

Assessment report  
Limited Programme Assessment

**Master Econometrics and Management Science**

Erasmus University Rotterdam

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## 1. Executive summary

In this executive summary, the panel presents the main considerations which have led to the assessment of the quality of the programme Master Econometrics and Management Science of Erasmus University Rotterdam, which has been assessed according to the NVAO Assessment Framework.

The panel observes programme management has taken a wide range of measures in response to the recommendations made in the previous external assessment in 2009 and in the internal evaluation in 2012. Programme management has, among others, revised the programme intended learning outcomes, installed an Advisory Board and redesigned the Examination Board responsibilities.

The panel approves of the objectives of the programme, to educate students in one of the sub-domains of the econometrics discipline, to teach them thoroughly academic research knowledge and skills and to train them to acquire professional skills. The panel is especially positive about the strong research orientation of the programme. The panel supports the intentions of programme management to prepare students for positions in the labour market and welcomes the specialisations which are offered in the programme.

The panel studied the intended learning outcomes of the programme and observes these to meet the programme objectives, exhibiting in-depth and systematic knowledge and understanding of the specialisation students have chosen, thorough academic research competencies, and a range of professional skills. In the panel's view, the learning outcomes are consistent with the domain-specific reference framework, which was drafted by Erasmus School of Economics and the economics programmes of Vrije Universiteit Amsterdam and of Wageningen University. In addition, the learning outcomes correspond to the master level requirements of the programme.

The panel feels the involvement of the professional field through the Advisory Boards of the specialisations within the programme is satisfactory and is helpful in aligning the programme with the professional field requirements.

The admission requirements and processes are well designed and strict, allowing only students in, who may be regarded to have the capacities to complete the programme. The panel is positive about the pre-master programme for students with deficiencies.

The curriculum reflects all of the intended learning outcomes of the programme adequately and evenly. The panel considers the curriculum to be very well designed and effective in teaching students in-depth the theory of the specialisation they have chosen and the quantitative skills needed to model and address problems in the field of their specialisation. In addition, students are offered ample opportunities to address real-life problems. The students with whom the panel met, expressed to be very positive about the curriculum contents and about the relation to the professional practice.

The panel approves of the educational principles and the study methods of the programme, as they foster the students achieving the intended learning outcomes. Students and lecturers expressed being positive about the small-scale dimension of the programme. The panel welcomes the steps Erasmus School of Economics takes to ensure small-scale teaching, even in relatively large-scale specialisations.

Programme management has taken measures to raise the student success rates. The panel regards the student success rates to be appropriate and encourages programme management to try and raise these further. The panel recommends to improve the information provided to the students. The School uses various platforms (Blackboard, Sin-online, Osiris), which is not very transparent for students.

The panel is very positive about the lecturers' research track records. The panel also approves of their educational capabilities, as may be deduced from the proportion of lecturers holding the BKO-certificate.

The panel approves of the examination and assessment policies and rules and regulations of the Erasmus School of Economics, in force for this and the other programmes of the School. They ensure the validity of the examinations, the reliability of the assessments, the competencies and expertise of examiners and the transparency of the examination processes. The Examination Board works along the lines as intended by Dutch applicable law. The Board monitors the examination and assessment processes, analyses the examinations and regularly inspects the theses.

The panel considers the examination methods to be adequate. The diversity of examination methods in courses and across courses allows for the assessment of both knowledge and skills, relevant to the programme.

The thesis process is satisfactorily organised, especially since the *Thesis Workflow System* has been implemented. The panel recommends, however, to inform students more clearly and more comprehensively about the thesis process and the thesis assessment. The assessment of the theses is a reliable process, as two examiners are involved and sound assessment forms with relevant assessment criteria are used. The panel recommends considering to use weighted criteria in the thesis assessment.

The panel regards the examinations of the courses to be challenging and to definitely meet the courses' learning goals. Students will have achieved most of the programme intended learning outcomes, if they have passed all of these examinations.

The average grade of the theses in 2014 – 2015 is 7.8. The panel studied six theses of students in the programme. These theses are assessed by the panel to be at least satisfactory and some of them to be very good. Generally, the panel would have given somewhat higher grades than the programme examiners.

Graduates have very good career perspectives and tend to find suitable and well-paid positions relatively shortly after their graduation.

The panel assesses the programme Master Econometrics and Management Science of Erasmus University Rotterdam to be good and recommends NVAO to grant re-accreditation to this programme.

Rotterdam, 6 March 2017

Panel chair  
Prof. dr. T.J. Wansbeek

Secretary  
drs. W. Vercouteren RC

## 2. Assessment process

Certiked VBI received a request to conduct a limited programme assessment for the re-accreditation of the academic degree programme Master Econometrics and Management Science. This request was submitted by Erasmus University Rotterdam.

