We advance competitiveness, innovation and sustainable development in business, technology and society.



VALUES

Courage
Community
Responsibility

The University of Vaasa’s core values are courage, community, and responsibility. It is an international community where working culture and community are based on equality and non-discrimination. The University of Vaasa aims to advance competitiveness, innovation, and sustainable development in business, technology, and society. The core mission is to advance new knowledge and to “Energise Business and Society.” The university’s ambition in research is to reach a high international level with “high impact” by the year 2030. It aims to build a reputation as a highly-valued partner within both regional and international innovation ecosystems. This approach enhances the scholarly excellence in its fields of academic research and also strengthens the societal impact of the research.

The highest decision-making body of the University of Vaasa is the board which is appointed by the university collegium. The board chooses a rector who leads the operations of the university. The rector is supported in their tasks by the management team. The international scientific board supports the university in its strategy execution. At the beginning of 2018, the University of Vaasa was reorganised into four schools for research and teaching: the School of Management, the School of Accounting and Finance, the School of Marketing and Communication, and the School of Technology and Innovations.

The university also strengthened its operations with three multidisciplinary research platforms. The platforms advance multi-, cross-, and inter-disciplinary research to help address complex challenges facing the society. Vaasa Energy Business Innovation Centre VEBIC strives to meet the global needs of energy production, energy business, and sustainable social development. Digital Economy examines the innovations made possible by new technologies and their impact on individuals, organisations, industry, and society as a whole from the perspective of different sciences. Innovation and Entrepreneurship InnoLab explores open innovation, user innovation, public sector reform and entrepreneurship.

Board			
Rector			
Schools	Research platforms	Affiliated institutions	University services
Management	VEBIC	Language Centre Linginno	
Marketing & Communication	Digital Economy	Tritonia Library	
Accounting & Finance	InnoLab	Executive Education	
Technology & Innovations			

Figure 1. University structure.

The University of Vaasa has a core faculty of 584 and 5,203 students with 190 international students and 296 PhD students included. The annual operating costs were approximately €43,7 million in 2021. The University is located at the heart of Northern Europe's largest energy and environment business cluster. It currently operates in three cities in Finland: Vaasa, Seinäjoki, and Kokkola. International accreditations, unique research infrastructure, and partnerships with global businesses and organisations make the University of Vaasa a trusted and valued partner within both regional and international innovation ecosystems.

Personnel

584 
 of which **103**
 international 

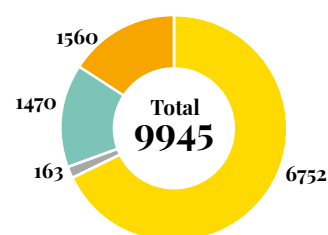
External research funding



- Other external research funding
3,412,578 €
- Other competitive research funding
3,305,061 €
- International competitive research funding
764,020 €

Total 764,020 €

Applications 2021



- Bachelor's programmes
- Master's programmes in Finnish
- Master's programmes in English
- Open University

University of Vaasa cooperates with companies, communities, and other universities as well as research institutions. Research cooperation in the university is done in the academic schools, the research platforms, the research groups, and the affiliated institutions as well as by individual researchers.

2020	School of Accounting and Finance	School of Management	School of Marketing and Communication	School of Technology and Innovations	University total*
FTE professors (full)	10.2	13.0	9.6	15.6	51.4
FTE all personell	47.1	65.8	50.2	107.0	497.7
Nuber of students	1223	1520	1103	1298	5143
Degrees	309	320	274	223	1126
Doctoral students (intake)	8	18	8	18	52
Degrees	3	7	2	8	20
Publications total for 2018–2022	268	413	291	587	1581
Total funding	3 684 901	4 469 079	3 417 830	6 392 705	43 114 744
External funding	573 801	1 205 653	926 024	2 629 589	8 404 632

Table 1. Key figures for the University of Vaasa by schools in 2020 (publications 2018–2020).

The most significant research infrastructures of the university are Technobothnia’s 25 laboratories, VEBIC energy laboratories, and the Tritonia academic library.

Technobothnia	VEBIC – Energy Laboratories	Tritonia Academic Library
Technobothnia is a wide ranged laboratory unit co-owned by three universities, the University of Vaasa, Vaasa University of Applied Sciences and Novia University of Applied Sciences.	University of Vaasa VEBIC research platform has a laboratory complex that includes three laboratories: a combustion engine laboratory, a fuel laboratory and a smart grid laboratory FREESI.	Tritonia Academic Library is the common library and learning centre of four universities / universities of applied sciences.

Table 2. Significant research infrastructure of the University of Vaasa.

University of Vaasa has recently been placed in several rankings which provide important information about the strengths of the university. In particular, the strengths of the University of Vaasa include the number of scientific publications, the number of citations to scientific articles (that is, impact of publications), and international co-publications.

Times Higher Education (THE) World University Rankings 2022:
351–400

Times Higher Education (THE) Young University Rankings 2022:
70th

The Shanghai Global **Ranking of Academic Subjects (GRAS) 2022:**
Top 200 in Business Administration
Top 500 in Management

THE World University Rankings 2022 by subject: **Business and economics**
201–250



4 Assessment Goals, Subjects, and Process

The Universities Act (Section 87. Evaluation (Amendment 1302/2013)) stipulates that universities must evaluate their research activities. In line with the strategy of the University of Vaasa, the university evaluates its research activities every five years in order to strengthen the quality of the research internationally, to advance academic and societal impacts of the research, and to further develop the research activities and environment. The previous research evaluations were carried out in 2010 and in 2015. The first evaluation covered the years 2005–2014 and looked at the quality of the university's research, doctoral training, organisation, and societal impact. The second evaluation, carried out in 2015, focused on the years 2010–2014, and in particular on research teams. The evaluation found that the university had a very strong societal impact and cooperation with regional businesses. In order to develop the research activities and to further strengthen the quality of research, the Research Assessment Exercise was conducted in 2021 and 2022. This third research evaluation covered research activities from 2015 to 2020.

The phases and aims of the RAE Univaasa 2022 followed practices of responsible evaluation. In accordance with the principles of the SCOPE model,¹ it emphasised context, different options, and methods for evaluating, and also deep and multidimensional evaluation. The RAE Univaasa 2022 also applied the guidelines of the Finnish Advisory Board on Research Integrity for responsible conduct of research² as well as the principles of DORA declaration³ in the assessment. Engagement of the research units and researchers was an important part of the evaluation process. The evaluation team also offered regular presentations and information sessions for the researchers and leaders of the units.

The design of the RAE Univaasa 2022 was prepared in collaboration with the heads of the schools and the platforms (through the Steering Committee). The evaluation team also gathered feedback from the heads of the academic units and the leaders of the research groups at later stages of the assessment. In addition to external peer-review of research quality and environment, all research units were engaged in internal evaluation of their research activities, impacts, and environment. Moreover, all researchers were asked to assess (anonymously) the quality of the research environment and services at the university.

4.1 ASSESSMENT GOALS

The third research evaluation aimed to develop research activities and to further strengthen the quality of research at the University of Vaasa. Diversity, meaningfulness, and focus on future were important features of the Research Assessment Exercise.

¹ <https://inorms.net/scope-framework-for-research-evaluation/>

² <https://www.tenk.fi/en>

³ <https://sfdora.org>

The RAE Univaasa 2022 had the following goals:

- To evaluate the research activities and the quality of research performance with regard to the international level of research in the field;
- To evaluate the academic and societal impacts of the research activities;
- To provide the university and research faculty an opportunity for self-reflection and international feedback on research activities;
- To offer guidance for future research strategy and development of research environment

The results of the assessment and the expert panels' reports and recommendations will have an effect on the strategic development of research within the university from 2023 onwards.

4.2 ASSESSMENT SUBJECTS, DOMAINS AND CRITERIA

Research groups were the main target of the research assessment. In addition to the university and the sixteen research groups, the assessment included the four schools and the three platforms established in 2018. Consequently, the evaluation material of the RAE Univaasa 2022 and the expert panels' interviews covered three different levels of the university organisation.

Evaluated units of the research groups are listed in Table 3.

School of Accounting and Finance	ACA	Auditing and Control in Accounting
	FRG	Finance and Financial Accounting
	BLI	Business Law and Information
	ERG	Economics Research Group
School of Management	HRM	Human Resource Management
	SBD	Strategic Business Development
	PPO	Public Policy and Organisations (new: Administrative Science)
	CRG	Complexity Research Group
School of Marketing and Communication	IBMS	International Business and Marketing Strategies
	MCR	Consumption Research and Customer Value Creation (new: Marketing and Consumption Research)
	CS	Communication Studies
School of Technology and Innovations	NeVS	Networked Value Systems
	SES	Smart Electric Systems
	RE	Renewable Energy
	MS	Mathematics and Statistics Research Group
	SCR	SC Research

Table 3. Research groups of the RAE Univaasa 2022.

The RAE Univaasa 2022 consisted of both:

- A. *external* evaluation of research quality and environment offered by expert panellists
- B. and *internal* evaluations conducted by the schools, platforms, research groups, and researchers.

The evaluation documents and criteria focused on three main domains: 1) basic data and analyses on *research outputs*, 2) units' *self-reports on research activities*, and 3) basic data and self-reports on *research environment*. Table 4 presents the domains, evaluated units and criteria of the RAE Univaasa 2022.

Research Assessment Exercise at Univaasa		
RESEARCH OUTPUTS	SELF-REPORTS ON RESEARCH ACTIVITIES	RESEARCH ENVIRONMENT
Schools, Platforms, Research groups	Schools, Platforms, Research groups	University, Schools, Platforms, Research groups, Researchers
Amount, type, and quality of publications	Strategy, focus areas, and aims of research	Data on infrastructure and research personnel
Amount and type of external funding	Important expert assignments, collaboration, and academic research activities	Self-report on organisation and leadership in research
Amount and type of research projects including collaboration	Self-assessment of research output and activities	Self-report on researcher training, support, and career development
Amount and type of scientific activities	Important non-academic activities	Data and self-report on advancement of research methods provided in teaching and research
Number of doctoral students and doctorates (schools)	Self-assessment of societal impacts of research	Self-assessment of the research environment
	Plans and needs for future research activities	Results from the Researcher Survey on research environment
	Impact Case report (platforms, research groups)	

Table 4. Evaluation framework of the RAE Univaasa 2022.

The school-based panels' assessment was based on the evaluation documents and information provided during the small-group interviews with the units' leaders and researchers. For each academic unit (i.e., school or platform) and research group, the main evaluation documents consisted of:

- A. Self-evaluation reports including Impact Case;
- B. Summaries of basic data and statistics on research output;
- C. Bibliometric reports.

Results from the Researcher Survey supplemented assessment of the quality of the research environment and services at the university and in the evaluated units. Types and sources of data for the assessment are elaborated in Appendix C.

The University Panel was asked to provide an integrating evaluation of the quality of research activities and environment at the University of Vaasa and to offer recommendations for how the university should develop its research. The University Panel was asked to address the following questions:

- A. How well the evaluated units' strategic objectives of research had been achieved so far?
- B. What were the evaluated units' strengths and weaknesses in their fields of research?
- C. How well had the university succeeded in its multidisciplinary research activities so far (strengths and weaknesses)?
- D. What were the overall strengths and weaknesses in the university's research activities achieved from future perspective?
- E. What were its general recommendations and suggestions for the University of Vaasa in developing the quality and quantity of research?

In addition, for enhancing the quality of research at the University of Vaasa, the University Panel was asked to assess the university's provision of training in *research methods* and offer recommendations for further development of researchers' methodological skills.

For each research group, the *school-based panels* were asked to provide written comments by comparing its research to the international and national level of research in the respective field. The criteria and guiding questions in the assessment focused on:

- A. Quality of research activities (publications, projects, collaboration);
- B. Academic and non-academic impact of the research;
- C. Research profile and strategy (scientific relevance, originality);
- D. Quality of research environment (resources, internationalisation, leadership);
- E. Future research prospects and recommendations.

Based on the research group level evaluations, each school-based panel was asked to offer an overall assessment of the *school's* research activities and quality of research. The criteria followed the same composition as in the research groups' assessment. In the assessment of the schools, the expert panellists were asked to comment on the quality and impact of research, the collaboration and networking in research, the research focus areas, and the quality of research environment. They were also asked to offer recommendations for the future development of research at the school.

The panels assessed the research and offered recommendations at each school based on:

- A. the academic unit's self-evaluation report;
- B. assessment of the research groups' research at the academic unit; and
- C. the summaries of the school's basic data and statistics on research output and activities.

Due to the unique and different position, a different approach was applied in the assessment of the three *research platforms*. A separate Team consisting of the Chair of the University Panel and two school-based panellists was asked to comment on each platform's focus areas and aims, the strategy and achievement in external research funding, the collaboration and public outreach activities in research, and the quality of societal impact of research.

The Team assessed the platforms' research activities and offered recommendations based on:

- A. the platform's self-evaluation reports including Impact Case; and
- B. the summaries of the platform's basic data and statistics on research output and activities.

Instead of the numerical rating applied in the previous research evaluation (2015) of the university, the panels were asked to provide written reviews of the research groups, schools, research platforms, and the university with a focus on the quality of research activities, of the impact of research, and of the research environment followed by recommendations for future.

4.3 EVALUATION PROCESS

For each evaluated unit, *the first phase* was to gather basic data and statistics (2015/2018–2020) on researchers and research output. In addition to research personnel, these included compilations of achieved external funding and research projects, and publications and expert assignments recorded in the university's SoleCRIS database. At first, each research group was asked to review a list of its core researchers

and associated researchers based on the university's databases. All units also reviewed and commented on the self-report templates (Self-Evaluation Report, Impact Case).

After the reviews, the evaluation team conducted basic statistical analyses and prepared data summaries for each research group. Bibliometric analyses and reports were conducted by the Tritonia Academic Library and the evaluation team (*Scopus* database, *SciVal*) and by the University of Leiden (*Web of Science* database). Separate compilations of research output and reports on bibliometric analyses were prepared for the academic units of the four schools and three platforms, and for the university as a whole.

AI-analyses of research themes in the publications of the university, schools, and research groups (2015–2021) were performed by HeadAI Oy to reflect publication output against the university's strategy and UN Sustainable Development Goal 9 (SDG 9 - Innovation). Results were shared in a PowerPoint presentation and as a report including links to the units' interactive thematic map. The maps provided the units with a tool for development of their research.

Each evaluated unit received the results from bibliometric analyses and basic statistics on research output. In addition, the evaluation team provided results from a *Researcher Survey* that gathered researchers' views and assessment of the research environment and research related services at the university and academic units.

In the *second phase*, the schools, platforms, and research groups prepared a *Self-Evaluation Report* according to guidelines. The Self-Evaluation Reports provided supplementary information of the units' research activities and academic/non-academic impacts of research. The units were also asked to review and critically self-assess their research output and environment. Research platforms and research groups were also asked to submit an *Impact Case* report as to their societal research activities. The units also assessed their case according to a rating scale presented in Appendix D.

The *third phase* of the RAE Univaasa 2022 consisted of the expert panellists' desk work on the evaluation material shared in the OwnCloud platform. Site visit and small-group interviews with the heads and researchers of each unit at the University of Vaasa was the *fourth phase* of the assessment. The panels' hybrid interviews with the evaluated units was arranged at the university in November 2022. During the interviews, the panels were able to specify and expand their knowledge of the research activities in the university with the help of researchers representing the various phases of a researcher's career. The evaluation team arranged information sessions for all panel members and the Panel Chairs had an orientation meeting with the representatives of the University of Vaasa before the site visit and interviews. The *final phase* consisted of writing assessment reports on the evaluated units.

Timetable of the research assessment exercise is presented in Appendix B.

4.4 COMPOSITION OF THE EXPERT PANELS

The external evaluation was performed by *five panels of independent scientific experts*. The evaluation team asked the research units for suggestions on field-specific experts to serve in the panels of the RAE Univaasa 2022. In addition to positions and scientific fields of the proposed panellists, also brief justifications for the proposals were requested. The candidates were assessed for potential conflicts of interest. The Steering Committee discussed the proposals and appointed the sixteen scientific experts to the school-based panels. The positions and affiliations of the expert panellists are presented in Appendix A.

Four of the panels were discipline-specific (based on the school's disciplines) and each of them assessed the research groups of the specific school. The panels consisted of three to five panellists and a chair. The panels also assessed the school's research based on the research groups' evaluation and the school level data and reports. The *school-based panels* were also asked to assess the research platforms when related to their disciplines. One member of each panel was asked to chair the panel. The Panel Chair was responsible for supervising the panel's progress and for organising the panel's work.

The fifth panel was called the *University Panel* and it was chaired by the University Panel Chair. The other members of the University Panel were the chairs of the school-based panels. A *separate team* consisting of the Chair of the University Panel and two school-based panellists were responsible for the assessment of the three research platforms.

The University Panel Chair was responsible for the commensurability of the panels' peer reviews. The University Panel was responsible for providing a university level evaluation. The panels, members and panel chairs are listed in Figure 2.

Panel 1: School of Management	Panel 2: School of Accounting and Finance	Panel 3: School of Marketing and Communication	Panel 4: School of Technology and Innovations
Chair, Anne Kovalainen Christopher Fox Bruno van Pottelsberghe Markku Sotarauta	Chair, Agnes Cheng Lawrence Kryzanowski Mikko Puhakka Seppo Villa	Chair, Ulf Andersson Mika Pantzar Anu Sivunen	Chair, Heikki Mannila Anders Christiansen Erlandsson Johan Frishammar R Carter Hill Kaushik Rajashekara

University Panel – Evaluation of the University of Vaasa	Platform evaluation team
Chair, Heikki Mannila Ulf Andersson, chair Agnes Cheng, chair R Carter Hill Anne Kovalainen, chair	Chair, Heikki Mannila Anders Christiansen Erlandsson Bruno van Pottelsberghe

Figure 2. The panels, members and panel chairs in the RAE Univaasa 2022.

A non-disclosure statement was a part of the agreement with the panellists and the University of Vaasa. The panel member undertook not to make use of and not to divulge to third parties any non-public facts, information, knowledge, documents, or other matters communicated to him/her or brought to his/her attention during the evaluation. The reviews were agreed to be confidential until publication of the final evaluation report.

4.5 ORGANISATION OF THE RAE UNIVAASA 2022

Based on the Rector's decision on 12th of March 2021, a Steering Committee was nominated to support and guide the research evaluation. The committee consisted of members of the Research Council of the University of Vaasa (2021–2023):

- Chair, vice-rector for research, Professor Minna Martikainen
- Director, vice-rector Martin Mayer
- Dean Marko Järvenpää
- Dean Raine Hermans (previously Harry Linnarinne)
- Dean Arto Rajala (previously Pirjo Laaksonen)
- Dean Adam Smale
- Director Professor Heidi Kuusniemi
- Director Suvi Karirinne
- Professor Sami Vähämaa (previously Timo Rothovius)
- Professor Harri Jalonen
- Professor Hannu Laaksonen
- Professor Tero Vartiainen (previously Tommi Sottinen)
- Professor Arto Ojala
- Associate professor Henna Syrjälä
- Doctoral student Laura Urrila
- Student Laura Karppinen (previously Lauri Tuohiniemi)

The Steering Committee was responsible together with the evaluation team for the preparation of the Terms of Reference, setting up the units and targets of evaluation, the criteria for evaluation, the structure and composition of the international expert panels, the structure and content of the data to be provided to the panels, and the budget and timetable of the research assessment exercise. The committee oversaw the evaluation process and addressed other issues in the preparation of the research assessment.

The Evaluation Team

The research assessment exercise was coordinated by the Evaluation Team consisting of:

- Vice-Rector for Research, Professor Minna Martikainen
- Head of Research Services and Graduate School, D.Sc. (Admin.) Virpi Juppo
- Evaluation Specialist, D.Ed., M.Sc. Marja-Liisa Hassi, Research Services and Graduate School

Under the supervision of the Steering Committee, the evaluation team designed the implementation, self-reports, and assessment templates of the RAE 2022. It compiled the evaluation data and documents, conducted basic analyses and summaries of the data, prepared results of the survey on research environment, and organised the site visit and the hybrid interviews conducted by the international expert panels. In order to gather feedback from the evaluated units, the team also offered regular information sessions on the RAE activities for the leaders and researchers of the units.

The bibliometric analyses and reports were prepared by Tritonia Academic Library of the University of Vaasa and by Leiden University (CWTS B.V., Centre for Science and Technology Studies). CWTS analysis of the publications on the Web of Science (WoS) database was conducted by Mark Neijssel and Carole De Bordes. The personnel of the Tritonia Academic Library organised with the evaluation team the university's publications (SoleCRIS, OSUVA) for bibliometric analyses and AI-analysis of the themes of publications. They also prepared the reports on the Scopus database publications by using the SciVal analysis tool.

Tritonia Academic Library

- Director, Anne Lehto
- Head of Services, Heidi Troberg
- Information Specialist, Hanna Erkinheimo
- Information Specialist, Niina Sorvari

The RAE Univaasa 2022 was conducted with the help of University Services specialists. HR unit compiled data on research personnel, Finance and Project Administration unit's specialists provided data on the research projects and external funding and also helped in organising the panels' site visit. Specialists of the Research Services and Graduate School offered continuous help at different stages of the RAE including data compilation and the panels' site visit.

The RAE Univaasa 2022 was funded by the University of Vaasa.

5 University Level Evaluation

Panel members: Heikki Mannila, Ulf Andersson, Agnes Cheng, Anne Kovalainen, R Carter Hill

5.1 INTRODUCTION

The joint *University Panel* consisting of a chair and the school-specific panels' chairs was asked to provide an *integrating evaluation of the quality of research activities and environment* at the University of Vaasa, with recommendations for the further development of its research. In addition to university level material and interviews with the university management representatives, peer reviews of the schools, platforms and research groups were made available to the University Panel. Some of the reviews provided additional recommendations for the university as a whole.

The research assessment exercise had the following main objectives:

- A. to evaluate the research activities and the quality of research performance with regard to the international level of research in the field;
- B. to evaluate the academic and societal impacts of the research;
- C. to provide the university and research faculty an opportunity for self-reflection and international feedback on research activities;
- D. and to offer guidance for future research strategy and development of research environment.

The evaluation concentrated on the research activities and their scientific and societal impacts. The educational activities of the University of Vaasa were out of the scope of the evaluation, including only the relationship of research and education. Research groups were the main focus of the evaluation.

The context, aims, and structure of the research assessment exercise differed from the previous research evaluation in 2015. In addition to the university and the sixteen research groups, the preliminary materials covered also the seven academic units (four schools and three platforms) established in 2018. Instead of the numerical rating applied in 2015, the panels were asked to provide written reviews of the research in the academic units, research groups, and the university with a focus on the quality of research activities, of the impact of research, and of the research environment followed by recommendations for future.

The central materials for the evaluation included the interviews with the schools, research platforms, and research groups: they provided a wealth of information about the research and its quality and impact. The preliminary materials included very useful self-evaluation reports from the schools, platforms, and research groups, and also the impact case descriptions provided by the groups and platforms. These qualitative data were supported by compiled information and basic statistics on research personnel, doctoral degrees, external research funding, publications, and scientific activities. In addition, reports of the bibliometric analysis of Scopus publications (SciVal) and Web of Science publications (CWTS) by Leiden university were provided. Results from a researcher survey provided additional information on the research environment and services at the university.

The university panel wishes to thank the university for a careful preparation of the materials, and for an excellent organisation of the assessment exercise.

5.2 ORGANISATION OF THE UNIVERSITY

The University of Vaasa has four schools for research and teaching: the School of Management, the School of Accounting and Finance, the School of Marketing and Communication, and the School of Technology and Innovations.

The School of Management carries out research in the fields of business studies and administrative sciences including human resource management, strategic management, public law and public management, regional studies, and social and health management. The School of Accounting and Finance has four subject areas: finance, accounting, economics, and business law. The School of Marketing and Communication focuses on international business, marketing, and communication. The School of Technology and Innovations carries out research in various areas including mathematics, electrical engineering and energy technology, information systems and automation technology, and industrial management.

In addition to the schools, there are also three multidisciplinary research platforms: Vaasa Energy Business Innovation Centre VEBIC; platform on Digital Economy; and Innovation and Entrepreneurship Innolab platform.

