NVAO

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INITIAL ACCREDITATION

WO-BACHELOR
B ECONOMETRICS AND DATA SCIENCE
Vrije Universiteit Amsterdam

FULL REPORT
4 November 2023

Content

1 Peer review

The Accreditation Organisation of the Netherlands and Flanders (NVAO) determines the quality of a new programme on the basis of a peer review. This initial accreditation procedure is required when an institution wishes to award a recognised degree after the successful completion of a study programme.

The procedure for new programmes differs slightly from the approach to existing programmes that have already been accredited. Initial accreditation is in fact an ex-ante assessment of a programme. Once accredited the new programme becomes subject to the regular review process.

The quality of a new programme is assessed by means of peer review. A panel of independent peers including a student reviews the plans during a site visit to the institution. A discussion amongst peer experts forms the basis for the panel's final judgement and the advisory report. The agenda for the panel visit and the documents reviewed are available from the NVAO office upon request.

The outcome of this peer review is based on the standards described and published in the limited NVAO Assessment framework for the higher education accreditation system of the Netherlands (Stcrt. 2019, nr. 3198). Each standard is judged on a three-point scale: meets, does not meet or partially meets the standard. The panel will reach a conclusion about the quality of the programme, also on a three-point scale: positive, conditionally positive or negative.

An initial accreditation procedure usually does not involve the assessment of the achieved learning outcomes (Standard 4 of the limited assessment framework). The panel includes this standard in its assessment only if the NVAO considers that the programme already is offered and completed theses can be considered in the judgment of the panel. In this case, the programme has been offered as an English-taught track within the bachelor's programme Econometrics and Operations Research (EOR) since September 2017. At the moment of application, it was possible to assess the full programme including achieved learning outcomes. The programme could also provide sufficient theses from several years. The panel reviewed 16 final theses of the existing track and considered the achieved learning outcomes of the graduates. The panel also interviewed a delegation of current students of the programme.

NVAO takes an accreditation decision based on the full report. Following a positive NVAO decision with or without conditions the institution can proceed to offer the new programme.

This report contains the findings, analyses and judgements of the panel resulting from the peer review. It also details the commendations as well as recommendations for follow-up actions. A summary report with the main outcomes of the peer review is also available.

Both the full and summary reports of each peer review are published on NVAO's website www.nvao.net. More information on NVAO and peer reviews of new programmes can also be found there.

2 New programme

2.1 General data

Institution	Vrije Universiteit Amsterdam
Programme	academic bachelor Econometrics and Data Science
Variant	Fulltime
Degree	Bachelor of Science
Location	Amsterdam
Study load	180 ECTS credits[1]
Field of study	Economie (Economics)

2.2 Profile

The academic bachelor's programme Econometrics and Data Science (EDS) prepares students for a career in quantitative fields related to, for instance, economics and finance, by educating data scientists who understand the underlying mathematics and statistics. Graduates are able to apply data science methods and create an awareness and understanding of what these methods can and cannot do. The programme combines theory from several disciplines with practical skills, teaching students how to implement methods.

Since September 2017, the programme has been offered as an English-taught track (with some tutorials also taught in Dutch) within the bachelor's programme Econometrics and Operations Research (EOR). It intends to serve the growing need for data science specialists. By becoming an independent programme, EDS will be able to provide clarity and transparency about its profile and extend its target group. The programme is the responsibility of the School of Business and Economics (SBE), which offers a wide range of studies in economics and business administration. Part of the EDS curriculum is provided by the Faculty of Science.

2.3 Panel

Peer experts

- Prof. dr. Jan Boone (chair), professor and head of the department Economics, Tilburg University;
- Prof. dr. Filip Van den Bossche, vice dean for education and students at the Faculty of Economics and Business (FEB), KU Leuven;
- Dr. Patty Duijm, economist at Data Science Hub, De Nederlandsche Bank;
- Sven Goessens BSc (student), master student Data Science & Society, Tilburg University.