Schools			
SCHOOL OF MANAGEMENT	SCHOOL OF ACCOUNTING AND FINANCE	SCHOOL OF MARKETING AND COMMUNICATION	SCHOOL OF TECHNOLOGY AND INNOVATIONS
Regional Studies	Accounting	International Business	Mathematics
Human Resource Management	Financing	Marketing	Electrical Engineering and Energy Technology
Public Management	Business Law	Communication	Information Systems
Public Law	Economics		Science and Automation Technology
Social and Health Management			Industrial Management
Strategic Management			
RESEARCH PLATFORMS			
Vaasa Energy Business Innovation Centre VEBIC			
Digital Economy			
Innovation and Entrepreneurship Innolab			

Figure 3. Schools, platforms and scientific fields of the University of Vaasa.

During the evaluation period there have been major changes in the organisation of the University of Vaasa. In the fall of 2017, the education and research in languages was moved from the University of Vaasa to the University of Jyväskylä. At about the same time, in the beginning of 2018, the organisation of the University of Vaasa was changed: the previous three faculties were replaced by four current schools. Simultaneously, the three platforms were created to foster interdisciplinary research and interaction with the society.

The panels of the research assessment exercise heard very few references to the previous faculties of the university, which can perhaps be interpreted as meaning that the transition has been successful, at least from the point of view of the areas that remained in Vaasa. The platforms, on the other hand, are a young organisational form, and they seem to be in a formative stage, based on the intensive discussion on them during the interviews.

Currently, a reorganisation of the facilities is ongoing at the University. Buildings at the campus are being renovated and the university has plans for relocating the academic units and its services for future needs.

5.3 PERSONNEL OF THE UNIVERSITY

For the research evaluation, the university presented 16 research groups, with three to five research groups per school. The groups are, as far as the panel understood, not administrative units; rather, they represent groups of researchers with interconnected research themes. The groups seem to vary a lot: some are organisationally tight clusters, with different types of group activities, while others do not seem to have any existence outside the research evaluation.

The group sizes vary quite a lot. Table 5 shows the person years according to career stages⁴ from 2020 for each school and group, and Figure 4 shows the total person years against person years in senior categories for each group.

	4th stage	3rd stage	2nd stage	1st stage	Other	Total	% of university
School of Technology and Innovations							
NeVS	3.2	2.1	3.6	5.5	0.0	14.4	6%
MS	3.0	3.0	1.0	1.6	0.0	8.6	3%
RE	4.0	4.7	2.0	13.2	3.7	27.6	11%
SCR	1.2	1.5	3.0	1.0	0.0	6.7	3%
SES	9.0	5.3	8.3	11.2	2.6	36.4	15%
Sum of all groups	20.4	16.6	17.9	32.5	6.3	93.7	38%
School of Accounting and Finance							
ACA	3.2	4.0	4.0	3.0	0.0	14.2	6%
BLI	2.0	1.4	1.8	1.0	0.0	6.2	2%
ERG	2.0	2.0	3.0	3.3	0.3	10.6	4%
FRG	3.1	2.0	4.8	5.6	0.1	15.6	6%
Sum of all groups	10.3	9.4	13.6	12.9	0.4	46.6	19%
School of Management							
CRG	1.9	0.0	0.0	0.0	0.8	2.7	1%
HRM	5.0	2.7	5.4	6.1	3.0	22.2	9%
PPO	4.8	8.4	5.8	5.9	1.2	20.9	8%
SBD	3.2	6.0	3.9	4.3	0.4	17.8	7%
Sum of all groups	14.9	17.1	15.1	16.3	5.4	63.6	26%
School of Marketing and Communication							
CS	1.5	3.8	4.5	4.9	0.5	15.2	6%
IBMS	3.1	2.0	4.0	4.8	0.5	14.4	6%
MCR	5.2	5.4	3.5	7.0	1.8	22.9	9%
Sum of all groups	9.8	11.2	12.0	16.7	2.8	52.5	21%
University total	53.2	51.3	49.6	64.7	33.2	249.4	100%⁵

Table 5. The person years of the research groups of the University of Vaasa in 2020.

⁴ Stage 4: professor, research director; stage 3: associate professor, senior researcher, lecturer; stage 2: assistant professor, postdoc, university teacher; stage 1: doctoral or project researcher; other: project manager, laboratory engineer, research assistant

⁵ Note: The sum total of the percentages exceeds the university total 100% due to the overlapping personnel across the groups.

Personnel by RGs – Total vs. 3. and 4. stage researchers

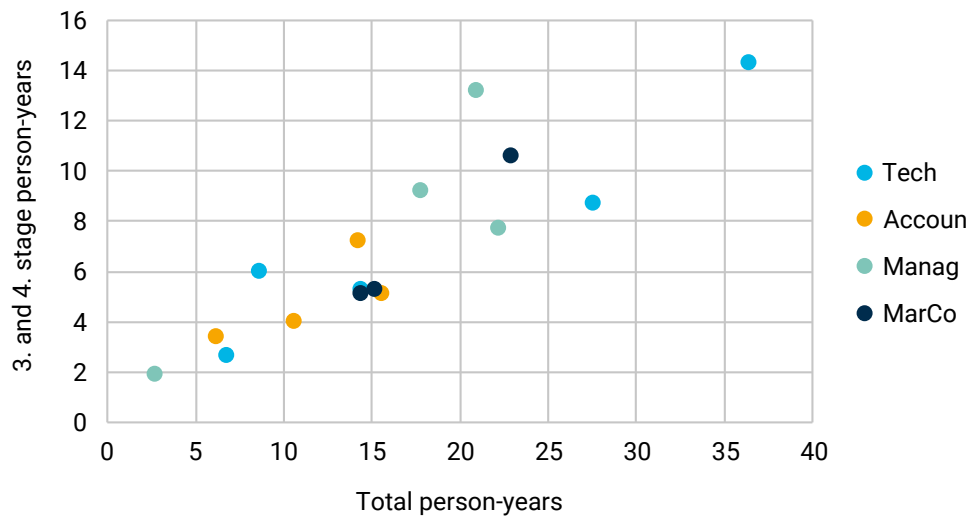


Figure 4. The total person-years and the 3. and 4. stage person-years of the research groups in 2020.

Many of the groups are small. Out of the 16 research groups, one half had less than six person-years in the senior career stages 3 and 4, and a clear majority had less than 3.5 person-years in career stage 4 (professors). This means that most of the research groups are fragile in the sense that even a single change in the senior personnel can have a major effect on the group.

At the other end of the seniority spectrum, there are many groups that had very few stage 1 personnel. This implies that these groups had even fewer doctoral students. The few senior persons and few doctoral students probably makes doctoral studies quite hard in those groups.

5.4 FUNDING OF THE UNIVERSITY

University of Vaasa is one of the 13 universities in Finland. The universities in Finland receive their basic funding from the Ministry of Education and Culture. The level of the basic funding of universities comes to each university as a lump sum, and the decisions on how to use it are done in the universities. The funding is determined by using an outcome-based model, with 11 different types of outcomes falling into two main categories: education and research. The University of Vaasa receives about 2.0% of the national basic funding.

The funding percentage for the University of Vaasa from different outcomes is skewed: the share of the university is 3.0% of the funding allocated on the basis of bachelor's degrees, but 1.0% of the funding allocated on the basis of publications. For the four research outcomes, the percentage of the University of Vaasa of the total national funding is 0.5–1.3%.

Thus, the University of Vaasa gets most of its funding from the educational outcomes. Out of the funding allocated based on the 11 outcomes, the University of Vaasa receives 79% of its funding from the seven educational outcomes; overall, these seven outcomes correspond to 55% of the funding allocated on the basis of the 11 outcomes.

About 50% of the research done in universities is funded by the direct funding from the ministry, the rest comes from various external funding sources: Academy of Finland, Business Finland, the European Union, companies, and foundations. The University of Vaasa receives external funding €6.3 million in 2020. The profile of the university is strongly focused on education.

5.5 PUBLICATIONS OF THE UNIVERSITY

Table 6 shows the total number of Scopus publications from the University of Vaasa and the citation indices for the schools and research groups for the years 2015–2020.⁶ The subject areas of Scopus publications are illustrated in Appendix E.

	Publications	% of all publications	Total citations	FWCI	Top 10 publications	Top 10 (%) ⁷
School of Technology and Innovations						
NeVS	304	20%	4830	1.69	65	21%
MS	89	6%	995	1.47	16	18%
RE	114	8%	1808	1.04	15	13%
SCR	28	2%	324	1.80	7	25%
SES	256	17%	3202	1.81	60	23%
School	740	49%	10637	1.63	155	21%
School of Accounting and Finance						
ACA	42	3%	512	1.24	4	10%
BLI	19	1%	17	0.32	1	5%
ERG	30	2%	431	1.19	3	10%
FRG	126	8%	1732	1.53	21	17%
School	214	14%	2722	1.32	28	13%
School of Management						
CRG	9	1%	60	0.87	0	0%
HRM	101	7%	1522	2.10	28	28%
PPO	38	3%	150	0.57	1	3%
SBD	154	10%	4854	3.20	59	38%
School	292	19%	6599	2.48	86	29%
School of Marketing and Communication						
CS	28	2%	69	0.55	1	4%
IBMS	99	7%	1449	1.36	17	17%
MCR	139	9%	2436	1.38	22	16%
School	259	17%	3758	1.27	37	14%
University						
	1507⁸	100%	22916	1.62	292	19%

Table 6. Results of the SciVal analysis on the Scopus publications of University of Vaasa (2015–2020).

We first point out that there is a considerable variation between research fields in the publication and citation practices. Hence, one should not put too much weight on these data. However, they give an overview of the scientific activities of each organisational unit.

⁶ Bibliometric analysis on Web of Science database (CWTS) by Leiden University covered publications only in 2015–2019 with no articles in edited books. The number of the listed publications was 821. As the counts in publications were small for many groups, further analysis focused on nine groups only (with 534 publications). Indicators of the WoS publications are presented in Appendix E.

⁷ Publications: total number of publications in the SciVal analysis; % of publications of all publications: percentage of the publications of the unit of all publications of the University of Vaasa; Total citations: number of citations to the publications; FWCI: field-weighted citation index, with world average in the research field being 1,0; Top 10: number of publications that are among the most cited 10 % of publications in their field; Top 10 index: the percentage Top 10 publications.

⁸ The university's total number of publications is not equal to the sum over groups as some publications are included in the numbers for more than one group.

The number of publications from the groups varies from nine to 304. Three schools have 200–300 publications, while the school of Technology and Innovations has more than 700 publications.

Overall, the citation indices, both FWCI and Top 10 index, are above the world average. There is considerable variation between groups, but all the schools achieve at least the world average.

For many groups the number of publications is quite small, so there is a lot of inherent uncertainty in citation counts and values of the citation indices. A rule of thumb is that one should not look at citation indices when the number of publications is under 100.

There is also a considerable variation from year to year, and hence assessing results from a six-year period of 2015–2020 is preferable to studying yearly numbers. There are mild positive correlations between the group size and the bibliometric indicators, but given the above, these associations should not be considered as strong evidence.

5.6 MAIN OBSERVATIONS AND RECOMMENDATIONS FOR THE UNIVERSITY

5.6.1 Strategy and its implementation

The strategy states that the vision for the University of Vaasa is to be “*internationally recognised as a high-impact research university*”. Given the current profile of the university, this is an ambitious goal: as stated earlier, the University of Vaasa has a stronger presence in university education than in research. Several groups in the university are currently at a high international level, but there is considerable variation within the university.

Reaching the vision of the strategy is not easy. One necessary step is to make the goal more concrete. Thus, we suggest that the strategy is augmented with **more concrete goals on the research focus, quality, and volume**. Also, the implementation plan should specify at some level what would be the areas, or modes of operation, in which the university wants to excel, and how is this excellence going to be measured.

We note that, for example, bibliometric indicators are typically too coarse and backward-looking to provide sufficient data for university management. Specifically they are not suited as sole measures used for decisions inside the university. We have seen this in this research assessment exercise: the bibliometric data about research groups is useful, but only when used in combination with in-depth analysis of self-evaluation reports and the data obtained through interviews.

The shortcoming of research evaluations as tools for strategy implementation is that such evaluations tend to concentrate on performance at on a single time interval and they thus lack the detailed data to evaluate the effects of strategy implementation steps. We therefore suggest that in addition to the research assessment exercises, the university should consider a **more continuous review of research**, perhaps based on the scientific board of the university.⁹

5.6.2 Focus areas

None of the Finnish universities can excel in all subareas of large research fields. Continuing the theme of strategy implementation, we note that given the small size of the university, the University of Vaasa cannot achieve high international impact in very many areas. Even though small groups or individuals can do excellent work, sustained activity of high quality typically requires larger groups. Thus, the university will have to make **choices on the areas in which it is going to concentrate on**. Such choices can be made implicitly or explicitly. The current strategy does not really indicate the areas of research in the which the university focuses its activities, although it states that the university is "... *productive and specialised research university*". An important step in the strategy implementation is to make this more concrete.

The results of the evaluation show that there are several strong research groups in the University of Vaasa. There is, however, quite a lot of variation between the groups. Thus, the university faces the typical problem in university management: how to support the best groups so that they can become even better, while at the same time also taking into account the groups which currently are not as strong.

When looking at the strong research groups in the University of Vaasa we noticed that several of them are based on one or two key individuals. This means that the groups are quite fragile: small changes in the personnel can lead to large changes in the operations of the group.

We feel that the university should have a long-term plan of development of its key areas, combining bottom-up and top-down approaches.

5.6.3 Recruiting

The most important decisions done at a university are the recruiting of faculty, staff, and students. Especially recruiting of professors are crucial for the future research. Based on the interviews the leadership of the university, the deans, and research group leaders recognise this. Still, it seemed that there is no strategic program for recruiting personnel.

⁹ Scientific Board | University of Vaasa (www.uvasa.fi/en/university/organisation-and-management/scientific-board)

We recommend that the university establishes such a programme, which would cover the whole university, the possible focus areas, and **prioritise recruitments based on the strategy of the university and the availability of excellent people**. A long-term plan can bring needed flexibility for recruiting: when an excellent person on a key area is available, the university should be able to use this possibility, even if the recruitment for that area had originally been planned for a later time.

The scientific areas represented in the University of Vaasa are ones where excellent researchers have many opportunities, and hence the university needs to be **efficient in articulating and capitalising on the strong points** of the university and the research community.

As an example, during the interviews it was mentioned several times that the University of Vaasa should recruit researchers in data analysis and machine learning. Indeed, these areas are very useful and even necessary for developing many of the fields in the university. However, attracting high-quality talent in those areas requires a job description that would combine the strong points of the University of Vaasa with a clear commitment on developing these scientific areas.

Several interviewees pointed out the possibilities of hiring more visiting professors. It seems that this type of arrangement could be effective in providing access to more senior people, and in that way helping considerably in, for example, Ph.D. education.

5.6.4 Industrial cooperation and interaction with the society

The industrial cooperation and also the wider interaction with the society work very well at the University of Vaasa. The procedures seem to be flexible and the communications between the parties are frequent and pragmatic. Many of the projects contribute clearly to the research and the education of the university and provide useful information for the companies. The flexibility of the cooperation seems to be far greater than in many other universities.

As the cooperation works well, we are hesitant to offer any large changes to the way it is handled. The interviews and the written material provide some points, however, where further improvement could be possible.

Many of the cooperation projects we saw were an excellent fit to the existing strong research groups at the University of Vaasa. At the same time there seems to some projects, mostly funded by EU structural funds, where the goal and usefulness of the project for the research and education of the university are not very clear.

These projects serve, of course, as ways of obtaining additional funding for the research groups. Such funding is useful for maintaining the externally funded personnel, but the academic goals and the goals for societal impact could perhaps be more ambitious. In

that way the university and the surrounding society could benefit more from the projects. We suggest that the university would aim to improve the strategic usefulness of these projects. The panel also found that **a systematic approach to obtaining external funding could be useful.**

5.6.5 Research methods

While the research assessment exercise did not cover educational aspects, the evaluation touched to some degree also research methods and their role in the curricula. The growing role of data in research implies that for high-quality research a strong foundation on methods, both qualitative and quantitative, is needed.

Teaching in research methods can be organised either separately in methods courses or in an integrated way, inside the courses of the subject domain. As the University of Vaasa is a small university, it does not seem very easy to organise a large collection of methods courses. Thus, an integrated approach might be better suited in this case. It could also be a good way of using the university's small resources in mathematics, statistics, and data analysis. To avoid the dispersion of method teaching in research training, similarly also qualitative methods teaching benefits from pooling the resources and integrating their teaching more explicitly. The main recommendation is that **the research methods should have a strong position in doctoral education and also in master's programmes.**

5.6.6 University structure

As noted above, the research groups vary a lot in their size, but also in their cohesion. Some are organisationally tight clusters, with different types of group activities, while others do not seem to have any existence outside the research evaluation.

We feel that for the purposes of high-impact research and good PhD. education it would be very useful if **each researcher in the university would have an intellectual home base at the university.** This would be useful even in the case when a researcher does most of the collaborations with people working outside the University of Vaasa.

The university currently has four schools, and the areas of three of them are ones that are typically seen inside a business university. There was some discussion during the interviews whether it would be useful to merge these three schools. This would, however, lead to a structure with only two schools, and with a split of 62%–38% of the personnel, and the panel did not see many advantages in such a merger.

The panel received the impression that fairly many of the management positions (vice-rectors and deans) are full-time. Given the size of the university, and the scarcity of senior professors, it could be useful to think of how necessary this is.

6 School of Management

Panel members: Anne Kovalainen, Christopher Fox, Markku Sotarauta, Bruno van Pottelsberghe

Each school-based panel gave an overall evaluation of its school's research activities and quality of research based also on the research group evaluations. The evaluation criteria followed the same composition and standards as in the research group evaluation.

The University of Vaasa transformed its structure in 2018 from having three discipline-based faculties to four multi-disciplinary schools. The School of Management consists of the former Department of Management and four subject areas of administrative sciences.

The School of Management is small by international standards. In 2020, the school's budget was approx. €4.4 million. External funding was €1.12 million in 2020 and had risen in recent years with a small proportion of external funding coming from international sources.

The School of Management has FTE 65.8 academic staff and 13 professors. The school's student body numbers 1,520 and it produces 320 degrees through seven degree routes. The annual intake of new students to the doctoral programme is 18, and altogether, the school has 93 registered doctoral students (in 2020). Approx. seven doctorates finalise their doctoral degree annually, which is 35% of the annual doctoral degrees at the University level.

The school comprises four research groups – two grounded in business studies (Strategic Business Development; Human Resource Management), and two grounded in administrative sciences (currently Administrative Sciences, during evaluation period titled as Public Policy and Organisations; Complexity). Their focus is as follows:

- Human Resource Management (HRM) – people management issues within organisations across the private and public sector; global mobility and international HRM; employee wellbeing
- Strategic Business Development (SBD) – servitisation, business networks, business models
- Public Policy and Organisations (PPO) – public policies, interactive governance, and governance innovation as well as public sector ethics and law
- Complexity Research (CRG) – wicked problems, complexity studies, deliberative welfare models, management challenges in social and healthcare sector

6.1 RESEARCH FOCUS AREAS

The broad quantity and quality of the research groups' output is heterogeneous, and soundly rooted in the history of the school. This heterogeneity is observed with both the input (number of researchers, funding) and the relative output (publication and quality weighted by size or number of professors).

6.2 QUALITY OF RESEARCH ACTIVITIES AND IMPACT OF RESEARCH

The aggregate research output, and the evidence on its qualitative impact, confirm that the Vaasa School of Management is research-based, with an active research output. Over recent years, the school has improved research activity and quality in administrative sciences via key appointments, the creation of two research groups, and the strengthening of research leadership.

When considered in relative terms (e.g., with the number of full-time professors), the number and quality of scientific papers are in line with average international standards. Over the past six years (2015–2020), the School of Management has published in total 879 publications, of which 531 are JUFO-publications. 260 of the JUFO-publications were published between 2018 and 2020. The FTE academic staff was 62.2 FTE during 2018–2020. The School of Management had approximately 25 visitors and externally funded researchers per year during 2018–2020.

The citation analysis shows that of the publications published in the School of Management, 16% were published in the top 10% most cited publications worldwide. The bibliometric evidence further suggest that research output is stable in terms of quantity and quality. The field-weighted citation impact is 2.48, 29.5% of publications are in the most cited publications worldwide and 53.8% of publications are international collaborations (these have a much higher field-weighted citation impact (3.39)). The average number of citations per paper is rather low, which witnessed a classical skewed distribution of top-quality papers frequently observed in research departments.

However, this high quality of publications does not seem to be reflected in the Administrative Sciences Research Group and the Complexity Research Group data.

The main challenges for the School of Management identified by the review team are as follows:

- Renewal of research agenda. There is a challenge for research leaders to renew research agendas given the small size of research groups and for some groups, the diversity of groups.

- Career development. Research groups often have to rely on home grown talent, but that raises challenges for recruiting students, creating more diverse research groups and providing career development opportunities. The University has introduced tenure track posts. This is part of the solution, but not the whole solution. How do professors create opportunities for junior staff career development?
- Building international research capacity will remain challenging. This is partly a product of the size of the university and the research groups, most of which are relatively small. Research groups tend to be over-reliant on a small number of high performing professors.
- The unclear relationship between research groups and platforms. This model seems overly complicated relative to the size of the school and the university. Research groups sometimes struggle to leverage cooperation with the research platforms, particularly in relation to external high quality funding bid development. The disciplinary core and field are important for bidding, particularly for Academy of Finland, HorizonEurope, and ERC funding and the platforms do not 'map' to these fields directly. The balance between rigour (disciplines) and relevance (platforms) is difficult to achieve.
- Post-award support is lacking. There is also a perception within research groups about a lack of pre-award support, some of which is available from platforms, but can be difficult to access. There is budgeting support available.
- External funding has allowed research groups to move part of their teaching to post-doctoral researchers and concentrate more on research bidding and publications. Changes in the external research funding landscape have however, meant fewer opportunities and more competition, especially within business studies.
- Trying to achieve consensus around research goals and activities in a diverse, multi-disciplinary school is a challenge.

Some of these challenges were identified by the school in its self-evaluation report and by the Dean in his presentation to the evaluation team.

6.3 QUALITY OF RESEARCH ENVIRONMENT

The evaluation panel has identified the following themes/issues related to the quality of research environment at the School of Management.

Research groups are seen as key to research success. The research groups are led by research-oriented professors, and sometimes with co-leads who are not professors. All Doctoral students belong to a research group. Research groups have been recently reviewed and restructured with a greater focus on strategic clarity and stronger leadership. Because some of the groups are relatively new and small, it is difficult to be confident of whether recent successes can be sustained or built upon. For some groups, the governance structure seems to be top-heavy.

There have been retirements and staff turnover in some areas (e.g., Administrative Sciences/Public Policy and Organisations). There has been recent investment in research e.g., with appointments of five faculty members to the new research-oriented tenure track path, the appointment of two research directors, and the planned appointment of the first Professors of Practice.

There is a general recognition that research support services are insufficient, particularly for post-award services. There is debate about whether or not pre-award support is sufficient and whether it is located in the right places. Research groups all felt they would benefit from pre-award support being more closely aligned with research groups. However, some research groups were in clear need for such support, due to several successful group activities.

Collaboration between research groups and across the University is reported to be somewhat limited and uneven, even if good examples exist. Funding has been won for some multi-disciplinary research projects, but multi-disciplinary research is perceived as demanding.

Work around public outreach and research utilisation seems uneven and there is debate about what 'impact' of the school's research looks like. The school is moving towards the UK model of 'research impact' with an emphasis on longitudinal impact case studies at the level of individual researchers or small groups of researchers.

There is little focus on building research infrastructures (increasingly important in areas such as Big Data/machine learning, longitudinal data, or complex modelling). This might be primarily a role for platforms, although we are suggesting reviewing the role and form of platforms (see below).

Internationalisation of research is uneven. Most research is still funded by regional/national funders, and subject to fluctuation.

6.4 RECOMMENDATIONS FOR FUTURE RESEARCH

While these recommendations are for the School of Management, we recognise that some also apply to the whole University:

Teaching load: The allocation of research time, relative to teaching is generous, by international comparison, for most staff in most research groups, and this should be maintained.