Assisting staff

Anne Martens MA (secretary)
Frank Wamelink (NVAO policy advisor and process coordinator)

Site visit

Amsterdam, 19 September 2023

[1] European Credit Transfer and Accumulation System

3 Outcome

The NVAO approved panel reaches a positive conclusion regarding the quality of the bachelor's programme Econometrics and Data Science (EDS) offered by Vrije Universiteit Amsterdam. Since September 2017, the programme has been offered as an English-taught track within the bachelor's programme Econometrics and Operations Research (EOR) and the institution now intends to offer this programme of 180 ECTS credits independently in a fulltime variant in Amsterdam. The programme complies with the four standards of the limited NVAO assessment framework.

The programme prepares students for a career in quantitative fields related to, for instance, economics and finance. The combination of econometrics and data science gives the programme a distinctive profile that reflects current developments in academia and addresses the great need for data scientists who understand the underlying mathematics and statistics. External stakeholders are involved in the development of the programme to ensure it stays up to date with recent developments in the industry.

The first two years of the programme offer a broad and thorough foundation in mathematics, statistics, data handling and programming. Students are also given an introduction to ethics, economics and finance. Students work on individual and group assignments to apply what they have learnt, using real data sets. In general, the panel considers the content of the courses to be appropriate, although some data science aspects could be given more attention. The panel was pleased with the programme's plans in this regard. The final year offers students the opportunity to select courses based on their personal interests. Students finish the programme with a thesis.

The course assessments are in line with the intended learning outcomes and enable students to develop and show their knowledge and skills in different ways. The panel studied a selection of exams and theses and established that they fit the programme and demonstrate a bachelor's level. The panel noticed that most theses are related to classical econometric topics and models rather than data science, but expects that it will be easier to motivate students to opt for data science components and models once the EDS track has become an independent programme with a clearer profile.

The panel is positive about the programme's qualified and dedicated staff members. They represent the different disciplines related to data science and have a broad network of (inter)national contacts in the field of econometrics research. Some lecturers also have positions in the professional field. An experienced Examination Board safeguards the quality of assessment procedures in a professional manner.

The panel concludes that EDS offers a relevant and attractive programme that meets the developments in the data science discipline and professional field. The curriculum aligns with the academic bachelor's level and enables students to develop themselves as data scientists who can analyse and tackle problems that involve working with data.

Given the international field of data science and job opportunities for graduated students, the panel agrees that EDS should (continue to) be taught in English.

Standard	**Judgement**
1. Intended learning outcomes	meets the standard
2. Teaching-learning environment	meets the standard
3. Student assessment	meets the standard
4. Achieved learning outcomes	meets the standard
Conclusion	*positive*

4 Commendations

The programme is commended for the following features of good practice.

1. Advisory Board – The programme actively involves external stakeholders in the development of the programme to keep track of developments.

2. Curriculum – The programme has a balanced and multidisciplinary curriculum with a foundation in mathematics, statistics, data handling and programming. Interested students can further develop their skills in ethics, economics and finance.

3. Assignments – Students work on integrative practical assignments that use real data sets and require students to apply what they have learnt.

4. Staff – The academic staff members are qualified and dedicated to the programme. They represent the different disciplines related to data science and have a broad network of (inter)national contacts in the field of econometrics research. Some lecturers also hold positions in the professional field.

5. Examination Board – An experienced Examination Board safeguards the quality of assessments in a professional manner.

5 Recommendations

To further improve the programme, the panel recommends a number of follow-up actions.

1. Ethics – Make the compulsory course on ethics more geared towards data science practice, for instance by discussing real-world cases related to privacy and legal issues.

2. Links to practice – Investigate whether it is possible to incorporate guest lectures and real-life cases earlier in the curriculum, so students get an early view of what data science and the job of a data scientist entail in practice.

3. Active blended learning – Further implement the policy on active blended learning by sharing good practices and using the expertise of the recently launched VU's Centre for Teaching and Learning, which has a taskforce active blended learning.

4. Thesis assessment – Adjust the assessment criteria matrix to the specific profile of the new programme, to provide guidelines to examiners on how to come to a certain score when assessing the bachelor's theses.

5. Programming – Extend the programming pathway to ensure that students develop their skills throughout the entire first year. Explain the setup of this pathway more clearly to students, so they understand the added value of learning three different programming languages.

6 Assessment

6.1 Standard 1: Intended learning outcomes

The intended learning outcomes tie in with the level and orientation of the programme; they are geared to the expectations of the professional field, the discipline, and international requirements.

Judgement
Meets the standard.

Findings, analysis and considerations
The bachelor's programme Econometrics and Data Science (EDS), offered by Vrije Universiteit Amsterdam (VU), prepares students for a career in quantitative fields related to, for instance, economics and finance. It is a theory-based and data-driven programme that teaches students to critically assess the strengths and weaknesses of existing econometrics and data science methods and to possibly adapt and extend them. Graduates are able to use mathematical, probabilistic and statistical as well as computer science tools to analyse and tackle problems that involve working with data. They use relationships found in data to make forecasts and to facilitate decision-making. According to the panel, the combination of econometrics and data science gives the programme a distinctive profile that reflects current developments in academia and addresses the great need for data scientists who understand the underlying mathematics and statistics.

Data science is a multidisciplinary field, with roots in mathematics, statistics and computer science. Students learn and experience how different disciplines need to be combined to solve today's problems. The programme is built around four core elements: (1) database management, (2) algorithms, (3) distributed computing, and (4) statistics and machine learning – with a focus on statistical methods suitable for economic and financial data. The self-evaluation report contained an overview of related programmes at VU and other (inter)national universities. During the site visit, the programme management further clarified how the new programme differs from existing bachelor's programmes at VU.

The programme has been developed by the School of Business and Economics (SBE). Its intended learning outcomes have been derived from the five main SBE Bachelor Learning Goals[2] and are formulated as seven learning objectives. These specify what graduates of the programme *can do* and are related to the following topics: (1) academic and research skills, (2) bridging theory and practice (knowledge), (3) bridging theory and practice (application), (4) social skills (communication), (5) social skills (teamwork), (6) broadening your horizon, and (7) self-awareness. In the self-evaluation report, the learning outcomes are linked to the Dublin descriptors. The panel confirms that the learning objectives comprise relevant knowledge and skills, and that they are formulated in a clear way and at bachelor's level.

Since September 2017, the programme has been offered as an English-taught track within the bachelor's programme Econometrics and Operations Research (EOR). The application document presents several arguments to start as an independent programme. The EDS track contains many topics that differ from the more traditional EOR programme. Being a track of the EOR programme does not bring the same clarity and transparency to the outside world as an independent programme would do. This was also discussed during the recent midterm

[2] This approach follows the format of the Association to Advance Collegiate Schools of Business (AACSB), an international organisation that provides accreditation for business education.

review of the EOR programme. As an independent programme, EDS will be able to sharpen its profile and extend its target group both nationally and internationally. The panel supports SBE's intention to create an independent bachelor's programme EDS, because it will provide more opportunities to define the programme's unique profile and to increase the visibility of the programme. It will also allow the programme to better integrate current developments in the rapidly changing field of data science and artificial intelligence (AI) research and practice into the curriculum. Although EDS is now further developed as an independent programme with its own emphasis, there remains overlap between the programmes EDS and EOR.

The panel established that the programme aligns with the university's aims and with the faculty's mission 'Science with Purpose'. The aims are related to three core behavioural values (responsible, personal and open) and three roles linked to content components (academic, professional and citizen). The programme intends to train students in academic skills, theoretical knowledge and critical reasoning, while developing skills that help them grow in their future role as professionals. Reflections on ethical topics make students aware they are part of society.