International mobility: Given the above average quality of publications authored with international teams of co-authors, the School of Management should consider offering funding for and strongly recommend PhD researchers to spend four to six months research stay abroad. Professors should actively search for the best universities for PhD researchers to visit. This will encourage closer collaboration with leading international research groups.

Internationalisation of research: We recognise that international recruitment is challenging. More use should be made of international Professors of Practice and more international Visiting Professorships should be established and invited.

Relationship between Research Groups and Platforms: Given the small size of the School of Management we question the model whereby researchers work across research groups and platforms. Currently, the platforms do not create a complete matrix structure, meaning that sometimes research groups are not supported for bidding for projects that fall outside of the remit of the platforms. Given scarce resources our recommendation is that platforms should serve research groups and not form their own research identity. Tenure track should not automatically be linked to a platform. Tenure track staff should choose to be linked to a platform, not required to be part of a platform. This would take the structure closer to a matrix model.

Size of Research Groups: The principle is that research groups must be of a certain size to be viable, e.g., X number of Professors, X research income, X doctoral students, and that principle should be a general model for research group formation, in order for research groups to be able to compete for national and international funding, and to be internationally recognised as possible research partners and benchmarks. Smaller research groups should either be amalgamated with other research groups or designated as 'emerging research groups' and their development reviewed regularly.

Benchmarking: Two of the research groups are better established and more successful (Strategic Business Development Research Group and the Human Resources Management Research Group). The school should celebrate the success of these research groups and more clearly articulate what makes them successful. These benchmarks will be helpful for emerging research groups and other schools.

Research support: There is a general recognition that research support services are insufficient, particularly for post-award services. Post-award support should be increased. Pre-award support should be aligned more closely with research groups to ensure that all research bidding opportunities can be pursued.

Impact beyond academia: We support the school's move towards the UK model of 'research impact' with an emphasis on longitudinal impact case studies at the level of individual researchers or small groups of researchers. As impact case studies are created more use should be made of them in public outreach and research marketing.

6.5 RESEARCH GROUP EVALUATIONS

6.5.1 Human Resource Management Research Group

The Human Resource Management (HRM) Research Group is one of the four research groupgroups (Human Resource Management, Strategic Business Development, Administrative Sciences (formerly Public Policy and Organisations), and Complexity Research) at the School of Management, University of Vaasa. Research topics focus on people management issues within organisations across the private and public sector; global mobility and international HRM; employee wellbeing. HRM has been active both in education and in research at UVA for a very long time.

The HRM Research Group is the largest of the School of Management Research Groups. It consists of 22 members, of which 13 (60% of research groups) are senior faculty members (professors, research directors, senior researchers, etc.). The research group has five doctoral researcher positions, and 1.7 research assistants and other assisting persons in 2020. In addition, the research group had five scholarship researchers and two with other funding in 2020. The overall number of faculty has slightly grown during the period 2015–2020, especially in the senior positions.

The research group is also the largest research group in the field of HRM and leadership among Finnish Universities' HRM research units. The research group has a long history of high-quality publications and is truly advancing 'global standards' in the field. The research themes (international HRM, strategic HRM, Leadership) are well defined and coherent, and have a clear objective to contribute to three main challenges of our society: globalisation, sustainability, and future of work. With five full time professors, the unit is large for an HR research group, and highly productive. The research areas within the group complement each other. The important publications are co-authored with international scholars, in high quality journals. And the research output is not 'only' academic, as witnessed by strong interaction with the industry, and with European research funding. The research group has developed linkages to its external stakeholders.

6.5.1.1 *Research profile and strategy*

The HRM Research Group addresses three areas in HRM research: Strategic HRM, International HRM, and Leadership. The HRM Intelligence lists the practices, principles, and ways of conducting research (values, methods, significance) and relates more to mission of the unit, and not to subject topics.

Each of the three areas includes four focus or specialisation areas. These areas range from Strategic role of HRM, HRM, and performance, Managing employee wellbeing and

work-life interface to Leadership in complex working life situations and organisations, Supportive leadership behaviours (e.g., managerial coaching) and to dyadic relationships, to mention a few. The team presented a useful slide suggesting three priorities that were slightly different from those presented in the paperwork. Many of the research areas with the HRM Research Group are close to each other, complementing and most probably creating co-publication possibilities.

During the evaluation period the HRM Research Group had on average 16.7 FTE members, and of these, 43% are senior members. Some of the focus areas give the impression of being more research topics rather than wider focus/specialisation areas for a larger group. Perhaps working titles for focus areas need to be consolidated, or developed further, in order for them to be more general by nature.

The research group has altogether five doctoral researcher positions, and 1.7 research assistants and other assisting persons. In addition, the research group had on average 10 researchers with other external funding annually during the evaluation period. The number of externally funded researchers is volatile and depends on the available external funding.

6.5.1.2 Quality of research activities and impact of research

Comparing the two periods, 2015–2017 and 2018–2020, a clear trend to publish in higher classified journals (JUFO2 and JUFO3) is visible during 2018–2020 and this reflects a conscious strategy of the research group. In 2015–2017 18%, and in 2018–2020 30% of all publications were published in JUFO2. In 2015–2017 15%, and in 2018–2020 20% of the publications were published in JUFO3. The highest AJG level targeting is used when suitable (e.g., leadership publications).

From 2015 to 2020, the research group produced 197 publications in total, of which 29% were in JUFO2 and JUFO3 categories. The level of publishing is at good and at a reasonable level, given the aim for quality publications, and they include collaborative publications. With regards to quality, the research group is very explicit in its aim to publish in highest JUFO outlets and AJG4-level journals, and has succeeded well in its endeavours.

During 2015–2020, the HRM Research Group has been successful in gaining external research projects, and often with highly competitive funding (Academy of Finland) with mixture of more practice oriented, yet impactful funding (Business Finland). The outlined target for the research group is to aim toward increasing international, for example, European, funding. It seems that all these external projects funded through highly competitive funding are significant, and the research group seems to have avoided the 'money-driven' research interest development, but rather, has aimed for research-based and curiosity-driven research, with excellent results, when measured with the most valued external funding.

6.5.1.3 Quality of research environment

The research group has established several strategic and beneficial collaborative connections both nationally and internationally. The international university relations have supported the development of successful and highly competitive research projects. The research group has won both national and international external funding. The research group mentions three such projects in the self-evaluation report: two Academy of Finland-funded and one Horizon Europe funded projects which all fall into the core areas of the research group. It is evident that the research group has developed a high-quality research environment, and is able to deliver high quality research work both nationally and internationally.

The report and the interview emphasised the benchmarking of one University Centre to which the research group aims to develop closer connections (University of Gothenburg, Centre for Global HRM, Sweden) in the close future, showing the continuous strive for new opening within the research group.

6.5.1.4 Future research prospects and recommendations

Continuity: The research group is well-established, generating research income, and producing high-quality publications. They have built both rigour and relevance in their research over time. The next challenge might be in the identification and recruitment of the next generation of research leaders.

6.5.1.5 Suggestions to the University of Vaasa and to the school

The shared suggestions are detailed in point 1.5 above. Especially in relation to the HRM Research Group, the School of Management should celebrate the success of this research group and more clearly articulate what makes this group so successful. This benchmarking will be helpful for emerging research groups and other schools.

6.5.2 Strategic Business Development Research Group

The Strategic Business Development Research Group is one of the four research groups (Human Resource Management, Strategic Business Development, Administrative Sciences (formerly Public Policy and Organisations), and Complexity Research) at the School of Management, University of Vaasa. Research topics focus on servitisation and strategic change-related research questions in businesses at large.

During the evaluation period the Strategic Business Development Research Group had on average 14.1 FTE academic staff, consisting of 2.7 FTE professors, 3.7 associate

professors, senior researchers, and university lecturers, 2.9 second tier positions, and on average 3.4 doctoral students. The SBD Research Group had on average 1.5 other research personnel. The number of externally funded researchers has been three to four annually.

The Strategic Business Development (SBD) Research Group has functioned for a relatively long time as a research team/group, even if it was only 'formally' formed after a split of the previous larger NEVS Research Group in 2019. When compared to the previous evaluation, this split has been successful, when measured by the output and publication profiles. The target of the research group is to specialise in strategic change-related research questions in companies, and connected to that, researchers have also worked in close connection to companies.

6.5.2.1 Research profile and strategy

The research group addresses the servitisation research and defines its key topics as: Servitisation towards sustainable smart product-service systems, business model & service innovation, Networks, strategic alliances and ecosystems and Strategic change, strategy work and processes. The research profile areas are well defined and seem concentrate around servitisation, making the research group unique within its area. This, combined with high quality research, makes the group very efficient in the delivery of high-quality scientific publications and teaching services.

The research group has a well-defined research strategy and international collaboration partners and benchmarks, thought-through competencies, processes and customer value-thinking in their education and outreach activities. The targets are specified in terms of graduated students, scientific impact (JUFO/AJG), societal influence, and external funding. All targets are set by the research group and additional development targets are set on extending the impacts of projects.

Development areas are related to research fields (such as visiting professors, development of double degrees, and improvement of digitisation of all courses). The group holds a leading position and profile in sustainable smart product-service systems. This institutional trajectory and a sound organisation explain the ambitious strategy of the research group. In five years, the research group wants to become the leading research group on servitisation towards sustainable smart product-services systems. They have a well-defined set of universities as benchmarks (e.g., Aston Business School, Linköping University, St. Gallen) with which the team already collaborates. On the teaching side, the research group aims at creating a double degree at MSc level, and increase the team from four to six core professors, and doubling the research group size by 2028. Strategy discusses the importance of societal impact.

6.5.2.2 Quality of research activities and impact of research

The Strategic Business Development Research Group is further specialised in several complementary subfields, including strategic change of companies, digital servitisation, platforms, ecosystems, and sustainability. The group relies on various research methodologies and has developed its expertise in these fields, from state of the art to case studies and quantitative empirical analyses. Due to limited external funding and major changes in its availability for business studies, including funding from industry, the group has strategically decided to focus on high quality research with the clear objectives of publications in top journals, to maximise their strategic impact in academia, and to gain international visibility and recognition. In that work, the research group has taken up research in new fields such as Strategy-As-Practice, which complements the profile and widens the methodological approaches cultivated within the group.

The selected scientific papers for the review, and the overall view of the published material during the evaluation period are published in international peer review journals, ranging in quality between good and very good. These scientific journals are mostly specialised and range within a second tier in terms of quality or stringency. However, both the research themes and the results is clear evidence of a serious research orientation and an ability to develop original and impactful research. The publication track record is worth mentioning, although quality can probably be strengthened even more (convergence towards JUFO2 and JUFO3, and top AJGs), even if this would come at the cost of a reduced number of articles being accepted by publications per annum. The research group has published 295 publications during the evaluation period, and of these, 99 (33.6%) are in categories of JUFO2 and JUFO3. Despite a focus on scientific research, the whole team seems well engaged in society, collaborating effectively with corporate partners and academic partners at the international level.

The research areas of the research group range from the strategic change of companies, with an emphasis on technology companies, Digital servitisation, platforms, and ecosystems (including value systems and networks, and Sustainability (including sustainable energy transition, among others). The themes complement each other, which is important in a research group working with several strategically chosen topics, and thus has potential to increase the impact of research, not only scientifically, but also societally.

6.5.2.3 Quality of research environment

The research group as a whole has been successful in dedicating about 70% of its time to research, thanks to standardised teaching methods and intense collaboration. This was made in order to have more time for the publishing work. The research group relies on external funding to recruit post-doctoral positions, who are delivering one course at least. In the Master's programmes, very specialised courses are based on their research activity, and the courses are smartly scaled and adjustable to many needs and levels of teaching.

The group enjoys a strong international collaboration for publications, involving international networks and postdocs. Overall, the research group has claimed a strong support from the university over the past 15 years, but this support is not enough to develop an internationally competitive research group. They need more investment to support administrative tasks for project development. They are building and managing some projects with the platforms, which help to build industrial consortia, a quite time-consuming task, as platforms have very little structural support or staff (33% FTE per platform).

6.5.2.4 Future research prospects and recommendations

Building resilience: We wonder if the Strategic Business Development Research Group has streamlined their research strategy already too much. Adopting quite a narrow focus for the research group (servitisation towards sustainable smart product-services systems) could leave the research group vulnerable to loss of key academic staff and changing trends in research funding. To address this challenge, we suggest more diversity in its research profile and more collaborative work with the platforms and technology-focused research groups.

The group relies on data collection with industry to foster collaboration with them, which in turn leads to opportunities to generate further data collection and external research funding.

6.5.2.5 Suggestions to the University of Vaasa and to the school

The shared suggestions are detailed in point 1.5 above. Especially for the Strategic Business Development Research Group, the School of Management should recognise in addition to the success of this research group, and more clearly investigate the possible pitfalls of further growth, in order to alleviate them. This benchmarking will be helpful for emerging research group and other schools.

We further suggest that other research groups look to implement a similar model of data collection with industry, to foster collaboration with them, in their respective research areas. The School of Management should celebrate this model that helps to foster the impact beyond academia.

6.5.3 Administrative Sciences Research Group formerly Public Policy and Organisations

The Administrative Sciences Research Group is one of the four research groups (Human Resource Management, Strategic Business Development, Administrative Sciences, and Complexity Research) at the School of Management, University of Vaasa.

At the time of the evaluation period the research group consisted of FTE 5.5 professors, 7.6 career stage 3 posts (assistant professors, senior research fellows, university lecturers), 3.2 post-doc researchers and university teachers, and four full-time doctoral students. The number of reported publications, 360, is based on larger number of researchers than the average FTE shows. Of the 360 reported publications over the period of 2015–2020, 50 (13.8%) are JUF02 and JUF03 publications.

The Administrative Sciences Research Group is a new formation. The earlier, larger research group was split into two. Disciplines of Public Management, Regional Studies and Public Law continued as the PPO group. In 2021 the group was renamed as Administrative Sciences Research Group.

Research topics cover public management, public law, health management, and regional studies. All subjects within the research group have separate focus areas. The fields of Administrative Sciences at Vaasa University are diverse, ranging from public management and public law to regional studies and social and health management investigators. ASG is a loosely coupled entity, a collection of independent teams, people, and activities, and the evaluation materials inform that the research group lacked a clear identity. The research group struggled to find time for research due to teaching demands. The research group shares research outcomes and identifies opportunities for collaboration.

6.5.3.1 Research profile and strategy

The research group members are addressing topical and highly relevant issues in individual projects and publications, and the research group seems to encourage individualised approaches. The research group's collective contribution to production of new knowledge appears to be low, as evidenced by the SciVal report.

There are many national and some international collaborations. Non-academic collaboration is predominantly with local and regional organisations including NGOs and public organisations. There is little collaboration with the private sector. Collaboration with other disciplines within the School of Management and University is limited. The new structure and the name of the PPO Research Group is partly to strengthen research and to develop a strategic focus for research. A clearer focus is not yet visible in the material.

6.5.3.2 Quality of research activities and impact of research

Publications for international peer-review were produced by a relatively small sub-set of the research group. The national publishing was major, partly due to the tradition within the discipline. Between 2015 and 2020, a lot of non-peer-reviewed publications were

produced. Of these, 20.3% were journal articles (A1) and 16.9% were non-refereed articles across all publications, while the majority (43.1%) appeared in publications for professionals or the public (categories D and E). JUFO publications fall mostly within category 1 (46.1%), and roughly the third (32.8%) of all JUFO publications (50) to categories 2 and 3.

The SciVal report reflects the research group's modest output. The number of publications and citations is low: 150 citations in total during 2015–2020, 3.9 citations per publication. The field-weighted citation impact is 0.57. Only one publication is in the top 10% of most cited publications worldwide. The five publications listed for evaluation are not sufficiently impressive when measured by standard indexes.

The international co-authorship is also very low, 5.6% of the publications. The share of co-authored domestic publications is 19.2% (N = 69). This reflects the national orientation.

ASG is engaged with applied local, regional, and national activities (with a few international projects), and this is visible in its scarce external research funding (€522.302 in 2015–20) and list of projects. The panel encourages a mobilisation of larger projects and engagement with wide-reaching societal endeavours. The panel acknowledges the reporting bias caused by some of the external funding being reported elsewhere (platforms).

ASG's capacity to produce high-quality research is satisfactory and improving. Understandably, the heterogeneous list of publications reflect the group's nature. In the self-evaluation, the research group acknowledges not having a clear strategy in the evaluation period due to its dispersed nature.

6.5.3.3 Quality of research environment

According to the self-evaluation report, the main challenges of the group are scarce allocation of research time suppressed by administrative and teaching duties, the small amount of external funding, and several personnel changes.

External funding has been low (less than €100k annually 2015–2019), but has increased lately (€178k in 2020, €522k in 2021). The recent increase is due to success in a handful of external bids, after several years of limited success. Activities to generate external research funding have lacked strategic focus. Funding has been secured from many sources, but projects have been small and predominantly funded by national and regional rather than international funders. The self-evaluation suggests that the research group data does not necessarily provide an accurate picture as the platforms tamper with the overall picture.

6.5.3.4 Future research prospects and recommendations

The research group has traditionally been nationally and locally oriented, but now aims to become more research-intensive and international. This is commendable. The renewed ambition is not yet reflected in the material covering the evaluation period. The panel has noted signs of improved scholarly output: in recent years scholars have published in good outlets, and this should be the recommendation for future.

The evaluation panel concludes that the ASG has a long way to go to become an internationally recognised research group. The panel concludes, that while the research group may be able to improve its capacity to carry out high-quality and impactful research, in the evaluation period this was not visible. Given the diverse nature and loose affiliations of the people who make up the ASG, the panel recommends the ASG clarify what makes a research group a research group.

- The ASG should formulate a clear research strategy to prioritise opportunities to mobilise bigger research projects with more potential to generate uniquely new knowledge. Ideally, the research group would formulate two or three with integrating research themes connecting specialisation areas.
- Following Recommendation 1, the ASG should re-evaluate its operational model and critically assess whether being a welcoming forum for discussions is enough to move to the next level.

6.5.3.5 Suggestions to the University of Vaasa and to the school

The shared suggestions are detailed in point 1.5 above. Especially for the Administrative Studies Research Group, the School of Management should consider whether the research group is still an 'emerging research group', and recognise the developmental needs to become a research group.

6.5.4 Complexity Research Group

The CRG is a recently established research group (2020). Its self-evaluation is quite limited, and it is hard to assess its current position based on the data provided. In the material, the research group was reported as only having 2.7 people on average during the 2015–2020. However, in interviews, 13 researchers were reported to be working in the Complexity Research Group. According to the self-evaluation report, "the group's major objective is to bring together, strengthen, and expand complexity research that responds to the multi-level challenges of modern society."

6.5.4.1 Research profile and strategy

The research group addresses highly topical and exciting issues, as everything related to complexity becomes fashionable in times of economic recession or societal upheavals. Therefore, to assess the research profile and strategy, it is central to look at more concrete research themes, topics, and empirical contexts.

The CRG lists a variety of topics ranging from understanding the meaning of a complex world to systemic models of societal decision-making and control. The Group also promises to shed light on innovation and value creation at different levels of society, social and healthcare ecosystems, services and management, and preparation of foresight information and risk analyses to support decision-making. The list of topics is broad; especially when scrutinised in tandem with the empirical contexts (social welfare and health care, national security and preparedness, crisis management, socio-economic approach to energy transition and resilience (societal and organisational)).

There is some overlap between the research being undertaken by the Complexity Research Group and the Administrative Sciences Research Group. Several of its highlighted projects focus on public services and civil society.

If the research strategy is to develop the theoretical core of complexity understanding in different policy contexts, it is not explicitly expressed in the self-evaluation report. It is unclear to what literature and how the research group aims to contribute to our understanding of complexity in the long run.

The research group's profile is elusive and strategy unclear.

6.5.4.2 Quality of research activities and impact of research

As the research group was established in the last year of the evaluation period, some of the reported evaluation material predate the research group, and some the persons are involved in research group. The research group reports 32 publications in total for 2020, four of them being journal articles. Given the size of the group, the overall number of publications is fine, and the share of international publications is at good level (4.9%). The number of JUF02 classified publications are at a good level, most probably due to the high number of book chapters. There are no JUF03 publications listed. The SciVal report identifies only nine publications with 60 citations in total (on average 6.7 citations per publication). The field-weighted citation impact is 0.87.

As the research group is newly established, it is too early to say anything conclusive about the extent of the research group's research activity and joint research efforts.

6.5.4.3 Quality of research environment

The research group members have been a part of some large and significant projects, primarily from Finnish funders. Reported income generation has been relatively modest (€18k in 2020) although the research group has won a large project, Information Resilience in a Wicked Environment, (€2.1 million of which €649k was awarded to the University of Vaasa). It is not clear why the income from this project is not reported in the income report for the research group. It may be reported under one of the platforms.

The research group has mobilised six research projects in a short period of time: a commendable achievement. However, with an overly inclusive and wide strategy, the spectrum of projects may make it even more difficult to formulate a focused research strategy – does the project portfolio and funding sources lead the CRG's research activity?

6.5.4.4 Future research prospects and recommendations

The evaluation panel concludes that, after its establishment, the research group has accelerated its activities with a degree of rapidity. Of course, the research group is still small and emerging, and only time will tell whether it will contribute to the selected fields. The main challenge is that the research group is too dispersed, with a variety of research topics. Some of the projects that have been taken on are more like consultancy projects than research projects. It is not always clear what the research value of these projects will be and some might be better delivered by platforms.

- The CRG should re-evaluate its research topics and empirical policy spheres, and instead of trying to cover too many topics, focus on the most impactful scholarly topics.
- The CRG should formulate a research strategy to identify the specific research topics with a potential to generate uniquely new knowledge (one to two), to formulate one or two policy areas integrating the research from these topics. In addition, the research strategy should include publication and funding objectives and a plan how teaching activities can be reorganised to support research strategy.

6.5.4.5 Suggestions to the University of Vaasa and to the school

The shared suggestions are detailed in point 1.5 above. Especially for the Complexity Research Group, the School of Management should consider whether the research group is an emerging research group, and recognise the developmental needs to become a proper research group.

International recruitment should be of global quality researchers – when recruitments are available – and focus on excellent individuals with strong research profiles whatever the field, rather than automatically replacing vacancies in research groups. This will help with the renewal and growth of research.

7 School of Marketing and Communication

Panel members: Ulf Andersson, Mika Pantzar, Anu Sivunen

7.1 RESEARCH FOCUS AREAS

The School of Marketing and Communication's parts complement each other in a very pleasing way. It particularly paves way for taking on multidisciplinary phenomena and still have a strong and close connection between its parts which facilitates research on 'grand challenges'. This is evident from the collaborations the School of Marketing and Communication has with other schools at the university and the platforms on research projects spanning the regional, national, and international levels. The contribution of the school's research in terms of new knowledge is good, as evidenced by the citation analysis and the school's success in producing and making available new knowledge to outside academia stakeholders, judging from the impact cases.

The subject competencies of the research groups and the orientation of the platforms seems to be well suited for the goal of multidisciplinary research. Multidisciplinary research is inherently difficult, but thought of as necessary tackling many of today's societal and business challenges. Balancing the most often narrower subject/discipline knowledge needed to successfully produce top quality research with the broader knowledge required in multidisciplinary research is arduous. The structure of disciplinary research groups and cross-group platforms may be a way to overcome such problems and the school's solution of having the tenure track researchers simultaneously belonging to both a platform and a research group may be an excellent way in this respect. Also, the internal cohesion and profile of some of the research groups could still be strengthened and crystallised in comparison to other similar research groups, both internationally and nationally.

The work in organising and re-orienting the school's activities to meet the 'new' goals of multidisciplinary collaboration, doctoral output, and high-level publications has come a long way and the mode of working related to this by the management and the research groups is excellent. The financial resources seem tight, but enough if the external funding can be kept at least at the current level. The school has clear targets for external funding which shows strategic planning for the future. However, the external funding should preferably increase to at least the goals set up for each research group.

The scientific expertise shows some imbalance comparing the three research groups on supervisory capacity. The research group Consumption Research and Customer Value Creation has roughly 1.2 professors per PhD student (two persons from 4th and

3rd stage per PhD student) while the International Business and Marketing Strategies Research Group has 0.7 professors per PhD student (1.1 persons from 4th and 3rd stage per PhD student) and the research group Communications Studies has 0.3 professors per PhD student (1.1 persons from 4th and 3rd stage per PhD student).

The strong international collaborations and networking is an important part of the school's activities, influencing not just the faculty, but also the PhD students' and post-doctoral researchers' career development. There seems to be good support for public outreach and societal impact at the school. From the self-assessment report, it seems that the agreement among the faculty is to really utilise the opportunity to network and collaborate with the surrounding stakeholders and to produce at least one impact case per year, which is a worthy ambition. Particularly this will help in achieving external funding for further activities.

As the research groups are at different stages in their development, the research groups' participation in the platforms' activities may need to be differentiated to pave way for them to focus on their internal development.

7.2 QUALITY OF RESEARCH ACTIVITIES AND IMPACT OF RESEARCH

The quality of research activities and the impact of research at the School of Marketing and Communication rests on the three research groups: Communication Studies, International Business and Marketing Strategies, and Marketing and Consumption Research and Customer Value Creation. The school has an aim to tackle the societal and business changes in an interdisciplinary way.

The number and quality of publications is good. A greater emphasis on publishing in the very top-ranked outlets may help increasing the impact of the school's research in terms of citations as of the evaluated period has been average (Leiden report). The members of the school collaborate with other scholars to a large extent. Most of the publications involve collaborations with international scholars and faculty at other Finnish universities.

The three research groups are having different impact on the number of publications over the period evaluated, ranging from 5.9 publications per researcher in the International Business and Marketing Strategies group, to 2.7 publications per researcher in the Communication Studies group, in between and close to the IBMS, 4.1 publications per researcher in the Consumption Research and Customer Value Creation group.

The engagement in collaboration within the university – multidisciplinary research – is strong. Particularly the arrangement of having tenure-track researchers positioned as joint resources for both the school and the platforms seems fruitful. The efforts

in applications by cooperation between the platforms and the school is a good way to strengthen not only the multidisciplinary research, but also to increase the body of research as such. The members of the School of Marketing and Communication are present in several scientific networks and organisations contributing to the development of their fields. The research projects are oftentimes collaborations with non-academic partners directly contributing to their development and focus.

All in all, the three research groups seem to make up a good mix of specialties for a school of marketing and communication.

It is also noticeable that the research groups are at different stages in their life cycle. The Communication Studies Research Group is the youngest, smallest, and probably the most diverse in terms of research interests (even if it is clearly under the 'umbrella' of communication studies). This means that the different groups are in need of different things, both in terms of resources and in terms of developmental steps to reach the next stage.

7.3 QUALITY OF RESEARCH ENVIRONMENT

The organising of the activities in the School of Marketing and Communication is exemplary. There are clear goals, a clear idea on how to reach these goals, and resources are re-distributed and used to reach these goals. The focus to organise the activities to free up time for research and the drive towards utilising the opportunities in public outreach activities is a good way to maintain and even increase the attractiveness of the research environment. At least in some of the school's research groups, applying for more long-term external research funding through larger research projects would give the research environment some often needed stability decreasing turnaround of employees and administrative tasks.

Being responsive to the different, more immediate needs of the different research groups is important for the management of the school of marketing and communication. Understanding that 'one size doesn't fit all' may improve the productivity of the resources invested into the different groups.

7.4 RECOMMENDATIONS FOR FUTURE RESEARCH

We recommend the school to keep developing its governance in the direction described in the self-assessment report and keep freeing up time for the research activities. This might mean that there must be new additional hires coming in, at least if there should be a substantial increase in research time across faculty.

Making it possible for faculty and PhD students to engage in international activities even to a larger extent can increase the possibilities to produce top-level research and keep abreast with new trends in the field.

Crystallising (some of the) research groups' profile and strategy in comparison to national and international research groups in the same area can help in strengthening the impact of research.

We think it is of imperative importance that the management of the school recognises the different stages the different research groups are in and that the research groups are provided with the opportunities and resources necessary to develop to their next stages. That is, there should probably be somewhat different strategies for how resources should be utilised to facilitate this in each group. We further think that it might be very beneficial if the goals from the university in terms of publication metrics, number of doctoral defences, etc. is combined with goals and objectives for how each group can take their own 'next step' in terms of development and how renewal of the research should be facilitated.

7.5 RESEARCH GROUP EVALUATIONS

7.5.1 Communication Studies

7.5.1.1 *Research Profile and Strategy*

As the CS Research Group states in its self-assessment, the profile of the research group and its focus areas are under discussion and subject to change. The fact that the period of assessment has been very turbulent for the research group is visible in the research profile and the group has faced challenges in establishing a stable research profile and strategy due to constant changes, administrative duties, and short-term employment periods. This makes it a bit more challenging to assess what to predict from the group members in the future. The growth of the personnel and new tenure-track professors may help in stabilising the research in the group and make the research profile more coherent.

The CS Research Group describes its research focus areas during the evaluation period as expert communication, terminology science and technical communication, digital media, game studies, and technology discourses. In the self-evaluation report the CS Research Group outlines the current research topics as media studies, organisational communication, professional and technical communication, and the combination of these. The current focus shows already more coherence whereas the former research areas during the 2015–2020 period were quite separate and internationally not very typical within the field of communication studies. This former focus is however still reflected on the publication forums and research impact of the CS Research Group. The research group describes how it operates in forums where publications are typically published in Finnish, Swedish, and German. Internationally, this is not very typical in the area of communication studies, as international communication research is heavily focused in the US, as well as other English-speaking/publishing areas such as Australia and Europe (e.g., the UK and the Netherlands hosting some of the most prolific schools in the area of communication and media studies in addition to the USA). This way, the former connections to language studies

as well as strong connections to game studies through one professor are very visible in the research profile and impact of the CS Research Group.

A small risk may lie in founding the future research strategy and profile too heavily on the interests of individual members of the research group, which currently seem quite versatile (e.g., based on the most important publications reported by the research group). Most important publications range from an article on rhetoric strategies to an article published in *Game Studies*; and from a handbook chapter related to concepts and terms of specific fields to an article on discourse methods. One of the new tenure-track professors comes from another discipline, cognitive science. If the future research profile is based only on the expertise of the current faculty, whenever changes in personnel take place, this can risk the long-term development of the research group and its strategy.

7.5.1.2 Quality of Research Activities and Impact of Research

The Communication Studies Research Group has been under a continuous change during the last research evaluation period. The CS Research Group was established only recently, in 2017, when a 'transfer of business' between the University of Vaasa and the University of Jyväskylä took place through which the research and education personnel of language studies faculty transferred from the University of Vaasa to the University of Jyväskylä. The CS Research Group had previously shared bachelor studies and research groups with the language studies faculty, and this ended in 2017 and the new CS Research Group was founded. Thus, the quality of research activities and impact of research is mainly evaluated during the years 2019–2020.

During this two-year evaluation period, the CS Research Group has consisted on average of 14.7 person-years of faculty work, including Professors, Associate/Assistant Professors, Post-Doctoral Researchers, Doctoral Researchers, and Research Assistants as well as 18 external researchers. Altogether 94 publications have been reported to be published by these people during the years 2019–2020. Average number of publications is 2.7 publications per researcher during these two years.

However, when counting only the people currently active in the department, the number of publications during the last two years drops to 54 and these publications are authored by only 11 of the group's current 21 members (based on University of Vaasa's website listing group's current employees). This implies that there are new researchers in the research group that have not yet had publications during the evaluation period, but also that one third of the current employees has not been active in publishing during 2019–2020.

The CS Research Group has published on average about 14 scientific articles (either empirical articles or reviews) per year during 2019–2020, in total 27 scientific articles in two years)¹⁰. On average, the CS Research Group has also published four monographs per year (in total seven in two years), and on average eight book chapters per year (in

¹⁰ Due to the changes in group structure, the number of publications was reported only from the period 2019–2020, which better resembles the current structure of the CS Research Group. However, when compared to the overall

total 15 in two years), which makes the research group's output very good in numbers. However, the CS Research Group has not produced any new doctoral theses during the 2019–2020 research period.

When looking at the outlets of the publications, the number of scientific articles (either empirical articles or reviews) reported during 2019–2020 is only 27 out of 94 publications in total. Altogether 15 of the reported publications are book chapters, seven publications are monographs, and 25 publications are conference proceedings. This totals in 29% of all publications being scientific articles, whereas 23% of all publications are book chapters (16%) or monographs (7%), and 27% of all publications are conference proceedings. The percentage of book chapters, monographs and conference proceedings is very high (50% of all publications), but given that these publications are often not open access nor as high impact publications as journal articles, the likelihood of their being used as citations is greatly decreased. Of all 94 publications, 68 are JUFO-ranked, but only five of these are on JUFO level 3, and 12 are on JUFO level 2.

Finally, only 17 of the CS Research Group's publications are listed in Scopus during years 2019–2020, which also gives some implication of the scientific impact of the research group's publications in total. However, the year 2020 has been very good in terms of scientific publications, as 16 of the CS Research Group's publications in Scopus are from the year 2020. Most publications listed in Scopus are published in the area of social sciences (32.1%). The number of publications in the area of computer science is quite high (18.9%) whereas the number of publications in business and management area is surprisingly low (3.8% of all publications). During the years 2019–2020, there were hardly any publications in international communication journals and only a few in national communication journals (*Media ja Viestintä*, *Prologi*)

The CS Research Group's scientific activities outside of publishing consist mainly of 87 expert assignments in scientific conferences during 2019–2020 (60.8% of the scientific activities in total) as well as of 32 expert assignments in scientific publications and compilations (22.4% of the scientific activities). It would be good to know what kind of assignments and which conferences and publications this includes to be able to evaluate the quality of the scientific activities. The number of times the CS Research Group members have acted as an opponent or reviewer of a dissertation during 2019–2020 is good, altogether eight times, and also the number of international research visits from and to the University of Vaasa (altogether seven visits) is very good during these years (given that there was a global pandemic in 2020). International visits are especially important in facilitating the building of networks and new ideas as well as helping to shape the research group and its profile.

The research group has been organising an annual international conference, the VAKKI symposium, attracting mainly national participants, but also some high-level international keynote speakers and producing publications (VAKKI publications; ranked as JUFO1). This seems like a good research activity to gain national and international recognition and networks for the research group.

It seems that the impact area of the CS Research Group's research will undergo some change in the coming years. One of the impact cases showcased by the group in the self-evaluation material is related to terminology studies (Networking with impact in the field of terminology – From societally relevant research and professional engagement to supporting terminology practitioners' work) by an Emerita Professor. As she has retired, it is uncertain how the study of terminology (a specific and rather untypical sub-field within communication studies) will evolve in the future. Nevertheless, in the interviews, the group members showed quite clear strategic plans on how they will integrate these former and more recent research interests of the group together.

7.5.1.3 Quality of Research Environment

Research environment has been especially challenging for the CS Research Group during the evaluation period. This has mainly to do with the changes in the research structure and faculty and the turbulent times resulted by the 'transfer of business' between the University of Vaasa and the University of Jyväskylä. To be able to establish a solid foundation for research and to create a stronger research profile, some stability in resources/personnel and time are needed as well as efforts in designing and building a sustainable and coherent research profile. The research group should focus on applying longer-term external research funding as the goal of getting €200,000 external funding per year has not been quite met or it has come from various smaller research projects, increasing the quick turnaround of employees and administrative tasks.

The group has altogether two full professors and on average eight other academics (on 2nd or 3rd career stage) supervising rough four or five 4–5 PhD students. This ratio is quite good and should be utilised in recruiting talented PhD students as there has been no doctoral theses coming from the research group during the 2019–2020 evaluation period, and only three doctoral theses during the whole 2015–2020 research period.

7.5.1.4 Future research prospects and recommendations

There are collaborations with scholars in other schools of the university and there are connections to the platforms pointing to multi-disciplinary research efforts. Specifically, the collaboration with the Digital Economy and Innolab platforms has been strengthened in recent years by the new tenure-track professors.

Thus, one recommendation would be to further clarify and crystallise the research profile and strategy and to create a stable profile for the CS Research Group related to the new strengths of the school and research group. However, this should not be solely based on the research or expertise of the individual researchers, but on a broader perspective, defining how the future of communication and media studies research looks at the University of Vaasa compared to the research area internationally and nationally. The

CS Research Group should continue the strategic planning and profiling of the research and consider how to best position itself in comparison to other communication studies research groups e.g., at the University of Jyväskylä or the Tampere University.

Introducing pipeline thinking regarding individual and group level publishing plans is also a good development point mentioned in the self-evaluation and is strongly recommended.

We also encourage the CS Research Group to engage more in international publishing. Even though in the self-evaluation JUF03 ranked journals were perceived to be broad and not fitting the specific profiles represented in the CS Research Group, and publishing in Finnish language is also an important goal, we would encourage the research group members to aim at publishing also in international top tier journals to be able to gain international impact in the area of communication studies. Continuing and starting to participate in research area specific conferences such as ICA (for communication and media studies), AOM and EGOS (for organisation and organisational communication studies) and e.g., AOIR (for digital communication/games studies) would position the research group even better with regard to the areas of organisational and digital communication.

Applying for more EU and international funding in the future would also make the research group stronger, as the CS Research Group received no competitive EU research funding or other international funding during the whole 2015–2020 evaluation period. Also gaining more Academy of Finland funding would support the research activities of the group. The amount of other external funding has been steady over the years, but it has come from many sources meaning that the externally funded projects are probably small and labour-intensive in terms of administration. Societal impact of the research could also be increased through networking with international companies and international and national NGOs. The potential of the CS Research Group lies in the excitement related to new research areas that was shown in the interviews among the new and old members of the group and if this is utilised in achieving new networks and funding, this could be a strength of the group in the future.

7.5.2 International Business and Marketing Strategies

7.5.2.1 Research profile and strategy

The profile of the International Business and Marketing Strategies Research Group is scientifically very relevant covering a rather wide array of topics in International Business and Marketing Strategy; one area of research is Internationalisation, one is Foreign Direct Investments, and another area is International Marketing Strategies. In all of these areas there are research efforts on timely topics like digitalisation, sustainability, emerging markets, BOP, and social entrepreneurship.

The research group has a clear goal to display its research through leading and top journals within their field with the aim of having at least two thirds published as articles in international journals and a maximum of one third being book chapters. The research group's analysis shows that it is on a strong trajectory towards this by consistently decreasing its publications in the JUFO0 category and increasing them in the JUFO3 category.

The research group has a deliberate strategy of applying for external funding through the Academy of Finland and Business Finland. Although the group has been successful in two of its applications, it is still lagging against the target set up for the research group. The plan to increase the cooperation with the research platforms to increase the success rate in the external funding applications is excellent. As is revealed in the interviews, the research group is further focusing its successful research by attaching it to sustainability issues which in many ways are of a global character and where multinational companies can be seen as prominent change agents. Bringing its scientific knowledge to issues of sustainability both in its research focus and in its Master's programme (Global Sustainable Business) is good way to secure positive development for the future.

7.5.2.2 Quality of research activities and impact of research

The International Business and Marketing Strategy Research Group contains 27 people who reported that they published their research during the evaluation period 2015–2020. These include faculty, part-time faculty, scholarship researchers, emerita/emeritus professors, visitors, and others having a contract with the University of Vaasa. Publishing on average about twelve articles per year (in total, 70 in the six years), one monograph (in total five), and five book chapters (in total 30) per year, the research groups output is very good. Producing on average 1.5 new Doctors per year (in total nine) in the period is an excellent output for a group this size. The group's members have also during this period published around, on average, seven articles in conference proceedings per year (in total 44), showing that the group's presence in the conferences of different scientific associations, is active.

Most of the research group's publications are international and co-authored. Cooperation with international scholars in publishing and research projects is fairly wide, both in terms of numbers and geographic spread. It is of importance to continue building this fertile network.

The members publish in high quality outlets and its academic impact in terms of citations is very good. There are many publications in top ranked outlets and almost half of their publications are in the JUFO class 2 (26.5%) and in class 3 (19.7%), showing that the research group makes a solid contribution to the fields in which it is active. Notably some recent papers published in Journal of the Academy of Marketing Science and Entrepreneurship, Theory and Practice, shows the potential for publications at

the highest level. The group should continue prioritising publications at AJG levels 4 and 4* (JUF03), as this can help increase the group's reputation, which in turn will facilitate recruitment at all levels, but particularly of high-quality doctoral students. The collaboration with particularly international faculty is good and can be further extended. In many ways prestigious publications, i.e., AJG level 4* or very highly cited papers, and the interest from international top scholars goes hand in hand.

The research group's scientific activities outside publishing are strong in terms of numbers of pursued activities, but lacks transparency in terms of the 'level of quality' of such activities. For example, half of the scientific activity counts are "Expert assignments in scientific conferences' – which is an admirable and necessary scientific activity, but is not necessarily having much to say about the group's scientific proficiency. 'Expert assignments in scientific publications and compilations', which makes up one third of the group's scientific activities is a stronger proof of academic impact, it would though be preferable to know more specifically for which scientific journals and publishers the group's services are in demand. The research group though, can clearly show that its impact and quality is sought for when looking at assignments in governing bodies and advisory boards as well as being examiners of theses and in evaluations of different academic positions. It is clear from the figures provided that the research group is very active in hosting international researchers and visiting international institutions. This is important in bringing new ideas into the research group and keeping it abreast of the research frontiers and new initiatives within its fields. Through the above-mentioned activities, the research group engages in significant scientific activities and publishing in outside publications – regionally, nationally, and internationally.

In addition, there are collaborations with scholars in other schools of the university and there are connections to the platforms pointing to multi-disciplinary research efforts. This is something that can be developed further should the research group find it useful. Currently, the significance of these efforts does not seem prioritised and their contribution to the research group's goals is not clear, even if the group mentions that an increased cooperation with the platforms can help increase external funding. This is an adroitly spotted opportunity for the future.

The research group has been strongly involved in the national research school FIGSIB and has over the years been organising a bi-annual IB conference attracting international participants. It has for a very long time had a presence, both in participating, but also as board member, in the European International Business Academy (EIBA) as well as having had, e.g., track chair roles in international conferences.

The non-academic impact has, particularly with the project International New Ventures – Growth Decision Making, proven to be strong. The research group makes a significant contribution in its collaborations with private companies and with NGOs, both nationally and internationally, while there are less frequent collaborations with the public sector. The group's participation in discussions of its fields of research in media and social media looks very similar to other research groups and institutions.

The group is functioning very well and clearly has an international outlook to its research. The external funding is at the lower end for pursuing any larger projects in terms of personnel, time for research, and reach. The plans to increase collaboration with the platforms and partake in larger initiatives for funding together with other academic partners are promising. Also, the focus on involving more of the local and national businesses to participate in projects is encouraging.

The goals for the research group's research achievements and the way the research group goes about in managing towards these goals seem appropriate.

7.5.2.3 Quality of research environment

The balance of having two full professors and three other academics supervising about – four or five PhD students is appropriate, but should not be stretched further. The research group's teaching duties makes it very challenging to pursue all the activities (teaching, publications, supervision, external funding application, and networking and collaborations) that the group sets out to do. It is though, somewhat of a stretch to both be able to publish in top-tier journals and win funding from external agencies on top of supervision and teaching duties with the number of people listed. Looking at the web page reveals that there are many more individuals attached to the research group which may be an explanation for how the research group still manages to effectively carry out all of its duties.

The research group is well known for its international conference that attracts scholars and PhD students from many countries. Individuals from the research group regularly visit international institutions and it is regularly visited by international scholars. This ensures international collaboration and results in joint publications. The many joint publications overall suggest high collaboration both internally and with scholars and institutions, both nationally and abroad.

7.5.2.4 Future research prospects and recommendations

The International Business and Marketing Strategies Research Group has to date, carried out high-quality and impactful research. To continue this, it is important that collaborations are maintained and possibly also are intensified, both with international scholars for high-quality publications and with the platforms to increase possibilities for external funding. The research group needs more resources to partake in international conferences and to be active in the international research communities within its specific fields. Its aims and intentions as far as this is concerned are difficult to uphold without more resources. The research environment seems to be working well in supporting the ambitious goals the research group has set up. The organising of meetings and seminars to guide towards these goals seems a good way of making progress. This is also corroborated by the junior faculty and doctoral students in the interviews.

The International Business and Marketing Strategies Research Group should continue to aim for top-tier publications. Its strategy and goals to achieve this seem sound.

A more organised seminar series devoted to discussing applications to the funding agencies might be a good way to share experiences and helping each other becoming more successful.

An important task for the research group is to secure the continuation of the docents that are connected to the research group, but also to recruit new prolific faculty members to fill the gaps of those that have left.

The idea of connecting current research specialisations to 'sustainability' is good, but also something which every other group or university is doing. In some ways, this is 'managerial discourse', meaning it does not make the IBMS Research Group unique or stand out from other groups in the same research areas. A more specific association between the research group's specific fields of research and one or two of the United Nation's 17 sustainable development goals (SDG) may be helpful in making the research group unique. Delivering research on a specific SDG or a few specific SDGs will sharpen the contributions. It will probably also increase the possibilities for recruitment. Maybe there is room for a similar way of thinking when it comes to digitalisation, for example, automation is different from communication although both are part of digitalisation.

7.5.3 Marketing and Consumption Research

7.5.3.1 Research profile and strategy

The research group's self-evaluation provides excellent starting points for evaluating the research group's activities and profile in 2015–2020. The professionally prepared report talks about lively academic work, an attitude that serves society and the economy, and about the competitiveness of the research environment. Energising individual researcher requires possibility to make curiosity-driven research. Challenges or profiles set out by university management (e.g., sustainability or digitalisation) which are too general, do not necessarily help in finding curiosity-driven problems. For a world-class research group, bottom-up profiles (and profiling) are the most natural starting point.

The research group could well be compared to the Centre for Consumer Society Research at the University of Helsinki, which is roughly the same size. The research profiles differ in that the Centre for Consumer Society Research focuses more on areas like sociology, anthropology, communication, and social media. The choice of publications, for example, *Marketing Theory and New Media and Society*, which the Centre for Consumer Society Research regularly contributes to, highlights both this and its more theoretical output. At the University of Vaasa, the emphasis is more on business-oriented research (B2B), value creation aspects and regional interests. In both

organisations, sustainable development has been one of the most important research areas. In the number of academic activities, no big differences exist.

In Finland, regional universities have traditionally served the region's companies and administration. This can still be seen in the area of consumer research at the University of Vaasa. However, this has not meant disparaging academic work, but rather focusing on selected focus areas, for example energy and food production and consumption. Research into tourism, retail, housing and fashion has also had its own adherents.

Theoretically, the research group is strongly committed to the CCT tradition, the transformative consumer research, industrial marketing, value creation tradition, consumer psychology, and also innovation management. Self-evaluations emphasise sticking to these themes and related theoretical approaches. Undoubtedly, the solution has been successful when one looks at funding, publications, and social activity. However, focus comes at a price. What guarantees that five years from now, when, for example, the dissertation of a PhD candidate is completed, these choices will still be relevant? What follows CCT, transformative consumer research or theories of value creation? 'Practice turn' of the last decades were preceded by 'cultural turn'. What is the next big thing in academic work? How to guarantee renewal or the birth of new kinds of conceptual innovations, if the past binds too much? Panellists aptly suggested that more effort should be put into areas such as welfare analysis, network analysis, and experimental methods.

7.5.3.2 Quality of research activities and impact of research

In the light of various indicators, the research group's 'Consumption research and customer value creation' has done excellently according to international standards: 97 person years (2015–2020), a huge amount (493) of 'scientific activities', 2.5 doctoral degrees per year, €350.000 competitive funding achieved per year, and (globally) number one in publications in 'Consumption research and customer value creation' (Scopus up to 03 May, 2022). No, doubt, by these figures, the university level objectives have been achieved.

A main concern with the research group is its future, and 'competency trap' coined long time ago by father of organisation research, Jim March. Success with past criteria does not guarantee future success. A risk in the academic world, where simple indicators of success are used, for example 'publications in good journals', is to drift into a situation where the development of new knowledge, methods, or theories is not done. Continuous success requires renewal and diversity and questioning current academic wisdom.