The two bachelor's programmes EOR and EDS share an Advisory Board together with the master's programme EOR. This board regularly advises the programme management on the expectations and requirements of the labour market. It consists of alumni and representatives of the professional field and has recently been recomposed. In addition, SBE discussed the draft curriculum of the new programme with data science companies. The panel is positive about this cooperation with external stakeholders and considers it vital to keep track of developments.

The panel supports SBE's intention to offer the EDS programme as an independent bachelor's programme with a distinctive profile. It concludes that the intended learning outcomes ('learning objectives') are in line with wat is to be expected of a bachelor's programme in Econometrics and Data Science. The objectives comprise knowledge and skills that are relevant to the field of data science, and they are formulated clearly. The panel appreciates the involvement of external stakeholders in the development of the programme. All in all, the panel concludes that the programme meets standard 1.

6.2 Standard 2: Teaching-learning environment

The curriculum, the teaching-learning environment and the quality of the teaching staff enable the incoming students to achieve the intended learning outcomes.

Judgement
Meets the standard.

Findings, analysis and considerations
The programme has adequately translated the learning objectives to a coherent curriculum. Course descriptions and course manuals provide details about the contents and structure of the courses on offer. The panel observed a great consistency between the overall learning objectives and the learning goals at course level. The programme combines theoretical knowledge and practical skills to solve real-world problems, thus simultaneously developing students' general academic skills and their knowledge and skills in data science. The panel appreciates the balanced and multidisciplinary nature of the programme, which gives students the opportunity to discover their personal interests and ambitions.

The first two years of the programme offer a broad basis by means of compulsory courses in mathematics, statistics, data handling and programming. Students are also given an introduction to ethics, economics and finance. The panel agrees with students and the professional field that this foundation is an asset of the programme. The mathematical focus is strengthened by the cooperation with VU's Faculty of Science, which offers the mathematics and programming courses. Some of the courses in the first two years are shared with the EOR bachelor's programme. The panel considers the content of the courses to be appropriate, although some data science aspects (e.g., API management and Git version control) could be given more attention. The panel is generally positive about the programme's plans in this regard, but stresses that the compulsory course on ethics should also become more geared towards data science practice, for instance by discussing real-world cases related to privacy and legal issues. The panel recommends discussing this with the lecturers of the course.

Students start the learning pathway on programming with a course on programming in Java. Although some students doubt the relevance of this language for data science, alumni appreciate the thorough knowledge of the fundamentals of programming acquired by mastering Java. Later on in the first year, the open source languages R and Python are introduced. Students told the panel that there is a gap in the learning pathway on programming because they do not program in the first part of the second semester. The panel agrees with students that it would be worthwhile to extend the learning pathway on programming throughout the first year, to ensure that students keep developing their programming skills. The panel also recommends to explain the setup of this pathway more clearly to students, so they understand the added value of learning three different programming languages.

The third year gives students more freedom to select courses based on their personal interests. In the first semester, they choose a minor within or outside SBE, study a semester abroad or do an internship. VU's Career Services and the study association Kraket support students in finding a suitable position. The panel studied the internship guidelines and established that they provide relevant information. The panel is also positive about SBE's plans regarding an internship body, because additional support may motivate more students to pursue an internship. The final semester consists of in-depth courses and a bachelor's thesis.

The panel noted that students have limited exposure to the professional field. A small number of students actually arranges an internship and it seems that contacts with data science practice are mainly organised by the study association Kraket. During the site visit, the panel discussed this in multiple sessions, and learnt that guest lectures are only part of the elective courses in the third year of the programme. The panel recommends investigating whether it is possible to incorporate guest lectures and real-life cases earlier in the curriculum, and, if so, developing a plan to organise this, so students get an early view of what data science and the job of a data scientist entail in practice.