The development has been rapid, and the growth of the research group and the investment in young researchers shows that. The research group has also participated in the operation of new platforms (e.g., Innolab and Digital Economy). I personally consider

the creation of larger entities to be a sensible way to integrate graduate students from abroad into the university. The difficulty of recruiting domestic forces for academic work can be seen in the increase in the number of foreigners at the University of Vaasa, and it is important that those from elsewhere do not have to make the effort alone. Finland needs new researchers, and international recruitments are a keyway that Vaasa has also operated. At Vaasa, the close cooperation between companies and researchers in the region has been quite successful (probably more so than in other universities and other fields of research, for example, in food and energy research). The research group has also been active in the direction of Finland and the Nordic countries, e.g., by organising Nordic consumer research seminars. The research group's role as the founder of the National Consumer Research Association and publication was decisive.

7.5.3.3 Quality of research environment

In the self-evaluation, the special spirit of Vaasa is highlighted. A sense of community is a prerequisite for academic work, and various seminars and retreats are important. Especially when the proportion of foreign researchers increases in the future, this will be crucially important. Compared to the University of Helsinki, the University of Vaasa seems to be a better environment for foreigners. The complacency and self-consciousness of the old university often means introversion. A younger university has better opportunities to open doors for those who come from elsewhere.

7.5.3.4 Future Research prospects and recommendations

Currently, both consumer research and marketing research are under a lot of pressure (challenges) all over the world. On the one hand, researchers in the area are asked to be 'quality verifiers' (usability auditors), for example, when developing new types of artificial intelligence-based algorithms. Can or should consumer research be the downstream (ethical) auditor of product development, or would a more active role be offered as a developer of new types of products and services?

Another critical question is related to the fact that traditionally, marketing research has been strongly (and perhaps appropriately) based on a business perspective and not so much on an understanding of the broader logic of the market economy (e.g., communicative capitalism or critical market studies). Therefore, it has even been suggested that current marketing research is in its terminal stage (see e.g., Marketing Theory).

The third critical question is, is it possible that academic consumption research is lagging behind the practices of big data IT laboratories? For example, research and commercial services at Google are based on extensive and competent use of large data sets. The 'End of science' is exaggerated when referring to the superiority of data giants.

Here, academic theoretically oriented work has its own task, and it is a little difficult to separate this work from the work of the research group. Newly developed theoretical concepts, e.g., in the direction of sociologically oriented Market Studies, do not always appear in the research group's work perhaps to the extent that would be needed.

Risky creative work aiming to formulate radically novel approaches does not easily find publication channels and does not necessarily even merit researchers (or indicators). However, the need for renewal is obvious and it may mean that the Consumer Research Group needs to shift its focus from the psychology of the individual to the level of society. It may even be possible that such reform-oriented work progresses best in the form of working papers or monographs in Finnish. In this case, one must avoid committing too much to national academic indicators such as JUFOS or 'best international journals'.

8 School of Finance and Accounting

Panel members: Agnes Cheng, Lawrence Kryzanowski, Mikko Puhakka, Seppo Villa

In 2018, the university went from having three discipline-based faculties to four schools. The School of Finance and Accounting was created in the process, incorporating the Department of Accounting and Finance and the Department of Economics and Business Law. There were quite a few changes for the school, which created some turbulence in the upper management of the school.

The school is comprised of four research groups: 1) Auditing and Control in Accounting (ACA), 2) Finance and Financial Accounting (FRG), 3) Economics (ERG), and 4) Business Law and Information (BLI). FRG is the largest research group at the school and is among the leading research groups across the Nordic countries in its main focus areas. The ACA is a medium-sized research group with a strong history at the University of Vaasa. The ERG is an active, although small, research group that has experienced success in obtaining external funding and research projects in recent years. The BLI is also a small research group, but Business Law is a very popular minor subject for students.

8.1 RESEARCH PROFILE AND STRATEGY

During the evaluation period, the ACA Research Group focused on four main research areas: Bankruptcy and financial distress prediction, management accounting (roles of management accountants, digitalisation, sustainability, performance measurement, and analytics), external and internal auditing, and financial reporting. The FRG Research Group focused on financial markets and investments, corporate finance and governance, financial accounting, and financial derivatives. The ERG Research Group focused on two main research areas: intangibles and innovative growth and financial literacy and financial education. The BLI Research Group focused on taxation and business law.

Each research group has a bit different strategy in choosing journals for publication. For example, the FRG Research Group clearly indicates that it aims to publish in top journals listed in ABS/AJG. The school also adopts such a view that ABS/AJG journal rankings are better indicators of journal quality. The number of the school's publications in higher quality journals has been increasing, as indicated by ABS/AJG or ABDC. These higher-quality journals only publish original articles that have scientific relevance. Publishing in these journals provides evidence of good research performance.

Training PhD students and working with them successfully is an important strategy for improving research performance. PhD students can often bring in interesting new and original research questions. The school has several highly motivated supervisors. To attract more high-quality PhD students, the school have tried to get more funding, improve career guidance, and add courses in PhD programmes. Some research groups have well-run doctoral research seminars.

8.2 QUALITY OF RESEARCH ACTIVITIES AND IMPACT OF RESEARCH

The research performance is good with respect to both quantity and quality. Especially noticeable is that over the three-year evaluation period (2018–2020), the school's research performance has an increasing trend. Based on the publications in the Scopus database, the school has published a total of 214 articles in 2015–2020, with 127 published in 2018–2020. As to the citations, there were 1518 for the articles published during 2018–2020, out of a total of 2722 over 2015–2020. As to the outputs in top citation percentiles (field-weighted), there are 19 articles and 28 articles for 2018–2020 and 2015–2020, respectively. This indicates that the quality of the publication has increased a great deal during the latter half of the whole research assessment period. The ratio is even higher based on SNIP: 39 articles out of 49, around 80% of which are from 2018–2020.

Collaboration across the school's research groups is limited. Most collaborations come from external and international co-authorship. Collaboration within the research group also seems abundant. Collaboration with the other schools exists, but is not especially broad or deep. Collaboration with platforms was reported as challenging, but improving due to some common tenure-track positions explicitly linked to platforms. The cooperation exists across all platforms, but is still mainly on an individual level.

The school believes in the importance of multidisciplinary research, particularly in relation to contemporary phenomena such as sustainability, social responsibility, and digitalisation. Large-scale funding typically expects multidisciplinary cooperation. The ERG Research Group achieved such large-scale funding between 2018–2020. Platforms have experience in regard to funding applications and project management resources and should be especially helpful for multidisciplinary research cooperation. However, there are still barriers (mental and physical) to cooperation. The platforms and schools have different priorities; common performance measurements that support collaborations do not exist. As a result, the connection between platforms and schools is rather loose and random. Instead, the school has very good connections with the practices, especially the ACA and the BLI Research Groups. Several senior professors provide consulting and work with non-academics for publications.

8.3 QUALITY OF RESEARCH ENVIRONMENT

Recruiting and retention of capable researchers is important for producing quality research. Teaching reduction and research funding contribute significantly to this goal. It is apparent that the school cannot compete internationally with universities outside Finland. Another important aspect is the reputation of the research culture and the placement of PhD students. It seems that the FRG Research Group is well-known within the finance industry in Finland. It has a famous Master's programme in finance which attracts good students, and some of them choose to continue their PhD study at the school. It seems that the ACA Research Group also has a good student pool from the Master's programmes from which to draw from for its PhD studies. We believe that the school is improving in recruiting capable researchers, which can be seen in the four recently recruited tenure-track faculty members.

The school's budget funding for research has had a very marginal increase, and external funding has increased steadily, but is still low. In terms of the total number of research personnel, there is no significant increase. As teaching is in high demand, there is some situation-based transfer of some positions between research and teaching; also, two teaching assistants were appointed to help with teaching workloads. The school had three international visiting professors and part-time professors/researchers to assist in raising research performance. The balance of the school focuses on teaching due to the popularity of the undergraduate and Master's degree programmes. This causes challenges when it comes to research and applying for research funding.

The school does not have essential digital data for conducting essential research in accounting and finance, but fortunately, the researchers actively seek corporations with external and international researchers. The ERG Research Group received a high of number of grants and has successfully created unique data that can help the school's researchers conduct unique research.

From the research perspective, each research group has very good leading researchers. However, the turnover of senior researchers (especially in the ACA Research Group) over the evaluation period was high, and leading researchers have to carry out a lot of administration and teaching tasks. The heavy teaching and administration load reduce the time to write proposals for seeking grants and to conduct research projects. Even with this difficulty, the school performed pretty well in research.

8.4 RECOMMENDATIONS FOR FUTURE RESEARCH

There is a credible message here for the University administration. The current means and ways, as well as procedures applied by the University to support funding applications, and other support measures for research, should be carefully scrutinised.

There should not, however, be many added resources to improve this function, just changing the focus of the appropriate support function.

An important measure for comparing international research success of business schools is the quality of their publications. This is often exemplified by the number of publications in the journals of the Financial Times 50 list, and the ABS level 4 and 4* journals. It is a tall order for economics research to get published in FT50 or ABS4 levels. But it is good to keep in mind where the highest scientific goals (measured by the quality of publication outlets) are. This is, as well, true to the whole business school. To be successful in the face of ever tougher competition (due to e.g., low population growth, and less public finances of universities), and business schools, and indeed their research units, should pay serious attention to defining a credible strategy, including mission and vision.

The school has faced a lot of challenges during 2018–2020. One major challenge is that the budgetary research funding base has been decreasing. Also, the school's fields of research for international reputation does not seem to have been fully recognised in the university's strategy. In the self-evaluation report, the school has listed several future directions and plans to improve its research performance. Below we list several recommendations.

- Each research group should vigorously pursue its objective of conducting world-class research through the following channels:
 - increased internal collaborations through the research platforms within the research group as well as with members of other research groups in the School of Accounting and Finance.
 - increased collaborations with researchers in Nordic countries that could include the exploitation of data on individuals and their asset holdings that are available to Swedish researchers.
 - increased collaborations with researchers from non-Nordic countries which would require increased logistical support from University of Vaasa that would increase available resources and facilitate entry into higher ranked journals.
- Each research group should try to target traditional high-quality journals. To be reputable in each research group, different lists of journals should be provided. For example, the Journal of Accounting, Auding and Finance (JAAF) is considered as an A- journal, but it is not listed as a ABS4. On the other hand, some ABS4 journals are not considered top tier by different disciplines. Since JUFO affects funding, encourage publications in journals that are ranked high in both JUFO and ABS (or ABDC) listed journals.
- Better award system should be established to motivate researchers to publish in top-quality journals and to write proposals for grants.

- Consider sharing revenues earned from the Master's programmes between the University of Vaasa and the school. This will motivate schools to have more and better Master's programmes that generate funds for the university. These funds can also be used to motivate researchers.
- Design more integrated and aggressive fund-raising activities. The school has many professors who are very much connected with businesses. Consider getting their participation as business are more likely to donate money if they know the people involved with the research.
- Reduce workload (teaching and administration) for productive researchers. For example, some repetitive work can be done by assistants. A careful look at researchers' workload, trying to find out if there is something less important that can be transferred to the university administration professionals.
- Increase/improve university support in pursuit of external research funding from the 'Academy of Finland' and 'Competitive EU research funds' either individually or through the research platforms. Actively develop cooperative ways to seek external funding. For example, successful PIs may guide inexperienced researchers to seek external funding. Organise some brainstorming sessions to develop ideas. For example, annual solicitation campaigns of alumni and friends of the university or the funding of research chairs or professorships in the next capital campaign.
- Improve the hiring package as much as you can. For example, provide a sign-in bonus by reducing the teaching load and some fixed research funding for the first one or two years.
- Recruiting doctoral students and postdoctoral researchers on central topics area of the school and on new innovations valued by the school.
- Organise external workshops under the school, both face-to-face and online. Online seminars open to researchers around the world can help promoting the school's international reputation with low costs.
- Improve research training for the Master's students and provide reward/support to encourage publications of joint work with Master's students.
- Encourage teaching-focused faculty members to publish practical-oriented articles as many teaching-focused instructors have great knowledge of the business practices. This will help transfer knowledge for teaching and also help accreditation.
- Encourage publications on journals that are ranked high in both the JUF0 and ABS (or ABDC).
- Continue to develop good international Master's programmes and recruit the best PhD students from the Master's programmes. Consider developing an international doctoral programme in contract design for the BLI Research Group. It seems that legal design or contract design is a specialty of the BLI Research Group. If costs can be covered, this programme can boost up research production.

- Build up more digital data to share across research groups. As much of the school's research is data-driven, building up proprietary data shall boost unique studies.
- Expertise in Economics (e.g., behaviour economics, econometrics) should be identified and developed as many the school's studies rely on economic theory and methods. Consider developing research workshop focusing the most recent econometric methods used by finance studies. This workshop can be opened to international audience, even with a fee, which can generate some income and reputation.
- The university should take a careful look at the current support functions for research, and their operation. Opinions from senior professors should be communicated through effective channels, and the suggestions should be seriously considered and followed by the top management.

8.5 RESEARCH GROUP EVALUATIONS

8.5.1 Finance and Financial Accounting

8.5.1.1 *Research profile and strategy*

According to the FRG Research Group, its "main, broadly defined focus areas of research are financial markets and investments, corporate finance and governance, financial accounting, and financial derivatives." Our review of the articles published by the FRG Research Group over the evaluation period indicates that most of the articles relate to financial markets and investments (including derivatives) and to a lesser extent corporate governance. Few papers were related to financial accounting while many papers report financial or other types of relevant information for financial decision making. The research focus has also been on important societal concerns such as diversity, ethics, emissions, and financial innovations such as cryptocurrencies (i.e., digital currencies). More than 20 articles deal with issues such as the effect of fossil fuel volatility on financial asset returns and markets that are used to price carbon emissions as one of the ways to reduce greenhouse gas (GHG) emissions. The papers are highly relevant and original, and make significant and insightful contributions to the literature, policy setting, regulatory and practitioner practice, and everyday life. They are varied in terms of testing methodologies and topical areas.

The recent refocus to five core areas of research is a good one: Financial Markets, Instrument, and Institutions; Financial Analysis of Firm Policies and Outcomes; Governance and Compliance; Responsibility and Sustainability; and Risk Measurement and Management. We would suggest adding 'Diversity' to 'Responsibility and Sustainability'. The researchers should also include the effects of other forms of diversity (ethnicity, age, connections, financial literacy, etc.) in corporate governance and investors

on financial decision making. To deal with this issue in greater detail, we refer to the FRG Research Group's impact case. The academic papers cited in the impact case all have citation counts, and further, a few academic articles get written up in the Wall Street Journal or New York Times or are referred to in various EU publications. Two of the three scientific articles in the impact case are co-authored with a senior economist from the Office of the Comptroller of the Currency (OCC) of the U.S. Department of the Treasury. We agree with their self-assessment score of excellent (3/3).

The FRG Research Group's 'Open Access publications' have averaged 21% over the evaluation period with small variation except for 2016 when it was 9.8%. This helps the FRG Research Group's citation counts and is facilitated by no- or low-cost options for open access in journals published by some publishers.

8.5.1.2 Quality of research activities and impact of research

Over the evaluation period (2015–2020), the FRG Research Group has continued to perform substantially above average in terms of number and quality of publications. There is a nice upward trend in the number of refereed articles and in international journals. The FRG Research Group's refereed articles represent 39.9% of the total number for the School of Accounting & Finance.

The higher quality of the refereed publications by the FRG Research Group is apparent using various benchmarks. 24% of the FRG Research Group's 133 refereed publications were in journals that are classified in category 3 (second highest) and 4 (highest) in the European standard ABS-AJG rankings. When benchmarking ABDC rankings used in AACSB (the Association to Advance Collegiate Schools of Business) accreditation, only 3.8% have the highest rank of A* and 39.8% have the second highest rank of A. One of the A journals is the *Journal of Business Ethics* that is on the List of FT's Top 50 Journals. Instead, traditional finance journals, such as the *Journal of Banking & Finance* (JBF), *Journal of Financial Markets*, *Journal of Corporate Finance* (JCF), *Journal of Business Finance & Accounting*, etc., are lightly represented in the list of publications.

The FRG Research Group has vigorously pursued the fruitful strategy of collaboration externally for its publications in refereed journals. With regard to collaborations, the number of co-authored international publications has increased from 19 (2015–2017) to 40 (2018–2020). This has contributed to a higher quality of publication. Collaboration with Finnish entities is low and has not changed much over the evaluation period. Increasing such collaborations could negatively impact the volume and quality of the FRG Research Group's research output unless carefully chosen. One collaboration with researchers from Sweden provided access to the unique dataset on the trading transaction records of private investors from Sweden. Since such data are generally not available in other countries, further collaborations of this nature are advantageous for publication in higher quality, refereed journals, and should be encouraged.

The FRG Research Group has a good record of expert assignments in scientific publications and compilation, accounting for 50% of these categories for the School of Accounting & Finance. Such activities are helpful in obtaining contacts and recognition which aid publication in refereed journals. The FRG Research Group is weaker in expert assignments in scientific conference and assignments in governing bodies/advisory boards of scientific organisations. Improvements in these two categories should be considered for the FRG Research Group's future research strategy.

The FRG Research Group has been very active in the important function of disseminating academic knowledge to the wider public through writing columns or comments and being interviewed for various media channels. The international print media that has discussed their research include The Wall Street Journal and the New York Times. According to the FRG Research Group's Self-Evaluation Report, the societal importance of the academic output has resulted in cites in public policy reports of the European Parliament and the Finnish Ministry on Social Affairs and Health.

8.5.1.3 Quality of research environment

As occurs in many universities, retention of faculty can be a research environment problem. The FRG Research Group has followed the practice of hiring its own PhD graduates. Many international peers have a policy of not hiring their own PhD graduates. The underlying rationale is to minimise 'in-breeding' and to encourage 'faculty refreshment'.

Incentives for conducting research include promotions from junior to senior positions depending largely upon the quality and not quantity of research output. There appears to be quite limited monetary or resource-based incentives for research excellence, such as merit pay increases or one-time cash payments for publications in the top three or four journals or teaching load reductions for productive researchers.

The training of PhD students is rigorous and cost effective via the FRG Research Group's participation in two Finnish consortiums; namely, the Graduate School of Finance (GSF) and Finish Doctoral Programme in Business Studies or KATAJA. No faculty member from the University of Vaasa has taught a GSF core course. Assuming that budgetary funding is not an issue, the FRG Research Group should attempt to obtain a teaching position for one of its members on the GSF. This would further reinforce our observation that the FRG Research Group is in the top tier among its Finnish peer group. Six doctoral students graduated during the evaluation period and are well placed in various organisations although these placements appear to be in the Nordic countries including the University of Vaasa. Also, although the completion rate and the percentage of foreign students is low for the School, we were told that such is not the case for the FRG Research Group where most of its doctoral students are foreign students.

The FRG Research Group's external funding is low over the evaluation period (2015–2020). The FRG Research Group's last year of funding from the 'Academy of Finland' was 2016, and it has received no 'Competitive EU research funding'. The FRG Research Group has an inconsistent record for 'Other external research funding' and no collaboration in four projects designed to facilitate external research funding. Given its publication record, we would not have expected this. Yet, much of the research conducted by the FRG Research Group does not require such funding and the needed resources can be obtained through international collaborations with researchers and more resource-endowed entities, such as the Federal Reserve. The FRG might consider more interactions with the corporate sector, but given the small size of that sector locally that may be very difficult. The excellent reputation of the FRG Research Group members would be further displayed if they had greater success in obtaining external research funding from the 'Academy of Finland' and 'Competitive EU research funding sources'.

8.5.1.4 Future research prospects and recommendations:

The FRG Research Group's main future-oriented objective is to: "further improve the quality of research outlets and to publish a large proportion of our research output in journals that are classified in categories 4 and 3 in the ABS-AJG." The FRG Research Group has the potential to satisfy these aims. However, this will require additional resources in terms of time for research and research support that is competitive both within University of Vaasa and with its international peers. Increase in international networking will require enhanced logistical and financial support from the university. In turn, increase in the amount of external funding will require a careful cost-benefit analysis, especially for very competitive funding. Interestingly, the FRG Research Group does not include the corporate sector in its list of entities in which it aims to substantially strengthen its future interactions and collaboration to promote research utilisation and create an impact beyond academia.

The following recommendations are based on the previous sections.

- The FRG Research Group should continue to vigorously pursue its objective of conducting world-class research through the following channels:
 - i. increased internal collaborations through the research platforms and with members of other research groups in the School of Accounting and Finance. This includes with the Economics Research Group, which has developed two unique datasets that could be used for collaborative research; namely, the dataset of intangibles could be used to examine firm reporting issues and firm valuation, and the dataset on financial literacy could be used to examine various issues related to the behaviour of less and more sophisticated investors.

- ii. increased collaborations with researchers in Nordic countries that could include the exploitation of data on individuals and their asset holdings that are available to Swedish researchers.
 - iii. increased collaborations with researchers from non-Nordic countries which would require increased logistical support from University of Vaasa that would increase available resources and facilitate entry into higher ranked journals.
- To further its reputation building, the FRG Research Group should continue tilting its target outlets somewhat to traditional journals such as the *Journal of Banking and Finance*, *Journal of Corporate Finance*, *Journal of Financial Intermediation*, and *Journal of Financial Markets*.
 - Serious consideration should be given to providing more monetary and/or resource-based incentives for research performance.
 - There should be a more equitable sharing of revenues earned from new Master's programmes between University of Vaasa and the research groups, especially for those programmes with thesis requirements.
 - Consideration should be given to providing more help in dealing with the increasing administrative workload. Provision of more professional assistants is a possibility to deal with this impediment.
 - Members of the FRG Research Group should increase their pursuit of external research funding from the 'Academy of Finland' and 'Competitive EU research funds' either individually or through the research platforms. This will require application support from the university.
 - The FRG Research Group should consider implementing a policy of hiring its own PhD graduates and the university needs to streamline the hiring process and the package offered for potential new hires. A common practice, for example, in Canada is to offer potential new hires (particularly new PhDs) a reduced teaching load and a fixed research budget for the first one or two years.
 - The FRG Research Group should attempt to obtain a core teaching position for one of its members on the GSF (Graduate School of Finance) to further demonstrate its ongoing ranking among the top tier in universities in Finland.

8.5.2 Auditing and Control in Accounting Research Group

8.5.2.1 Research profile and strategy

The ACA Research Group describes its research strategy as seeking publications in internationally distinguished accounting and auditing journals while valuing open-access publications. In addition to publications, the research members seek exposure to other researchers through Google Scholar and conference presentations. For the

inspection period, the publication record of the ACA Research Group adhered to its described strategy. Most of the publications (65.7%) are international publications; 24 published papers are also co-authored international publications, while 37 publications are published in open-access journals. Judging by the number of publications co-authored with researchers outside the university and the citations from the publication, the research has achieved good visibility. Fintech and sustainability are two important research areas, and the ACA Research Group has already been working in these areas. A strategic focus on these areas can boost publications and have academic and non-academic impacts.

The research group is organised into four main research areas: Bankruptcy and financial distress prediction, management accounting, external and internal auditing, and financial reporting. The majority of the project funding consisted of the recent Academy of Finland allocation of two million euros and a post-doctoral research grant from the Academy of Finland.

The research group consists of one to three full-time professors, three to five full-time/part-time postdoctoral researchers, and five to eight PhD students at the time. The group has no formal organisational structure, while communication of important matters between professor-group members is active. The main group activities were regular research seminars ('ACA days' held at the University of Vaasa campus).

8.5.2.2 Volume and quality of research activities and impact of research

The ACA Research Group has seen significant growth in research performance for the six-year inspection period judged by the publication number and quality. During the 2010 to 2020 period, ACA has published 70 articles in refereed journals. And 42 articles were identified by the SCOPUS database. This is a significant improvement compared to the 20 published articles identified in the last six-year period. The articles are published consistently across all years, which signifies sustainable growth in research output.

The five key papers presented in the self-assessment report are all published in highly regarded peer-reviewed journals. These papers are highly impactful in the citations. Most notably, the paper Altman, E. I., Iwanicz-Drozdzowska, M., Laitinen, E. K., & Suvas, A. (2017) is cited 566 times since its publication, which is very impressive. The paper is also a prime example of international collaboration engaged by the research group, as Professor Altman is the leading expert on crash risk and financial distress. The overall engagement in collaboration is very active.

The impact of research is highlighted by the publication output as well as the impact case provided by the RG. The 42 publications identified in the SCOPUS database receive 512 citations in total or 12.2 citations per publication. The field-weighted citation impact for the inspection period is 1.24, indicating that the publications are considered to

be above average (1.0 impact) compared to global publications. Given the resources available and the performance of the last inspection period, it is impressive that the ACA Research Group can produce impactful research of this level.

The research groups impact on business and industry is impressive. The research group highlighted an impact case of the research project aimed at creating an advanced new way to measure and compare credit risk, especially for small and medium-sized companies (SMEs). The model has helped, on the one hand, several SMEs to get finance for their operations and growth and, on the other hand, helped many investors to find good investment opportunities during the last five years.

In addition, the research group collaborated with Suomen Asiakastieto and developed online systems to assess the default risk of business companies. Education videos produced for the Finnish Equine Information Centre have been seen by over 4,000 entrepreneurs. Models for the Finnish Equine Information Centre were also built to monitor, plan, and manage the business for entrepreneurs. Overall, the research produced by the ACA Research Group is impactful and relevant to practice.

8.5.2.3 Quality of research environment

The research group faces many hardships in its research resources and environment. The leading issue is with its personnel. To our understanding, the research group faced a high turnover of full professors during the period. It especially hindered preparations of external funding applications. The issue is amplified by the long recruiting processes of new staff and because of the lack of funds, it is less likely for the research group to offer a competitive contract to recruit new staff.

The heavy teaching load of the staff is another important issue. The ACA staff were responsible for teaching in one of the biggest Master's programmes, 'Accounting and Auditing' at the University, yet the number of teaching staff is relatively low compared to the other programmes. The research group also lacks modern and, ultimately, the most important accounting databases (e.g., Compustat).

Externally, the research group received funding from the Academy of Finland as a primary source. For the first four years of the inspection period, the research group received a total of €306,413 from the Academy of Finland, and no further funding was received after 2019. Compared with the school in general, the external funding source is scarce and provides limited support. Judging the difficulties faced by the research group, we advise the research group to seek help from the university or other departments in sourcing leads for funding sources.

Internally, we observe that the internal workshops and presentations are conducted mainly by the post-docs and PhD students, while the participation from experienced

professors is incidental. Given the strength of the research members, we advise the research group to increase inter-research group communication regarding research progress and projects to stimulate research outcomes.

3.5.2.4 Future research prospects and recommendations

Even though facing disadvantages such as heavy teaching and lack of data, the research group has performed well in many aspects and should have a good chance to improve.

- Continue and increase research cooperation among ACA faculties: Although publications from the research group are impressive, the publications, especially international publications, are concentrated on works co-authored with a relatively small group of authors. Inter-research group collaboration can help boost the publication profile for all research members.
- Encourage joint research projects with finance and economic research groups: Many accounting research studies are finance- or economic-based. Bringing in new research methodologies or findings to ACA research can enhance competition.
- Encourage researchers to collaborate through platforms: The platform provides a very good vehicle for collaboration across disciplines, as cross-discipline research is important in its own right. Researchers should aim to take advantage of the platforms to develop meaningful projects that has society impact, also increase publications.
- Actively develop cooperative ways to seek external funding: For example, successful PIs may guide inexperienced researchers to seek external funding. Organise some brainstorming sessions to develop ideas.
- Seek international co-authors to access data and increase productivity: Data is expensive, and purchasing the data may not be realistic. Seeking co-authors can help solve data problems.
- Take advantage of the close network with auditing firms and companies: A tight network with auditing firms and companies is very beneficial. For example, if a researcher develops a research question on auditing, the researchers can consult auditors or conduct a survey. In addition, researchers may work together to raise donations from connected companies or alums to increase research funding.
- Reduce the teaching load for researchers and be aware of the university-level teaching support to reduce the burden: Consider, for example, hiring teaching staff when a research faculty shows research productivity. The university is assisting in developing pedagogical materials (e.g., pre-recorded lectures), so teachers do not have to do things all by themselves. Using these prepared materials shall save some teaching time.

Getting assistance for administrative work: Senior professors may do too much administration. It shall be more beneficial if administrative tasks can be conducted efficiently and effectively. For example, hire student workers (if a secretary cannot be hired) to reduce repetitive work (or automate the repetitive work).

Organise more external workshops, both face-to-face and online: Inviting prominent professors to give face-to-face seminars is expensive, but is good for networking and developing joint projects. Online seminars should also be used to exchange ideas and boost productivity.

- Convert Master's thesis to research output: Lots of teaching load is due to the supervision of Master's students. Researchers shall design ways to train the Master's students to conduct research efficiently and turn their Master's projects into research publications.
- Encourage teaching-focused faculty members to publish practical-oriented articles: Many teaching-focused instructors have great practice knowledge of the business practices. They can publish articles in professional journals or education journals. This can also help accreditation.
- Encourage publications on journals that are ranked high in both the JUFO and ABS (or ABDC).

Publications in JUFO journals help research funding from the government. Publications in ABS (or ABDC) journals help recognition by other academicians in the same area. More reward should be given to publications in high-ranking journals in both ranking systems.

8.5.3 Economics Research Group

8.5.3.1 Research profile and strategy

The Economics Research Group is organised in two main research areas (or subgroups): intangibles and innovative growth (IIG) and financial literacy and financial education (FLE). In addition, there has been research in energy and environmental economics, banking and macroeconomic stability, and some issues in financial markets. In general, the research focuses on applied economic research. The research group has currently two full professors, one assistant professor (tenure track), and two university lecturers, four other researchers, one of whom is a doctoral student. As usual in the economics departments of Finland's universities the unit is small.

The doctoral courses in economics are organised by the Finnish Doctoral Programme in Economics (KAVA), which since 2016 has been a cooperative organisation between the nine Finnish universities, where economics can be studied as a major. Most of the

courses (core, special) are arranged by the Helsinki Graduate School of Economics¹¹ and taught by the Helsinki GSE faculty and visitors. Aalto University, Hanken, and University of Helsinki run jointly the GSE. The total number of doctoral degrees in economics was four during the period in question: one in each year 2015–2017 and one in 2019. Before 2015 between 1999 and 2014 there were four doctoral degrees from Vaasa. Economics has occasionally received a grant from the Yrjö Jahnsson Foundation for a first-year doctoral studies in economics. It would be good if this grant could be secured every year.

8.5.3.2 Quality of research activities and impact of research

The research of the research group is concentrated in two main topics: IIG and FLE. These topics (and the work of researchers) do not seem to be closely connected, which means that there might be some missing opportunities for synergies in research. This is a deficiency for a small research group such as the ERG. Obviously, an important constraint for achieving synergy and cooperation is the current composition of faculty and the skills and interests of the researchers. This is a problem at least for the short and medium runs. There should be efficiency gains (due to synergies) achieved in the future. However, both IIG and FLE are internationally connected. The FLE group is also rather well connected with other research units inside the University, and with outside collaborators (firms etc.) Hopefully these cooperative endeavours will produce internationally high-level publications.

RG lists six important publications during the assessment period: two of them are in the area of FLE and four in IIG. An indication of the scientific quality of these publications can be obtained by looking at the REPEC list of publications¹² based on simple impact factors for journals. The list is updated frequently and includes 2836 journals. In that list the journal *Industrial and Corporate Change* occupies the highest position of Vaasa publications, 94, and the journal *The Journal of Pension Economics and Finance* occupies position 390.

The research group received an impressive amount of outside funding during the assessment period, a bit more than €1.1 million. The main source has been the Academy of Finland. During 2019–2020 the research group also did very well with funding from the EU. Total external funding has increased during 2018–2020 quite impressively. Even though research group has been very successful in securing out outside funding, the research group writes about funding in their self-evaluation report: “Our success rate has been very good, but we perceive increased competition given the increasing supply of high-quality researchers in our fields, limited help available from the University of Vaasa in supporting applications for funds and carrying (out) projects, and decreasing trend in total external funding available in Finland.” The current ways and procedures applied by the University to support funding applications, and other support measures for research, should be carefully scrutinised! There should not, however, be many added resources to improve this function, just changing the focus of the appropriate support function.

¹¹ <https://www.helsinkiigse.fi/> ¹² <https://ideas.repec.org/top/top.journals.simple.html>

An important measure for comparing international research success of business schools is the quality of their publications. This is often exemplified by the number of publications in the journals of the *Financial Times* 50 list, and the ABS level 4 and 4* journals. It is a tall order for economics research to get published at FT50 or ABS4 levels. But it is good to keep in mind where the highest scientific goals are. The academic impact of the two main research topics of the research group, IIG and FLE, is somewhat modest. This assessment is based on the quality of publications achieved up to 2020. Given the recent good external financing, there certainly is potential for better results. The fact that these two main topics are not closely connected is a drag in trying to achieve better results.

The IIG group presents an impact case for the 'Intangibles and low growth in Europe'. In addition to Vaasa there are seven other international participants in this endeavour financed from the Horizon 2020 of the EU. The GLOBALINTO project has serious academic content with policy and it has produced a fair number of policy briefs. This objective is ambitious, but at the same time hard to achieve since policy makers should be convinced at some point for the group's goal to have a real effect. The GLOBALINTO certainly has potential, but perhaps its main impacts will be seen later. The FLE group has projects of non-academic sort with outside organisations. These projects also have academic content and have led to research publications.

8.5.3.3 Quality of research environment

There seems to be a disconnect and lack of cooperation between IIG and FLE. From the point of view of research profile and strategy this is a substantial problem. Since the research group is small even in the Finnish context, it would be profitable to pay serious attention to developing a better and more credible profile. To be successful in ever tougher competition (due to e.g., low population growth, and less public finances of universities) business schools, and indeed their research units, should pay serious attention on defining a credible strategy, including mission and vision.

The research strategy should be clarified and sharpened; there certainly is room for a better and more explicit strategy. For example, does the research group want to have high quality international research in some chosen area(s) of research? In their report the research group writes: "We consider our research topics to be high on the agenda both now and over the next five to 10 years. We should have enough large research projects and ongoing research, and we have promising personnel in tenure tracks who we expect to qualify for professorship." Concentration on quality is important. And, indeed given the relatively small research unit, is there room for more than one high quality research work? The current research of the IIG and FLE will certainly provide credibility for sharpening up the strategy.

8.5.3.4 Future research prospects and recommendations

Based on the publication record the quality of research has been somewhat modest. In many other senses, the results have been good even though the research group has a serious disconnect between its research (sub)groups. This also means that there is much unused potential. The outside financing has been quite impressive. The international connections for such a small group are pretty good. The disconnect points, at least partially, to the fact that managing the group (i.e., its leadership) has not been at the optimal level. Reorganisation of the research group at some point in the future is necessary. The university should require and support this task.

There are credible possibilities to improve the quality of research. If the impressive outside funding can be continued, it is a solid foundation to build on higher quality research. We summarise our main recommendations, some of which should be implemented soon and others in the longer run.

The most important longer-term goal is to streamline the research focus.

- Clarify the strategic goals of the research group so that strategy promotes the shared view of how, and what type of, research can best contribute to the quality of research.
- The research cooperation between IIG and FLE should be substantially improved at least in the medium to long run: One way to improve the quality (and the quantity, too) of research is to cooperate with other disciplines of the school. Finance and accounting are close to economics especially in relation to methods. Joint research projects with finance and/or accounting should also be encouraged.
- Researchers should think carefully to which activities to put their most effort. The future recruitment of faculty should be directed toward the fields of economics that best enhance the quality of research: It is advisable, at least in the longer run, to concentrate on one main area to which research efforts will be focused. It is also important for the university (and the research group, too) to think carefully what types of job openings, especially for professorships, will best enhance the research the university and the research group want to promote. This should help in responding to first recommendation above.
- The university should take a careful look at the current support functions for research, and their operation. Researchers should be consulted when improving this function. Despite of quite an impressive record of outside funding, the research group has expressed dissatisfaction on the support they received from the University for application procedures.
- One important general point for the research group, and indeed the whole university, is to consider the ever-increasing importance of big data, artificial intelligence, and machine learning in the contemporary society. The methods used in economics are quite well suited for dealing with these issues. There are e.g., Master's programmes

in business analytics, where economics has a prominent role. The research group should be open-minded for future developments, which do not necessarily follow 'traditional routes'.

8.5.4 Business Law, Information and Knowledge Research Group

8.5.4.1 Research profile and strategy

Business Law research in Finland is done in law faculties and business schools. It is also typical that the research groups are small. The research group has not been organised formally, but consists of researchers working mainly at the School of Accounting and Finance. The research group produces multidisciplinary research in the intersection of business studies and law. The research programme emphasises a phenomenon-oriented connection between research on corporate law, tax law, and business. The goal of the research is to examine the impact of legal and business information on the economical decision making in businesses and among their owners. It targets at research that produces tools to create a more efficient business environment, manage risks and develop new business opportunities. Business design is a new innovation.

The main research method of the research group is legal, but its research topics are closely related to business. The research group's business connections are further underlined by the fact that, unlike typical legal research, the research group does not concentrate only on the content of regulation. The aim is to present commercially appropriate recommendations for action based on legal research and to develop a proactive and preventive perspective on legal research. The key is to provide legal research as a tool for business development and strategy implementation.

The research group concentrated on two main topics: tax law and commercial law that are independent research areas. From the point of view of research profile and strategy this is a substantial problem, tax law is always under pressure of government policy and it will follow government's policy decision. Since only some researchers are active in the research group, it would be more advantage if they would work out a strategy in which they focus more related topics. On the other hand, they could have a collaboration strategy on both topics, which can be a winning strategy in the future in order to keep scientific relevance on high level. Collaboration could open academic channels to international publishing and to higher JUFO rating results and it could give a possibility to maintain research originality as followed by professorships.

The research group has staff in different positions. On average, some of the permanent staff have been in research-oriented positions (professors) and some in teaching-oriented positions (lecturers). Additionally, the group had part-time University teachers. The research group has currently two full professors, one associate professor (20%), one assistant professor, two lecturers, one teacher, one university teacher, three postdoctoral,

some part-time class teachers, and relative high number of doctoral students. In addition to this, there are some other active members in the research group: a professor 15%, a professor emeritus, an emerita and docents. In spite of the different positions and the relative high number of the members, the research responsibility applies mainly to a few professors, and university teacher and a docent. Some members of the research group are focusing mainly on teaching. Postdoctoral researchers are at an early stage in their research careers. The rest of the members are not particularly active researchers.

8.5.4.2 Quality of research activities and impact of research

The members of the research group are divided into tax law researchers on the one hand and private and commercial law researchers on the other. The research areas are mainly following the professors' fields of research with a focus on either taxation or other business law. During the period 2015–2020 the number of publications could be higher, but the quality of the publications is pretty good. Several collaborative writing projects during the years under review have led to the publication of joint articles, book chapters, and monographs.

Research in the research group focuses primarily on national publication and mainly in Finnish, which is partly inevitable, where the subject is largely national legislation. But the research group has published research in English. One main task of the research group is to provide reliable study concerning national legislation for the business and the society's use. During the period 2015–2020 the research has focused more than before on international themes and international publications. This is a clear, positive change. Taking into account the resources, the focus, and goals of the research, the research group could not focus much more on international publication. A further limitation is that international publishing is currently the province of just the one researcher. This is a clear future risk and it is recommended to expand international publishing in the future to other researchers.

The JUFO indicator numbers of the publications could be better, but considering the research group's available resources, the numbers are adequate. JUFO rating works quite well in business law, especially for level 1, and in commercial law for level 2. In Finland and particularly in the field of business law, monographs are traditionally the most prestigious legal publications. The problem is that JUFO criteria do not fully recognise their significance. The three monographs listed in the self-evaluation report (Annola 2016, Pankakoski 2018, Torkkel 2020) show high-quality research on different fields of business law. Moreover, the members have published different articles on tax law. In the future, the research group should pay more attention to JUFO indicator and as well to external and project funding. A positive effect in number of doctor students (and coming dissertations) will support later performance in publishing. Collaboration in publications and projects is active and will result later publications.

The academic impact of the two main research topics of tax law and commercial law is somewhat modest. This assessment is based on the quality of publications achieved up to 2020 (during 2015–2020). The research group has been very active on the field of non-academic collaboration and other public activities. The impact is significant. On the other hand, the members of the research group should understand that the use of time and energy to non-academic collaboration means less time to be used for research.

8.5.4.3 Quality of research environment

A clear fact is that the Business Law, Information and Knowledge Research Group is very small. Although there are several researchers in the group, only few of them has been productive. This also means that there is much unused potential. If passive members of the research group could be encouraged to actively conduct and publish research, the results could easily improve. Building up national (and of course international) connections and collaboration with other research institutions around academic society will strengthen the quality of research environment. Focusing on, and following, the chosen research strategy will need a vision, leadership and resources. If most of the researchers' work/time is spent in teaching, as it seems to be, there is not enough time to do research. The university should require and make sure that researchers have enough time to focus on research.

8.5.4.4 Future research prospects and recommendations

There are some possibilities to improve the quality and quantity of the research groups research.

- Increase external funding. By expanding external funding, the research group could focus more on research activities and the research group could appoint new researchers.
- Research period. The university (or by external funding) could offer six to 12 months' research period for one or two researcher per academic year. *Recommendation 3:* Continuing national and international collaboration and joint projects.
- Focus on recruitment of doctoral students and postdoctoral researchers on central topics area of the research group and on new innovations as business design.
- Work out a winning strategy.
- Conduct a careful examination of the researcher's workload to determine if any of their current tasks are suitable for transfer to the university administration professionals.

9 School of Technology and Innovations

Panel members: Heikki Mannila, Anders Erlandsson Christiansen, Johan Frishammar, R Carter Hill, Kaushik Rajashekara

9.1 FOCUS AREAS, RESEARCH ENVIRONMENT AND QUALITY OF RESEARCH

For the research assessment, the school presented five research groups:

- Networked Value Systems (NeVS)
- SC Research (SCR)
- Mathematics and Statistics (MS)
- Smart Electric Systems (SES)
- Renewable Energy (RE)

The research groups are quite different. In terms of their subject area, the Networked Value Systems and SCR research groups have some similarities: at some level, they both look at innovations, innovation management, value networks, and related themes. The Renewable Energy and SES research groups are focused each on a core engineering area, and as noted, the Mathematics & Statistics Research Group has a *de-facto* wide responsibility for mainly providing teaching in its fields.

Technology and Innovations	4th stage	3rd stage	2nd stage	1st stage	Other research personnel	Total	% of school	% of university
NeVS	3.2	2.1	3.6	5.5	0.0	14.4	15%	6%
MS	3.0	3.0	1.0	1.6	0.0	8.6	9%	3%
RE	4.0	4.7	2.0	13.2	3.7	27.6	29%	11%
SCR	1.2	1.5	3.0	1.0	0.0	6.7	7%	3%
SES	9.0	5.3	8.3	11.2	2.6	36.4	39%	15%
School total	20.4	16.6	17.9	32.5	6.3	93.7	100%	38%
% of the university	38%	32%	36%	50%	19%	38%		

Table 7. The personnel of the research groups by career stages for 2020.

The School of Technology and Innovations had in 2020 about 38% (93.7 of 249,4) of the total personnel of the university and 38% (20.4 out of 53.2) of the professor-level (4th stage) personnel. Interestingly, the 1st stage personnel, i.e., doctoral students and project researchers, is overrepresented in this school, while the category of other research personnel is underrepresented.

Two of the research groups in the school are large (SES and RE), two are small (SCR and MS), and one is medium-sized (NeVS). While the size of a research group does not have a direct causal link with the research quality, smaller groups tend to have problems that are less prevalent in larger ones.

The panel was somewhat concerned on the resilience of the research activities in each of the groups, and especially in the smaller ones. When a key person leaves, it can have a strong effect on the performance outcomes of a small group. Similarly, sudden changes in the funding situation, in either direction, are more difficult to handle in a small group. Furthermore, these groups cannot provide a wider selection of graduate-level courses.

There are no Master's or bachelor's programmes in the areas of the Mathematics & Statistics group. That group is responsible for the teaching of mathematics and statistics for the whole university.

As publication structures differ between different research fields, comparison among schools is not always very useful. Still, we point out that in terms of the number of publications, the School of Technology and Innovations provided in 2015–2020 almost half (49%) of the publications of the University of Vaasa, and about the same percentage (45%) of the citations.

	Total publications	Total citations	FWCI	Top 10 (%)	% publications of the university	% citations of the university
NeVS	304	4830	1,69	65 (21,4%)	20%	20%
MS	89	995	1,47	16 (18,0%)	6%	4%
RE	114	1808	1,04	15 (13,2%)	8%	8%
SCR	28	324	1,80	7 (25,0%)	2%	1%
SES	256	3202	1,81	60 (23,4%)	17%	14%
School combined	740	10637	1,63	155 (20,9%)	49%	45%

Table 8. The publications and citations of the groups.

The citation indices, FWCI, and Top 10, are clearly above the world average across the whole school, and for most of the research groups. One must, of course, be quite cautious when looking at these indices, as the publication traditions differ between research fields, and as the number of publications is small, leading to sizeable uncertainty in the estimates.

9.2 RECOMMENDATIONS FOR FUTURE RESEARCH

General comments

The role, size, and status of the research groups in the School of Technology and Innovations are quite different from each other, and therefore also the suggestions of the panel are different. The reports on the individual research groups contain detailed suggestions for each group. In this section we have collected the most important recommendations that apply to the whole school.

Research focus

While the School of Technology and Innovations is the largest school at the University of Vaasa, it is still quite small, especially when one considers the large variety of subjects it covers. Thus, each research group must make choices on what to do and what not to do. Such choices can be implicit or explicit.

It seemed to the panel that it would be useful for the research groups to concentrate more on their current or future areas of strength. This could be done with a more careful selection of external projects and from having a school-wide strategy outlining how the current and new strengths are going to be developed. In particular, if the university's strategy is to become more of an international research university, then externally funded projects which goes in that direction should be encouraged.

Recruiting

Recruiting is one of the most important tasks in developing a university. It seems to us that the school (and the whole university) would benefit from a flexible long-term recruiting strategy. New recruitments should be at least partly decoupled from the schedule dictated by retirements. They should concentrate on developing the focus areas, instead of just looking at replacements. Part-time visiting positions of e.g., 20% for leading international scholars may be a cost-effective measure worthy to consider. There should be a way of arranging some seed research funding for the new faculty for about two to three years of research support.

Structure of the school

As noted above, the groups in the school are quite dissimilar. The SCR Research Group is very small, and it might be advisable to consider merging it with another group. The Math & Statistics Research Group has a role in providing basic education in its area, but the research in the group seems to be unconnected from the rest of the university. In connection with future recruitments, the school should consider whether to look for researchers whose areas would be closer to other groups in the university, and/or whose core competencies can be deployed in wider technology and engineering areas.

The SES Research Group has a very wide scope, and the self-evaluation report of the SES Research Group states: "In practice there has been not any joint activities or meetings within the SES group during this period." The panel wishes to note that in particular, the younger researchers benefit a lot from working in a larger group, not only within a single project.

The research groups of the School of Technology and Innovations (and in other schools) are small. This implies that the operations of the groups are fragile, in particular, from the funding point of view: if one or two present sources are discontinued, the result can be a major disruption of the activities

In general, it would be useful if the faculty would be involved in professional societies and increase also in this way the visibility of the groups and the university.

9.3 RESEARCH GROUP EVALUATIONS

9.3.1 Networked Value Systems

9.3.1.1 *Research profile and strategy*

Based on the self-evaluation report, Networked Value Systems (NeVS) is a research group that combines aspects from industrial management (operations management) and industrial systems analytics (industrial engineering). The work is situated at the intersection of technological innovations, business, and management. Research themes of the group include strategies, processes and practices within industrial value systems, networks, and firms. Questions studied include the future of operations, how technology shapes industry, how new services are built, and how competitiveness can be maintained in a changing environment. The research group intends to develop both theory and practice and work closely with all three university research platforms on themes related to digitalisation, innovation, and energy. The research group addresses scientifically relevant and original research questions in their field. It also contributed to new knowledge in the area to a reasonable high extent.