The programme offers limited flexibility for personal learning trajectories in the first two years, but most students do not seem to mind this. As said, they value the thorough (and demanding) foundation in mathematics and programming. Nevertheless, the panel thinks it may be valuable for some students to broaden their study path and follow additional courses at other faculties, such as computer science or mathematics. This would prepare them for more technical positions in the job market. Given the new profile of the programme, such study pathways will likely become more usual. Few students have pursued such a trajectory in the past, and indicated that it is not always easy to make arrangements because of the involvement of multiple faculties. The panel advises the programme to make arrangements with other VU faculties to proactively provide information to students about a broadened personal trajectories that cross faculty borders.

In line with VU's and SBE's educational vision, the programme uses active learning in the classroom. This is applied through lectures, (computer) tutorials, projects and the thesis. The number of contact hours is high in the first year, to support students in developing their mathematical and quantitative skills. The panel deems this appropriate. Students work on individual assignments to stimulate reflection and the further embedding of core concepts. The first four semesters all end in a four-week period when students work on a group project to apply what they have learnt in the previous courses. Students told the panel that they are enthusiastic about these assignments that let them work with real data sets. The panel also believes that the integrative practical assignments have a positive contribution to student motivation and increase their commitment to the programme.

During the covid-19 pandemic, VU Amsterdam reorganised its traditional methods of teaching and redeveloped many aspects of its educational concept. This resulted in the use of digital tools such as online quizzes and so-called knowledge clips. SBE's ambition is to combine on-campus teaching with technological opportunities, where technology is used to enhance teaching effectiveness while on-campus education remains the point of departure. The panel appreciates SBE's vision regarding 'active blended learning', but noticed that its use and development depend on pilots and initiatives of individual teachers. As a result, active blended learning is not applied in the same way throughout the programme. The panel recommends to further implement the policy on active blended learning by sharing good practices and using the expertise of the recently launched VU's Centre for Teaching and Learning, which has a taskforce active blended learning.

Students are supported in several ways. SBE recently introduced a new mentoring programme, the Student Academic Mentor (SAM), which consists of a combination of mentoring by students and tutoring by lecturers. The focus of this programme is on the first year. In later years, tutoring is less structured, but students mentioned that staff members are easily approachable and that the active study association Kraket plays a vital role in the student community. Students may also consult the general facilities for student support, career counselling, wellbeing, as well as tutoring in English and mathematics.

The panel is positive about the programme's qualified and dedicated staff members. They represent the different disciplines related to data science and have a broad network of (inter)national contacts in the field of econometrics research. Some lecturers also have positions in the professional field. During the site visit, the panel spoke with lecturers about the incorporation of societal challenges in the curriculum and was pleased with the examples given. The panel has the impression that lecturers have a high degree of autonomy in designing and delivering courses and that they fulfil these tasks adequately. Lecturers are satisfied with the support they receive in terms of didactical training. A programme director is formally responsible for content, organisation and quality assurance, as well as day-to-day operations in the programme. The programme director is assisted by two programme coordinators.

So far, the EDS track has attracted a limited number of students, leading to a favourable staff/student ratio and close contact between students and lecturers. SBE expects to attract a larger number of students, coming from more diverse backgrounds, once the programme is independent. The panel advises to clarify the characteristics of the expected student population and advises to monitor lecturers' workload closely, especially when student numbers rise. It trusts SBE will be able to keep up with probable growth given its past record in instant recruitment and financing of new staff members during the rapid increase in student numbers during the past decade.

The programme is fully taught in English and attracts a mix of Dutch and international students. The panel is of the opinion that the name 'Econometrics and Data Science' fits the contents of the programme and acknowledges the need to deliver the programme in English. This prepares students for the (international) labour market and subsequent master's programmes, where English is the leading language of communication.
Offering the programme in English will attract an international and diverse student body that enables students to learn to operate in an international context, in line with VU's concept 'Mixed Classroom'. The panel appreciates that tutorials in the first year are also offered in Dutch to students who may not be fully comfortable yet in English; the SBE board informed the panel that this approach will also be implemented in the second year. The programme also collaborates with the Faculty of Humanities in courses on (English) writing and oral skills. Lecturers are proficient in English and VU offers Dutch language courses to international staff members and students.