The NeVS Research Group seems well positioned regarding research topics and research questions. The members of the group collaborate with all three platforms of the University of Vaasa on themes relating to energy, innovation, and digitalisation. The key projects include AVANGARD (on future and novel technologies for the automotive industry), AIKO-FOM (on electrical vehicle battery manufacturing), and REBUS (tools to visualise container stowage). The AIKO-FOM is a great example of a research project that has also created direct societal value for the city and the region. The cloud manufacturing ecosystems project reported in the impact case is a good example of combining advanced research with real business and societal value. The key projects listed all address topics and research questions at the forefront of industrial development. A review of their publications in peer-reviewed journals over the period also makes this clear.

9.3.1.2 Volume and quality of research activities and impact of research

The NeVS Research Group is productive and publishes in good academic journals. Over the evaluation period, NeVS has published a total of 304 publications, including 192 scientific articles (an average of thirty plus per year), some 100+ conference papers, plus thesis and book chapters. Given the group size of about nine this is quite impressive, though the contributions of externally associated researchers and the 'network effects' they create must be factored in. Some of the research group's scholars are highly cited.

The research group has publications in high-status international journals, such as *Research Policy*, *Journal of Product Innovation Management*, *Journal of Business Research*, and *Industrial Marketing Management*. The group is doing well in publications, but is not world class. This is reflected in the total publications for 2015–2020. About 88% of the publications are 'International publications', and over 65% are co-authored with international researchers according to the SciVal report on Scopus publications.

Over the period of 2015–2020, the group had external research funding of about €3 million from a variety of funding bodies, including Business Finland, Academy of Finland, from the EU, and directly from industry. This mix of funding bodies makes the group resilient and is a core strength. The research group collaborates with all university platforms. It contributes to scientific conferences, as opponents or reviewer of PhD thesis, and engages in international research visits. The size and scope of these activities seems reasonable given the group size.

For the period of 2015–2020 the research group had significant international, national, and regional research projects and collaboration. The industrial cooperation in the group is active, as in the whole university. The research group works with companies such as Wärtsilä, ABB, Hitachi, and Danfoss in research projects. The research group also has a rather well thought out strategy for using M.Sc. students as a form of academic and non-academic collaboration. NeVS collaborates with cities/municipalities/regions, like Vaasa and Seinäjoki. The projects and collaborations are an important asset for the group and for the university. Collaboration within the University of Vaasa seems satisfactory overall. The research group is also present in scientific networks and organisations and seems to be making significant contributions to society (i.e., outside academia).

According to the SciVal report, the research group published 304 (Scopus) publications over the evaluation period, and these were cited in total 4,830 times. These numbers are hard to compare to other similar research groups, and 'new knowledge' may very well be something practical too (as per the impact case) which is not captured in citation patterns. However, the field-weighted citation impact of 1.69 may indicate the group to be above average, as could the number of publications in the top 10% most cited publications (21.4% for this SG). Research is high-quality in terms of volume, but there is room for improvement in the quality of publication outlets. The research group has a broad network of international collaborators and engage in international collaborations in publications to a good extent.

9.3.1.3 Quality of research environment

According to the self-evaluation documents there is currently one full professor, two associate professors, two assistant professors, three lecturers, and three university teachers plus project researchers (often doctoral students). For the evaluation period, there was an average of 9.1 persons in the group plus many externally contracted researchers (in total 81, with an average of 13.5 per year). The group themselves highlight the need to hire at least one more full professor given obligations to manage multiple M.Sc. and B.Sc. programmes. The competence structure of the group is good on most levels (though one more full professor may strengthen the group). Its scientific expertise is also good and covers multiple relevant areas.

The NeVS Research Group has a clear 'pyramid structure' with both full professors, associate- and assistant professors with tenure track profiles, junior researchers, PhD students, and associated external researchers. The group is also quite diverse in terms of competences and research areas. There is systematic collaboration with international partners in many of the research projects, and very extensive international collaboration in wider publication and co-writing activities on a scholar-to-scholar basis which is underscored by the analysis of Scopus publications via the SciVal report. NeVS has good international collaboration and networking and sufficient research leadership. Moreover, the financial resources (external funding) seem at a good level and it is a strength that they come from a variety of funding bodies.

9.3.1.4 Future research prospects and recommendations

In the self-evaluation report the group says, "Building stronger international research networks should be the focus in the coming years", i.e., to allow for larger applications and more diverse partner consortia. The research group however has a good starting position regarding both financial and human resources, and a productive research environment. One more full professor could strengthen the group and aiming for more high-quality publications would strengthen the group and align with the strategy of the University of Vaasa. The group has the potential (or at least the basic prerequisites) to carry out high-quality and impactful research, but would benefit from higher ambitions regarding the quality of publications outlets.

9.3.1.5 Suggestions to the University of Vaasa and to the school

NeVS is overall a productive research group that adds value to the School of Technology and Innovations, to the platforms, and to the university overall. The research group is adequately funded, has good regional-, national-, and international networks, and publishes research in international journals. The group is also sufficiently large to be resilient over time. The panel have the following suggestions for future development:

- Having more teaching-oriented faculty joining research projects and vice versa could produce a more resilient and productive research group.
- Analyse the need for potential recruitments, in particular another full professor and/or senior expertise to manage larger applications from EU, educational programmes, and to provide complementary research leadership.
- Given the strategy of the University of Vaasa, NeVS should try to aim at higher levels with its publications. There may however be a trade-off doing applied and industry-relevant projects and publishing in the very top academic journals, and this trade-off is important to be aware of.

9.3.2 SC-Research

9.3.2.1 *Research profile and strategy*

According to the self-evaluation report, SCR Research Group (SCR) is an industrial management research group of the University of Vaasa located in Lapua, South Ostrobothnia. The SCR Research Group has been part of the university since 2012. As a project-based research group, it has covered all the costs through externally funded research projects. Its core competence areas are service innovations, demand- and user-oriented innovation initiatives, competence-intensive services, service businesses in industries, competence protection and management, as well as the management of development and innovation operations.

Over the evaluation period, the SCR Research Group has focused mainly on various facets of service innovation (which multiple other RGs at Vaasa also do), and current and future research themes centre on managing risks in digitalisation and management of food waste. The major research projects for the evaluation period seem relevant and original. The NOMAD project addressed user-driven service innovation processes and co-creation; the SOPPI project focused on utilisation of open data in the service innovation context. The iREN project (a bit more applied than the other two?) focused on enabling technologies for industrial renewal.

9.3.2.2 *Volume and quality of research activities and impact of research*

The SCR Research Group has published in leading outlets such as *Research Policy* (de Jong et al., 2015), *Journal of Production Research* (Yang & Litang, 2015), *Technological Forecasting & Social Change* (Guo et al., 2018), and *R&D Management* (Weckowska et al., 2015).

In total, eight journal articles were published over the period along with book chapters (10) and conference papers (10). In terms of citations, there were 324 citations to

the group's publications over the period of 2015–2020. This is quite modest, even taking group size into account. The field-weighted citation impact (1.80) is, however, above average, but the small number of papers means that even a single article can have a large influence on the result. Some 90% of total publications are 'International publications', and over 50% are co-authored with international scholars. Some articles have been published together with internationally leading scholars, like Eric von Hippel of MIT. The relatively few academic articles and the relatively large number of conference papers and book chapters calls for better pipeline management (i.e., a work process for converting intermediate products into journal articles).

Externally funded research projects and collaboration is reasonable given the group size. The group had externally funded projects of about €580.000, mainly from Business Finland and regional funding bodies. The NOMAD project is a good example with potentially high impact; focus was on user-driven service innovation processes.

The SCR Research Group notes in its self-evaluation report that historically the collaboration within the University of Vaasa has been occasional and rather limited, but that the situation has greatly improved. The self-evaluation report notes still that there is a need for improvement regarding collaboration, e.g., with the university's platforms. The SCR Research Group is active in international conferences and international research visits to and from the University of Vaasa. These are important antecedents to output measures, like academic publications. The research group also has contacts with local businesses in the regions of Seinäjoki & Vaasa, based on research, and in mid- and northern Sweden. The quantitative part of the self-analysis also lists regular exchanges with local NGOs and private companies. Research dissemination of results takes place within the frames of existing projects.

The research group engaged in important collaboration to an acceptable extent. Alignment with other research groups and platforms at the University of Vaasa can likely be improved. Non-academic collaboration is difficult to evaluate, but research dissemination also outside research projects (like regular workshops, a practice-oriented seminar series, etc.) could help strengthening local networks and create new project ideas and partners for project applications. The SCR worked on relevant and original research questions over the evaluation period. The group may be doing okay if group size is considered, but it seems an overstatement that the research group has contributed 'significant new knowledge' in its area of research.

9.3.2.3 Quality of research environment

The SCR team is small. The staff includes a research manager at 50%, two associate professors (100%), one researcher (100%, but on maternity leave), one researcher (50%), and one project researcher (100%), so about five persons in total; varying between 2.7 (2016) to 6.7 (2020) over the period. No external researchers seem to be affiliated with

the group. The small size of the group leaves the group vulnerable, e.g., with negative impact on research funding and publications when key staff left the group. At time of writing this (November 2022) there is no full professor in the group as per their web page.

Over the evaluation period the group has produced high-quality research. But some key staff has since then left the group. The current scientific expertise of the group is low, at least if scientific expertise is measured by peer-reviewed journal publications and citations to those publications. There are highly cited outputs, but the citations are mainly to patents. This implies that the work has impact, but not through the most traditional route. A full professor providing academic leadership and with experience in receiving external grants is clearly lacking. It is difficult to see the SCR Research Group blooming or expanding without new recruits and/or an inflow of more personnel. An alternative could be a merger with another group. Financial resources per capita may be okay, but the group is likely too small to make a productive and resilient research unit over time. The scientific expertise of the research group can be improved through international collaboration at a reasonable level given the group size.

9.3.2.4 Future research prospects and recommendations

Does the research group have potential to carry out high-quality and impactful research in the future? The short answer is no. The group lacks academic leadership, is too small, and has challenges attracting funding which allows it to produce impactful research. The research group notes themselves that the reorganisation of Business Finland has impacted the group negatively, and notes that "...the costs of producing scientific articles cannot be financed by these programmes." (referring to regional ERFD programmes).

The research group would benefit from funding that is more research-oriented and which aligns with its publication strategy. It needs academic leadership, and it needs to grow (or perhaps dissolve). It is of course debatable exactly how large a group should be to be viable over the long term, but the panel is convinced that five persons is way too small.

9.3.2.5 Suggestions to the University of Vaasa and to the school

The SCR Research Group seems to have covered all its costs through externally funded projects over the evaluation period, which is a strength. They also have some staff that has been around for multiple years and have a history of publishing some articles in better academic journals.

In the self-evaluation report it is stated that "The future of research group looks promising". The evaluation panel is less certain about that. The SCR Research Group is a small and vulnerable group which currently lacks sufficient academic leadership and whose research also overlaps other research groups at Vaasa (NeVS and research

at the School of Management). The SCR Research Group's operations also seem a bit misaligned with its own research interests, and it is not assuring that the self-evaluation report has been prepared by the former development manager who is no longer with the group. The panel have the following suggestions for future development:

- Recruit a full professor with strong merits in academic publishing and research application writing, including creating a research programme for such an incoming professor (e.g., two or three PhD-students) which can supply junior competence and energy.
- Alternatively, consider merging the SCR Research Group with another research group at the University of Vaasa and/or allow individual researchers at SCR to join other research groups based on their individual competences and research interest to make more productive use of its human resources.
- Initiate a discussion at the school or university level regarding research profile and focus. The university may win by more thoroughly coordinating the research on service innovation currently conducted in multiple research groups.

9.3.3 Mathematics and Statistics Research Group

9.3.3.1 Research profile and strategy

According to the self-evaluation report,

"The research group consists of three smaller research teams working in the following three main disciplines: (a) Mathematics, (b) Business Mathematics, and (c) Statistics. Each sub-research group has its own area of research expertise. In the evaluation period 2015–2020 the key topics in research can be classified as follows. (a) In Mathematics the research belongs mainly to the area of mathematical analysis. (b) In Business Mathematics main research topics include the application and development of new stochastic calculus for mathematical finance, research in fractional and Gaussian modelling, especially fractional Brownian motion. (c) In Statistics the research is oriented in the areas of finance and applied econometrics, utilising empirical modelling in finance, accounting, marketing, etc."

The research group is small: in 2020 there were 8.6 person-years in total, and at the senior level (professors, associate professors, lecturers) 6.0 person-years. Thus, the group is less than 10% of the school. The subthemes have on the average about three persons.

There are no Master's or bachelor programmes in mathematics in the University of Vaasa. The members of the Mathematics and Statistics Research Group teach all the courses in the area for all schools in the university. The research assessment exercise

material did not contain detailed information about the teaching load, but according to the interview the load is high, even very high for some members of the research group.

There seems to be a limited collaboration with the other groups, school, or the university. The research in the group is done collaboratively with people outside the university. The research group thus has the role of providing the necessary teaching in its areas for the university, without being strongly connected to the research done elsewhere in the university.

9.3.3.2 Volume and quality of research activities and impact of research

The quality of research from the group is high. The publications list shows 74 papers during 2015–2020, or 12.3 papers per year on average. For a research group with such a small number of members, 13 members listed on the publication's summary spreadsheet, this leads to an average of 5.7 publications per researcher. With the professors engaged in extensive service and all with teaching duties, this seems very good, given the publication practices of the area.

The volume seems even better when considering that the research team in practice has had about eight person-years per year, including doctoral researchers. The reality is that there are three professors and two to three additional researchers (Associate Professor, Senior Researcher, Senior University Lecturer, University Lecturer). The number of articles increased from the early period to the later period, after 2018.

In addition to mathematics theory journals there are contributions to statistics journals, business & finance journals, and economics journals. The publications summary lists 73 publications that were co-authored in some way. The research group publishes largely (90%) in refereed international journals. The quality of the mathematics publication outlets is good or very good. The number of articles was 55 which was 74.3% of the total number of articles. 66 of the contributions were in international publications and 50 were in Open Access journals.

The list of five most important publications shows interesting and potentially path-breaking work in math, statistics, and finance. The areas of these selected publications vary: a book on operator techniques for boundary value problems and spectral theory, papers on block operators and stochastics, and one with a more applied theme (a test for abnormal situations in long-horizon event studies) in the *Journal of Empirical Finance*. Describing the themes from another point of view, the list has three papers that extend and generalise fundamental knowledge, and which are published in excellent journals. The fourth paper attacks a problem in finance that in one way or another could affect all of us, through our savings and retirement plans. The fifth item listed is a monograph published by Springer that already has a meaningful number of citations. The publication outlets of these papers also show a goal for visibility.

In addition to the obvious interactions with the business school, its collaboration with the hospitals is important and a direct benefit to society. Furthermore, Mathematics and Statistics (with computing and numerical analysis) are the foundations for almost all knowledge gains in every field. Think of Economics, Finance, Marketing, Physics, Health (biometrics), History (cliometrics), psychology (psychometrics), Education, Engineering of all types, and so on and so on.

The list of their scientific activities is extensive, beginning with the Academy of Finland work by the mathematics professor. The three professors are each associate editors of internationally recognised journals. The research group reports 221 activities during the period. These include both assignments as referees and discussants at conferences, reading those between the lines, and reviewers of dissertations. There were 50 research visits, with more before 2018 than after. Each of the professors is on editorial boards of journals, and the professor of mathematics has been a member of the Academy of Finland for 3 years, a very prestigious recognition. The research group self-evaluation report includes a list of international collaborations in publication projects and the list both within Finland and with European and U.S. partners is impressive.

9.3.3.3 Quality of research environment

As mentioned above, the group is small. It currently performs well in providing the university with the teaching in mathematics and statistics that is needed, and at the same time producing high-quality research in areas which are not very strongly connected with the rest of the university.

The current resources are not compatible with developing an internationally recognised research group. The group needs additional positions for junior faculty and PhD/MS students. Having the entire university rely on three professors is unrealistic. For academic recognition, size matters. It matters because university rankings are based on the number and quality of publications, not on a per capita basis. Research mass is accumulated through department and college synergies. PhD students and colleagues from across the university are helped during open office hours. The availability of someone just down the hall to answer a question requires that there are people down the hall. This is especially true for technical areas. The test should be whether researchers can read and understand the SAS or Stata documentation. Doing so requires both mathematics and statistics knowledge and training, or help.

The three professors, and the other researchers, have excellent records and are clearly experts. The structure is difficult to evaluate. The professors have administrative duties. There needs to be more junior faculty, post-doctoral, and PhD students to develop a real international research presence. The research groups work well as it is, but it needs more personnel. Academic recognition and reputation are increased by the number and quality

of publications. On a per capita basis research group is 'world class' and is producing as much as possible given their resources.

9.3.3.4 Suggestions to the University of Vaasa and to the school

In the Research Evaluation Assessment 2022 document, the first statement, below "Strategy—research excellence" is "The main vision of our 2030 strategy states our university to be internationally recognised as a high-impact research university." Modern business, especially large-scale business linked to energy technologies, requires the ability to analyse large amounts of data and interpret it correctly. It is essential that statistics and data analysis, with linkages to mathematics, numerical analysis, and programming, be part of this equation. The University of Vaasa is understaffed and underdeveloped in these areas. It is very disturbing that in the Self-Evaluation Report for the School of Technology and Innovations that Math & Statistics is not mentioned at all. This leads to conclude that the fine scholars in the research group have no home. The question is, where should they be? It should be noted that suggestions by the previous evaluation team have not been implemented.

The university needs to make a choice on how it will develop the area of mathematics and statistics. This decision obviously cannot be made based on research consideration only, as the educational needs must be taken into account. There seems to be at least three possibilities. Schematically, they could be described as follows. The first one is to continue as today, with about the current size of the group, and not aiming for a larger research interaction with the rest of the university.

The second one is to commit some new resources to the area, and in the recruitments stress the potential interaction with the other research groups in the university. That is, when filling a vacant professorship, or when creating a new one, look for candidates who have already expressed an interest in also working in applied areas represented in the other three schools of the university.

The third one is to expand the group considerably, emphasising the possibilities given by the current strong development in the interrelated areas of mathematics, statistics, data analysis, and machine learning and other areas of artificial intelligence. Also, in this possibility the key driver would be to search for people who are interested in working together with the high-quality researchers in other schools of the university. Developing an educational curriculum in, say, data science, could also be a possibility.

In the second and third options above the difficulty is in finding the excellent people needed. Currently, the (industrial and academic) job market for researchers in computational methods is very hot. For the University of Vaasa to be attractive in finding excellent researchers in this area it would be very useful to have a long-term view on what the university plans to do.

9.3.4 Renewable Energy Group

9.3.4.1 *Research profile and strategy*

The Renewable Energy (RE) Research Group consists of two subgroups. One focuses on power production with internal combustion engines (Engines and Fuels) and the other, primarily, on geothermal and building-related energy (Geoenergy). Energy Technology is the main discipline of the group.

The Renewable Energy Research Group closely collaborates with the Vasa Energy Business Innovation Centre (VEBIC) platform. This collaboration is essential for all experimental activities since the research infrastructure is 'owned' and operated by VEBIC. Researchers from the following research groups participate in Renewable Energy Research Group projects on a case-by-case basis: Smart Electric Systems, Strategic Business Development (School of management), SC-Research, and Networked value systems.

Within the Engines and Fuels group, the focus areas are renewable engine fuels, technology of internal combustion engines, improvement of the fuel conversion efficiency, and the abatement of both global and local emissions.

Several of the key publications has contributed significantly with new and relevant knowledge. The selected focus areas are the right ones, but very broad. It is important to strategically define where the group shall focus deeply to make an impact, be competitive, and bring knowledge that can help accelerate the green transition.

A major achievement for the group was the design and build up of the unique VEBIC Fuel and Engine laboratories between 2015 and 2017. This asset will be instrumental in generating real data on the combustion process, its emission, efficiency, and the effect of renewable fuels on the performance.

The focus of the Geothermal subgroup is on shallow geothermal energy, water and sediment heats, asphalt energy, deep and medium-deep geothermal energy, and the improvement of the energy efficiency of buildings. Thus, the two groups have not so much in common. The geoenergy studies have investigated the availability of sediment and sub-asphalt heat through long term temperature measurements and tested various circular economy materials improving the energy collection area. It appears there is no roadmap for the team and it is difficult to assess based on the material if the right questions are researched.

9.3.4.2 *Quality of research activities and impact of research*

The group produced 169 publications during the years 2015–2020. Considering the group size and number of employees this is regarded as a good achievement with high productivity.

From a publication citation report is based on 114 publications in the Scopus database. The difference between the 169 entries in the publication list and the 114 in Scopus database is large. Looking at the list of publications, there indeed seems to be a rather heavy bias towards publishing conference papers or in lesser-known journals. In the higher end we find Energy or Applied Energy publications which are excellent outlets. The group has good collaboration within the university across disciplines. The citation indices for the group between are somewhat below those of the other groups in the School of Technology and Innovations.

The industry collaboration seems to working very well, with frequent and fluent communication between the research group and the industry. One can speculate that the group has devoted most of its energy to the industry collaboration, perhaps in some cases at the expense of preparing the best possible publication from their research efforts.

9.3.4.3 Quality of research environment

Based on the shared material, the group is in a good place in terms of speed and direction on its way to become an internationally recognised partner in the Engines & Fuels field of research. Basic funding is in place for both personnel, tenure track re-growth, and for the unique experimental facility through the VEBIC platform. The generation change needs to happen smoothly to enable continuous operation and a successful transition into the next phase for the group.

The roadmap for future research and development of the group is under construction and the result will be very interesting to follow. Currently, the timeline only runs up to 2026 which might be a little short to carry though a strong vision for decarbonisation of shipping and energy supply.

Continuous work is being done to develop international collaborations, many a time through EU-projects and through getting known for solid publications.

The work environment seems to be open and supportive with clear targets for the researchers. Some care needs to be taken to monitor and manage workload which appears to be a bit heavy from time to time. Support is given to do international exchanges and teaching is not part of the normal duty for the PhD students.

9.3.4.4 Future research prospects and recommendations

Within the selected, highly relevant research topics of decarbonisation of transport and energy supply, the Renewable Energy Research Group has the potential to carry out high-quality and impactful research in the future, particularly related to hydrogen-based fuels. There is a good foundation with access to unique experimental facilities for various fuels

applied to medium speed internal combustion engines and a platform of knowledgeable people and important projects up and running. In addition, the financing situation seems to be on a favourable track.

To success in the next phase of the group's operation and development, it is proposed that:

- The research and team development roadmap is further developed to extend beyond 2026 to represent at least two PhD project generations and one tenure track development cycle.
- Clear targets are established for the development of the team and experimental facilities with financial commitments from the school and industrial partners.
- A shift in focus is considered to place publications more frequently in journals with open access, to achieve wide international recognition.
- Experimental data from the medium speed engine facility is made public in a data base for the academic society to use and collaborate around.
- Collaboration with international parties is continuously developed and supported by the school.
- The unique experimental facility is utilised extensively to produce valuable data that can be shared with the research community.
- The work on mutual adaptation of fuels to engines and engines to fuels is continued and intensified.
- Platform collaboration within VEBIC is further developed to involve more external parties across the EU.

9.3.4.5 Suggestions to the University of Vaasa and to the school

To support the development of the Renewable Energy Research Group it is proposed that the University of Vaasa and the School:

- Invest in the development and maintenance for the Renewable Energy Research Group. This is the single most important topic for the next 20 years globally and certainly for the Vaasa region – the backbone of the business society and creation of growth and employment opportunities.
- Look into extending the scope of the research group into other components of the renewable energy supply chain, maybe offshore wind?
- Supports the research group during the generation change of the leadership by adding financial resources and at least one new faculty resource to handle joint teaching and research duties and additional administrative support.

- Supports the development of the VEBIC platform and its collaboration potential both externally and internally. The collaboration between Renewable Energy Research Group and VEBIC is important.
- Sets clear long-term targets for the research group and allocates means and resources in proportion to the ambition level.
- Establish a uniform set of inspiring, shorter term KPIs that can be applied across the university and discussed, understood, planned for, followed up. and acted upon across the faculty.
- Secures the operation and maintenance of the VEBIC infrastructure.

9.3.5 Smart Electric Systems

9.3.5.1 Research profile and strategy

The Smart Electric Systems (SES) Research Group has a very wide scope. Quoting from the self-evaluation report:

“The Smart Electric Systems (SES) research group is a multidisciplinary group consisting of the following disciplines: Automation, Electrical Engineering, Information Technology, and Telecommunication Engineering.

In Automation, the main research topics in the period from 2015–2020 include signal processing, especially image processing and its applications, optimisation and search by evolutionary algorithms, and hardware implementation of algorithms to the above in the form of Field Programmable Gate Arrays (FPGA).

In Electrical Engineering, the research is focused on power engineering topics. In the 2015–2020 period the research activities focused on the Smart Grids with wide variety of specific topics: new protection solution for distributed generation, fault detection and condition monitoring, integration of distributed energy resources on the electricity distribution system, management of flexible energy resources, energy storages in marine applications, etc.

In Information Technology (nowadays divided into the disciplines Computer Science and Information Systems Science), the research topics include research of computational methods focuses on solving various modelling, simulation, and optimisation problems applying particularly intelligent computational methods. In telecommunication engineering, the research topics in the 2015–2020 period from included machine learning, wireless communication, biotechnology, substation automation standard IEC61850, cybersecurity in smart grids, distributed intelligence, and wireless automation.”

As mentioned in the self-assessment report, the name of the research group does not accurately represent the overall activities of the group. Compared to its size, the group has many areas, and it does not have enough faculty to cover all the research areas listed. For example, there appears not be faculty in some of the areas of research mentioned in the web site, such as controls, electromagnetism, and antennas

Continuing to quote from the self-assessment report:

“During the period 2015–2020 there has been major changes in the organisation of the university. Essentially the research groups have remained, but without any organisational role. In practice there has been not any joint activities or meetings within the SES group during this period. Each new PhD student needs to be associated to a research group, but for them there has not been activities arranged by SES group. In practice the research activities are conducted mainly within projects, smaller teams, and under the supervision of professors.”

Thus, the SES Research Group seems to be an umbrella organisation for weakly interconnected smaller units.

In the interview, it was stated that the smart grid is the connecting technology for the group. This characterisation seems to be possibly promising goal for the future, but the panellists are unsure of how much it describes the current situation and whether there is any movement towards that goal.

In 2020, the group had 36.4 person-years, of which 14,3 person-years are at the professor, associate professor, senior researcher, or lecturer level. This makes the SES Research Group by far the largest group in the school and in the university: it contains 39% of the personnel of the school and 15% of the personnel of the university.

9.3.5.2 Quality of research activities and impact of research

We start from the impact case presented in the evaluation material. It is the Sundom Smart Grid project, a living lab environment employing modern smart grid technologies and renewable energy sources. The idea is good and the project seems to be working well. This has helped to increase knowledge, capabilities, and strategic effectiveness at the University of Vaasa, and also helped to increase external funding and international collaboration. This type of project activities should continue. The group apparently has quite good industry connections to, e.g., ABB and are also collaborating extensively with other Finland companies.

The reseaech group has overall increased the research publications from 25 in 2015 to 101 in 2020. However, the number of publications per year vary a lot. The trend was not

discussed in the interview. Even Open Access publications have increased from about 5% in 2015 to more than 50% in 2020. The lowest year was in 2017. Overall citations of 3202 from 2015 to 2020 is low. After 2015, it followed the same trend as publications, dropping year by year, until it began to pick up in 2019.

However, the Field-Weighted Citation Impact (FWCI) values are good, above 1, even reaching 2.5 in 2019. This indicates the quality of the research papers are good. Also, the top 10 index is quite high, 23.4%. While the publication numbers from the early years are small, the index has stayed high even with the rapid increase of the publication count in 2019 and 2020.

Looking at the publications in Smart Electric Systems from 2015 to 2020, publications from international collaborations correspond to 67.5% of all publications of the group. The FWC index 2.16 is higher than for the other publications.

The list of collaborating institutes contains 135 entries. For a small university like Vaasa, this seems to be very high. Even major universities in the worlds may not have these many collaborations. Of the 256 publications, University of Porto is a collaborating institution in 103. This raises questions about the type of international collaboration.

There is in general a positive view of the corporate collaboration on electrical engineering in University of Vaasa. Given this, the number of academic-corporate co-authored papers is not high, only 14 out of 242 over six years, or 5.5%. This might be due to the lack of interest in the industry, and to a clear division of labour between the university and the companies.

9.3.5.3 Quality of research environment

In the self-assessment report of the SES group, there are no answers to the questions related to the research environment (from “How have you worked towards strengthening research leadership?” to “Are there new initiatives or wish for support in academic collaboration”). These questions are all very important, and the lack of the answers and the discussion at the interview support the view of the SES as a weak umbrella organisation.

The external funding of the group seems to be good: an average of about €200,000 per year of funding from Business Finland, about €110,000 from industry, €60,000 from the Academy of Finland, and about €350,000 from ‘Other external research funding’. Most of the research activities have been based on national funding sources and close collaboration. Moreover, there seems to be funding from European Regional Development Funds. In addition, various foundations are funding directly to PhD students. We lack the data on how the external funding is distributed among the (quite independent) subgroups of the SES Research Group.

Given the heterogeneity of the group, it is hard to evaluate the research environment.

9.3.5.4 Recommendations

The first question to be asked is whether it is useful for the university and the school to consider this group of activities as a research group. As discussed above, it is quite different from the other research groups, as it lacks internal cohesion and all the usual activities of research groups. For the university, it might make sense to lump these weakly connected themes together: even a weak structure can be better than none.

A wider question is the choice of topics. The themes currently under the umbrella of the SES Research Groups are wide, of great general societal importance, and of large interest for the industry. Given the self-evaluation report, the publication numbers, and the data on external funding, there are hotspots of interesting and high-quality work in the group.

The university, school, and the research group clearly need to have a vision for the future research strategies so that number of research publications and quality will continue to improve. Given the many research themes inside the groups and the size of the university, it seems impossible to obtain a high level of activity for all the themes.

Importance should be given to the publications by the faculty with the research students at the University of Vaasa. Also, it should not depend on one faculty.

There are too many areas of research for a small group like Smart Electric Group. Maybe, it would be good to focus on a few research areas and be recognised internationally in those areas of research.

10 Platform Level Evaluation

Panel team members: Heikki Mannila, Anders Christiansen Erlandsson, Bruno van Pottelsberghe

The platform structure is quite a recent addition to the University of Vaasa. The three research platforms were founded in 2018 and, thus, they are organizationally young and their modes of operations are still developing and they differ quite a lot from each other. The goal of supporting multidisciplinary research is laudable. Here we use the term multidisciplinary as an abbreviation for multi-, cross- and interdisciplinary.

The three platforms are quite different, and they are also in different stages of development. The VEBIC (Vaasa Energy Business Innovation Centre) platform seems to have a clear role in providing infrastructure services for the energy research and education. The cooperation between VEBIC and the research groups seems to be working well, and the division of labour is clear. The two other platforms are not yet as clearly defined. The discussions with the research groups and schools showed uncertainty and differing views about the current and future role of these platforms.

Multidisciplinary work needs organisational support, and structures such the platforms have been introduced in many other universities. Our experiences show that high-quality multidisciplinary work needs disciplinary excellence. Hence it needs continuous strong connection to the disciplines it is based on. Thus, structures for supporting multidisciplinary research seem to work best when they either have a clearly defined task related to infrastructure etc., or when they are lightweight umbrella organizations that support the work done at the disciplinary units.

10.1 DIGITAL ECONOMY RESEARCH PLATFORM

The Digital Economy research platform is a multidisciplinary open platform that focuses its activities on digital technologies and the impact they have on businesses, individuals, and organizations. The mission is based around global change, including its related challenges (e.g., climate change, cyber security) and key trends (e.g., digitalization, platform economy, exponential technologies). The specific research interests of the platform and focus areas include data and innovation, digital organizations; platforms and demand-side economics of scale, and framework conditions for the digital economy in Finland and the EU.

The research activities between 2018 and 2020 were divided into the following research programmes: (1) sustainable data business, (2) power ICT, (3) space data economy, and (4) digital governance.

In the self-evaluation report, the platform describes its roles as “connector, collaborator, and leader”. The description continues:

“As a Connector, Digital Economy helps with finding partners (company, university, other), disseminating researchers’ findings (e.g. sponsoring/promoting public events) and promoting open science. As a Collaborator, Digital Economy has been involved in research projects that are being led by a team or individual at one of the schools or other platforms. As a Leader, Digital Economy has been in charge of creating new projects that will be led by the platform. These projects preferably include schools and other platforms as collaborators. Digital Economy has been active in all of these roles and has targeted competitive, external funding from the EU.”

The Digital Economy platform is, as with all platforms at the university, quite new, and there is not much empirical evidence on how it functions. The theme of the platform is obviously important, as digitalization has an impact on most areas of society. Also, from the point of view of the research agenda at the University of Vaasa digitalization is highly relevant. The platform’s research programmes seem to be located in areas which are either currently among the key fields of research at the university or have the potential to become key fields of research at the university.

The positioning of the platform with respect to the school and research groups seems to be good. The roles of connector, collaborator, and leader are all needed, and **the platform seems to be striving towards a flexible collaboration with the schools and research units.**

10.2 VEBIC RESEARCH PLATFORM

The VEBIC (Vaasa Energy Business Innovation Centre) gathers internal and external stakeholders of the university to strengthen the work in the strategic focus area of research in energy transition and sustainable development. The platform implements a public-private partnership including research infrastructure, industry-sponsored professorships, joint research programming, and different co-operation models and contracts. VEBIC has laboratories for boosting future fuels, internal combustion engines, and future reliable electrical and energy system integration research.

The current research programmes are future resilient energy systems and energy transition management. The operation of the platform has changed considerably in the last few years, and the new strategy has been created for the platform.

In the written materials and in the interview, the VEBIC platform gave a very informative description of the relationship between the platform and the schools. The modes of participation between different schools and commercial companies in the planning and implementation activities of the platform are clear.

Based on the discussions with the platform and with the research groups, **the VEBIC platform seems to have very useful roles both in running the laboratories and in organizing the collaborations** between research groups and external partners. The University of Vaasa and VEBIC inside it have managed to implement a flexible format (or formats) of industrial cooperation. This is clearly one of the strengths of the university.

10.3 INNOLAB RESEARCH PLATFORM

According to the self-evaluation report,

“InnoLab is a phenomenon-based, multidisciplinary open research platform with focus on open and user innovation, entrepreneurship, and public sector innovation and renewal. InnoLab also encourages the application of citizen science, open science, and design thinking. The goal of InnoLab is to create innovative and unique research and to promote new ways of doing science through inclusion, creativity, reduced hierarchies, and active citizens. InnoLab invests in dynamic cooperation with its external partners and in communication that is interesting and inviting to all types of audiences.”

The research themes are introduced in the self-evaluation report by

“Work is organised around three thematic clusters capturing innovation activities at all levels:

- *Society & Systems: Driving sustainable transformation through public policy*
- *Transformational Innovation: Orchestrating industrial renewal & organisational change*
- *Consumer & User-centric innovation: Capturing innovation opportunities”*

The plans for 2021/22 and 2023/24 include onboarding new tenure tracks and staff, and to start international collaborations and research exchanges.

Innolab is the youngest of the three platforms. It has also gone through changes in its leadership in the last few years. Given the short history and the organizational and thematic changes, it is not surprising that **the role of the platform seems to be still at a formative stage.**

The research themes of the platform given above are wide, and it is not quite clear where the focus of the platform is or is going to be. Based on the interviews with the research groups, the role of this platform with respect to the schools seems to be somewhat unclear: is it a unit that fosters collaboration, or is it (or does it want to become) a

research unit of its own, independent of schools and research groups? The general theme of innovation research is represented in the University of Vaasa: there are several research groups where it is actively studied, and Innolab is also a major unit positioned in this area. It seems that it would be useful to look in detail at the organization of research into this theme.

10.4 OBSERVATIONS AND RECOMMENDATIONS

The overall goal of the platforms seems to be to improve multidisciplinary activity and collaboration within the university and also with the wider society. This goal is obviously useful. Given that the platforms are a recent addition to the structure of the university, it is not surprising that their work and organizational model are still developing. One should also remember that there is no definite need to have all the platforms operate in the same way: the different areas of research and societal interaction need different types of support. For example, the role of VEBIC in operating the research infrastructure requires different type of staff than the other platforms.

It is to be expected that the platform concept and its implementations will continue to develop. Given the small size of the university, it might be best **if the platforms would have a supporting role in the service of schools and their research groups, and they should not try to form a research identity of their own.** Given that researchers can be affiliated with both a school and a research group, as well as with a platform, it seems that this would be a flexible organization. The panels heard many comments on the subject of whether the platforms should recruit their own permanent faculty. The recommendation is that professor-level recruitments should be done within the schools and research groups rather than on the platforms.

11 Appendixes

Appendix A: Expert panels of the RAE

University Panel

Chair, prof. Heikki Mannila, Aalto University, Finland
prof. Ulf Andersson, Professor, Mälardalen University, Sweden
prof. Agnes Cheng, The University of Oklahoma, USA
prof. R Carter Hill, Louisiana State University, USA
prof. Anne Kovalainen, University of Turku, Finland

Panel of the School of Accounting and Finance

Chair, prof. Agnes Cheng, The University of Oklahoma, USA
prof. Lawrence Kryzanowski, Concordia University, Canada
prof. Mikko Puhakka, University of Oulu, Finland
prof. Seppo Villa, University of Helsinki, Finland

Panel of the School of Management

Chair prof. Anne Kovalainen, University of Turku, Finland
prof. Christopher Fox, Manchester Metropolitan University, UK
prof. Bruno van Pottelsberghe, Free University of Brussels (Université Libre de Bruxelles), Belgium
prof. Markku Sotarauta, Tampere University, Finland

Panel of the School of Marketing and Communication

Chair prof. Ulf Andersson, Mälardalen University, Sweden
prof. Mika Pantzar, University of Helsinki, Finland
prof. Anu Sivunen, University of Jyväskylä, Finland

Panel of the School of Technology and Innovations

Chair prof. Heikki Mannila, Aalto University, Finland
prof. Anders Christiansen Erlandsson, Technical University of Denmark, Denmark
prof. Johan Frishammar, Luleå University of Technology, Sweden
prof. R Carter Hill, Louisiana State University, USA
prof. Kaushik Rajashekara, University of Houston, USA

Team for the evaluation of the research platforms

Chair prof. Heikki Mannila, Aalto University, Finland
prof. Anders Christiansen Erlandsson, Technical University of Denmark, Denmark
prof. Bruno van Pottelsberghe, Free University of Brussels (Université Libre de Bruxelles), Belgium

Appendix B: Timetable of the RAE

August 2021	The Vice-Rector for Research and the Evaluation Team give detailed information and instructions to the assessed research groups on the evaluation process.
November 2021–April 2022	The background information and the evaluation material are compiled by the Evaluation Team and sent to the units (re-search groups, schools, platforms).
April 2022	The Impact Case is submitted by the units.
April–June 2022	The candidates for panel members are identified.
May–June 2022	The self-evaluation reports are submitted by the units.
June 2022–August 2022	The panel members are contacted.
August 2022	The panel chairs, University Panel Chair and panel members are nominated and the dates for interviews of the panels are confirmed.
September 2022	The panel chairs and University Panel Chair have an orientation meeting with the Rector, Vice-Rector for Research and the Evaluation Team.
September 2022	The evaluation documents are shared to the panel chairs, University Panel Chair and panel members.
September 2022–October 2022	Panels' desk work with the evaluation material.
November 2022	Panels' interviews.
November 2022–December 2022	Panel chairs and University Panel Chair provides the evaluation reports to the Evaluation Team during the site visit or at the latest Dec 2, 2022. The university level report is finalised after receiving evaluation reports of all panels, by Dec 16, 2022.
December 2022–January 2023	University Panel Chair, The Vice-Rector for Research and the Evaluation Team compile the final RAE report.
January 2023	The final RAE report is published.

Appendix C: Types and sources of data in the RAE

Main domain and source	Data	Evaluated unit
Basic description	General information	RG, school, platform, Univaasa
Personnel		
University database	Number and career stage	RG, school, platform, Univaasa
	International	RG, school, platform, Univaasa
Budget		School, platform, Univaasa
Research projects and external funding		
University of Vaasa database	Amount of external funding	RG, school, platform, Univaasa
	Funding source	RG, school, platform, Univaasa
University of Vaasa database and self-report	International projects	RG, school, platform, Univaasa
	Joint projects within the Univaasa	RG, school, platform, Univaasa
	Joint projects with external partners	RG, school, platform, Univaasa
Self-evaluation reports	Self-evaluation report	RG, school, platform
	Impact Case report	RG, school, platform
Publications		
SoleCRIS database (University of Vaasa)	Publication lists	school
	Amount and type of publications	RG, school, platforms, Univaasa
	International publications	RG, school, platforms, Univaasa
	Joint publications with external partners (international, do-mestic, other high-ed institutions, other organisations, enterprises)	RG, school, platforms, Univaasa
	Open Access publications	RG, school, platforms, Univaasa
	Publication forum classification (0–3)	RG, school, platforms, Univaasa
Web of Science database	Bibliometric analysis of WoS database – CWTS (amount of publ & citations, mean citation score – field-normalised, publ in top10% cited journals, collaboration, Open Access publ)	RG, school, Univaasa
Scopus database	Bibliometric analysis of Scopus database – SciVal (amount of publ & citations, subject areas, publ in top 10%(1%) journals by SNIP, publ in top10%(1%) cited journals, field-weighted citation impact (FWCI), collaboration, Open Access publ)	RG, school, Univaasa
Scientific activities	Amounts	
SoleCRIS database (University of Vaasa)	Expert assignments in scientific publications and compilations, amount	RG, school, Univaasa
	Assignments in governing bodies/advisory boards of scientific organisations	RG, school, Univaasa
	Opponent or reviewer of a dissertation/licentiate thesis	RG, school, Univaasa
	Expert reports (authorities, professor positions, adjunct profes-sor (docent) nominations)	RG, school, Univaasa
	Expert assignments in scientific conference	RG, school, Univaasa
	International research visits (from and to the unit)	RG, school, Univaasa

Other background material		Evaluated unit
Results from AI analysis (HeadAI), research themes in publications	Evaluated unit's publication profile compared to their strategy and SDG9 (open access publications and jufo)	RG, school, Univaasa
Researcher Survey on research environment and services	Research services and infra (premises, info, applications, pro-jects, data, publishing)	RG, school, Univaasa
	Support for career development (info, training, collaboration, mobility, funding, projects)	RG, school, Univaasa
	Support for career development (info, training, collaboration, mobility, funding, projects)	RG, school, Univaasa

Appendix D: Societal impact evaluation criteria

Research groups and research platforms submitted an impact case for expert panellists’ review. In addition to a short summary, references and sources (e.g. reports, reviews, web links, statements, etc.) supporting the reported impact were requested.

The following guiding questions were presented to assess the impact cases in terms of their *reach* and *significance*:

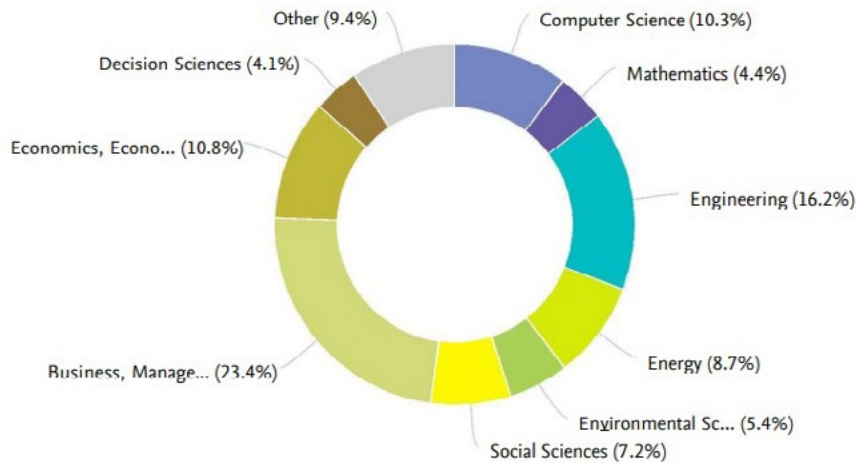
- Is the impact case research societally relevant, and what was the reach of the impact locally, regionally, nationally and/or internationally?
- To what extent does the impact case identify the beneficiaries and engage non-academic stakeholders (e.g. policymakers, general public, businesses, the environment, etc.) on a regional, national and/or global scale?
- To what extent does the impact case provide demonstrable evidence of stakeholder engagement and positive impacts being experienced by the beneficiaries of the research?

Each research group and platform also rated the societal impact of their case according to the following scale. Criteria of the three rates: 3 = excellent, 2 = good, 1 = developing are listed below.

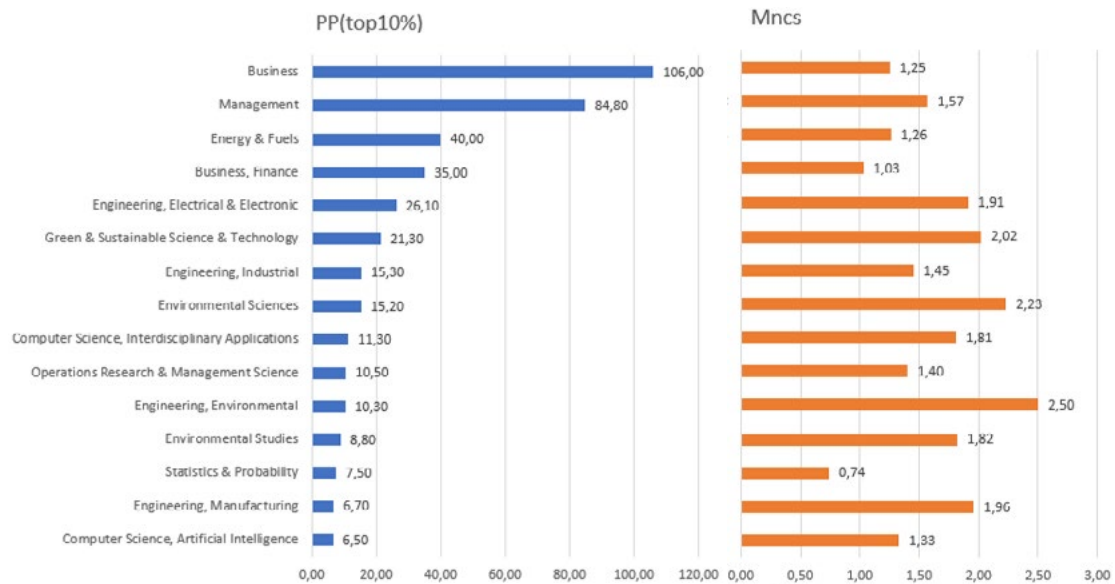
3 – Excellent	2 – Good	1 – Developing
<ul style="list-style-type: none"> • <i>Produces highly relevant and new knowledge and solutions for society</i> • <i>Clearly identified beneficiaries, stakeholders and outreach activities</i> • <i>Explicit links between research and claimed impact</i> • <i>Verifiable evidence of reach and significance</i> • <i>Clear and compelling description</i> 	<ul style="list-style-type: none"> • <i>Indicates relevant and new knowledge and solutions for society</i> • <i>Activities reach society</i> • <i>There is evidence of successful outcomes</i> • <i>Somewhat vague description of impact(s) and/or engagement of non-academic partners</i> 	<ul style="list-style-type: none"> • <i>Indicates weaker societal relevance of research, but has the potential for making a wider impact on society</i> • <i>Identification of audiences and/or engagement of non-academic partners is developing</i> • <i>Vague description of impact(s) and/or their relationship to the research</i> • <i>Lack of objective evidence</i>

Appendix E: Publications by subject area

Representation of subject areas (%) in the publications (total 1,507) at the University of Vaasa (2015–2020), based on the Scopus classifications (SciVal)



Indicators of the CWTS analysis of publications (WoS) by subject area



The top 10% most frequently cited publications

The average normalised number of citations of the publications



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