The panel concludes that the programme has translated the learning objectives to learning goals at course level. Together, they form the basis of a relevant and coherent curriculum with a clear mathematical foundation. The programme builds a strong foundation and gradually dives deeper into the use of data science methods. The academic staff members are well-qualified, dedicated and represent the different disciplines related to data science. Lecturers indicate that they receive adequate support. The programme has sufficiently justified why the programme is taught in English and bears a foreign language name. In summary, the panel is of the opinion that the programme meets the requirements for the teaching-learning environment. To further develop the programme, the panel made recommendations regarding the integration of data science practice in the course on ethics and the curriculum in general, as well as regarding the implementation of the policy regarding active blended learning.

6.3 Standard 3: Student assessment

The programme has an adequate system of student assessment in place.

Judgement
Meets the standard.

Findings, analysis and considerations
The programme has developed an assessment plan that is in line with SBE's assessment policy and procedures. This document describes the vision behind and way of assessment, clarifies how the programme ensures that students attain the learning objectives, and gives insight into the faculty's quality assurance and improvement of assessment. The panel is of the opinion that the programme has adequate assessment procedures in place.

Students are informed about the assessment rules and modes via the course manuals. The assessment plan gives an overview of the assessment types used throughout the curriculum. The programme uses a variety of assessment types (e.g., exams, cases, papers and presentations), giving students the opportunity to develop and show their knowledge and skills in different ways. The panel noted that many courses in the second and third year involve group assignments. Although the group assignments are always combined with an exam, presentation or individual assignment, the panel notes that group projects carry the risk of free riding. The panel suggests that tools such as GitHub Classroom may make each student's individual contribution to programming assignments more visible.

The panel appreciates the involvement of multiple staff members in the development of assessments: the course coordinators are responsible but work in close coordination with co-

readers and the programme management. During the site visit, the panel studied a selection of exams and established that they fit the programme.

In the last semester, students work on a thesis, which is an individual critical literature study about a sub-topic in econometrics and data science. A thesis manual explains the rules and procedures related to the thesis procedures in a transparent way.
All theses are assessed by the thesis supervisors and a second reader, who use a standard scoring sheet with support of the assessment criteria matrix before discussing their grading in an attempt to reach consensus about the final grade. The panel heard that SBE is developing a thesis registration system that makes the assessment procedure more transparent and supports timely feedback. As of the academic year 2023-2024, an oral component will be part of the bachelor thesis EDS. The panel is in favour of this addition, because it offers an additional opportunity to develop and assess students' presentation skills. It is also a means to establish the authenticity of student work, making a student's research process more visible, and offers a safeguard against the misuse of generative AI tools such as ChatGPT.

The panel noted that the thesis assessment form leaves some room for discussion about the exact grade given. The panel recommends describing more clearly how the examiners are to come to a certain score by adjusting the assessment criteria matrix to the specific profile of the new programme. This will also make the procedure more transparent to students. The panel was pleased to hear that the Examination Board has recently investigated the thesis process and formulated a list of improvements that have been picked up by the programme.

The SBE Examination Board supervises the examination process and bears the final responsibility for safeguarding the quality control of examinations and assessment. It appoints examiners and investigates systematically whether assessment processes have been carried out according to predefined criteria. The Examination Board is supported by several committees that deal with the screening of assessments and fraud. The panel is positive about the Examination Board's expertise and professional organisation.

SBE has developed a practical policy regarding the use of generative AI in education: lecturers specify in the course manuals to what extent students may use tools such as ChatGPT, as long as they don't present it as their own work. Lecturers indicated that exams have become more important in many courses, and it is no longer possible to compensate an insufficient mark on an exam with a good grade on an assignment. The panel supports this approach.

The panel concludes that the programme has an adequate system of student assessment in place, based on SBE's assessment policy and procedures. The course assessments are in line with the learning objectives and enable students to develop and show their knowledge and skills in different ways. Multiple staff members are involved in the design of assessments and students receive sufficient information about the assessment procedures. The experienced SBE Examination Board safeguards the quality of assessment procedures. The panel judges that the programme meets standard 3 and underlines the recommendations of the Examination Board regarding the thesis assessment procedure.

6.4 Standard 4: Achieved learning outcomes

The programme demonstrates that the intended learning outcomes are achieved.

Judgement
Meets the standard.

Findings, analysis and considerations
In order to assess the achieved learning outcomes, the panel reviewed several assignments, exams and a selection of 16 theses, written in recent years by students in the EDS track. The selection of theses was drawn from a list of all graduates in the academic years 2020-2021, 2021-2022 and 2022-2023 (a total of 53 theses). The selected theses are from the two most recent academic years. They show an even distribution over higher and moderate final grades, as well as over subjects and thesis supervisors.

The panel members reviewed the selection of theses in preparation to the site visit and mutually reported and exchanged their findings. Overall, the panel was satisfied with the level of the students' work and concluded that they are in line with the intended learning outcomes. The theses reflected a decent analysis and the assessment of theses demonstrated sufficient consistency and the grades given were comprehensible.

The panel noticed that most theses are related to classical econometric topics and models rather than data science. The panel expects that it will be easier to motivate students to opt for data science subjects once the EDS track has become an independent programme with a clearer profile. The programme could encourage this by offering more topics that are relevant to the field. In addition, the panel considered the theses to be rather technical and not very accessible to non-experts. The panel advises to add 'communication with non-experts' as one of the thesis goals and supports the programme's intention to add an oral component to the thesis. This will provide an additional opportunity to assess whether students have achieved the intended learning outcomes related to communication skills.

The panel received information about the further careers of graduates and learnt that the vast majority of students opt for a master's programme, with the master's programme Econometrics and Operational Research being the most popular option. Initially, the panel was surprised about this choice, but during the site visit the panel understood that this programme has a track on data science.

The SBE Career Office facilitates contact between faculty and alumni and intends to keep alumni connected to the SBE programmes by means of an alumni day, a podcast and an alumni magazine. It actively approaches alumni as advisors who keep the programme up-to-date on societal and technological developments. In addition, alumni may stay in touch with each other, students and lecturers through the alumni association 'Extrie'. Nevertheless, the programme indicates that it is difficult to keep close contact with alumni and the panel supports the plans to develop a new faculty-wide alumni policy.

The panel established that the programme demonstrates that the intended learning outcomes are achieved. Student assignments and theses demonstrate a level that is appropriate for an academic bachelor's programme. The panel expects that the topics of future theses will be more geared towards data science and it supports the programme's intention to add an oral defence to the thesis. Alumni and the professional field are satisfied with the programme and graduates continue their academic careers in relevant master's programmes. The panel therefore concludes that the programme meets this standard.

6.5 Degree and field of study

The panel advises awarding the following degree to the new programme: Bachelor of Science. The panel supports the programme's preference for the following field of study: Economie (Economics).

Abbreviations

AI	Artificial Intelligence
API	Application Programming Interface
ECTS	European Credit Transfer and Accumulation System
EDS	Econometrics and Data Science
EOR	Econometrics and Operations Research
NVAO	Accreditation Organisation of the Netherlands and Flanders ('Nederlands-Vlaamse Accreditatieorganisatie')
SBE	School of Business and Economics
VU	Vrije Universiteit Amsterdam

The full report was written at the request of NVAO and is the outcome of the peer review of the new bachelor's programme Econometrics and Data Science offered by Vrije Universiteit Amsterdam

Application no.: AV-1762

NVAO

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