Certiked requested the approval by NVAO of the proposed panel of experts to conduct this assessment. NVAO have given their approval. The panel composition was as follows (for more detailed information please refer to Annex 4: Assessment panel composition):

- Prof. dr. T.J. Wansbeek, Emeritus Professor of Statistics and Econometrics, University of Groningen (panel chair);
- Prof. dr. J. Hartog, Emeritus Professor of Microeconomics with visiting scholar position, University of Amsterdam (panel member);
- Prof. dr. R. Kabir, Professor and Chair of Corporate Finance and Risk Management, University of Twente (panel member);
- S.M. van den Hoek, student Bachelor programme Tax Economics, University of Amsterdam (student member).

On behalf of Certiked, drs. W. Vercouteren RC was responsible for the process coordination and for drafting the panel's report. All panel members and the secretary signed a statement of independence and confidentiality.

The panel conducted this assessment on the basis of the NVAO Assessment Framework of 19 December 2014 (Staatscourant nr. 36791). Regarding the selection of the theses, the panel proceeded in line with the NVAO Guidelines for the assessment of final projects during external assessments of 18 February 2015. On 19 September 2016, NVAO determined the number of theses to be studied by the panel in this case.

The following procedure was adopted. The panel members of the panel studied the documents presented beforehand by programme management, including a number of theses (please refer to Annex 2 and 3: Documents reviewed and Theses reviewed).

Before the date of the site visit, the panel chair and the panel secretary met to discuss the assessment procedures. On 30 November 2016, the panel had a meeting to discuss the preliminary findings concerning the quality of the programme. Beforehand, the panel members had sent in a number of questions to be put to the programme representatives during the site visit.

During the meeting on 30 November 2016, the findings of the panel members, including those concerning the theses, were discussed. On the basis of the input of the panel, the secretary summarised the questions, which served as a starting point for the discussions with the programme representatives during the site visit.

On 1 December 2016 and on 2 December 2016, the panel conducted the site visit on the Erasmus University Rotterdam campus. The site visit was conducted in accordance with the schedule drawn up beforehand (please refer to Annex 1: Site visit schedule). Prior to the site visit, programme management communicated the open office hours to the students in the programme and the staff. No one called on the panel.

A draft version of this report was finalised by the secretary, having taken into account the information presented as well as the findings and considerations of the panel. The panel members studied the draft report and made a number of changes. Thereupon, the secretary drew up the final report. This report was presented to programme management to be corrected for factual inaccuracies. After having been corrected for these factual inaccuracies, the report was sent to the institution's Board to accompany their request for re-accreditation.

### 3. Overview of the programme

#### 3.1 Basic information about the programme

*Administrative information about the programme:*

Name programme in CROHO: Master Econometrics and Management Science  
 Orientation, level programme: Academic Master  
 Grade: MSc  
 Number of credits: 60.0 EC  
 Specialisations: Business Analytics and Quantitative Marketing  
 Econometrics  
 Operations Research and Quantitative Logistics  
 Quantitative Finance  
 Location: Rotterdam  
 Mode of study: Full-time (English-taught programme)  
 Registration in CROHO: 60079

*Administrative information about the institution:*

Name of institution: Erasmus University Rotterdam  
 Status of institution: Government-funded university  
 Institution's quality assurance: Approved

*Quantitative data about the programme*

Percentage of students who completed the programme in two years (n+1)

Cohort	2011	2012	2013
Percentage of students	62 %	65 %	62 %

Lecturers' qualifications

Qualification	MSc	PhD	BKO*
Percentage of lecturers	100 %	92 %	71 %

\*BKO means having obtained Dutch University Teaching Qualification. In the figure exemptions are included. Of the lecturers, additional 8 % are in the process of obtaining the BKO-certificate.

The student-to-staff ratio is 22 : 1 (study year 2015 – 2016)

Contact hours are 7 hours per week.

### **3.2 Main facts about the institution**

The degree programme Master Econometrics and Management Science is a programme of Erasmus School of Economics of Erasmus University Rotterdam.

In its own words, Erasmus University Rotterdam is a research University, with a pronounced social orientation in its education and research. Academics and students at the university are expected to endeavour to solve global social challenges, drawing inspiration from the metropolis Rotterdam. The university spearheads in education and research are health (from molecule to human to society and back), wealth (sustainable economic growth), governance (the organization of companies and society) and culture (happiness and identity in the modern urban society). According to its strategic plan for 2014 – 2018, Erasmus University Rotterdam has set as a goal to strengthen the international impact and relevance of its education and research. The University works together closely with Delft University of Technology and Leiden University.

Erasmus University Rotterdam employs more than 2,700 staff, lecturers as well as support staff. Over 26,000 students study at this University, being composed of more than 16,000 bachelor students and more than 10,000 master students.

Erasmus University Rotterdam is composed of seven faculties, these being Erasmus School of Economics, Erasmus School of Law, Faculty of Social Sciences, Erasmus Medical Centre, Faculty of Philosophy, Erasmus School of History, Culture and Communication and Rotterdam School of Management. In addition, the university includes the Institute of Health Policy & Management, the International Institute of Social Studies and the Institute for Housing and Urban Development Studies.

On the website, Erasmus School of Economics expresses to be an internationally renowned institute that contributes scientific knowledge to future economic issues and aims to answer currently relevant issues of concern to government and firms. The School's focus is on the creation, the dissemination and the application of scientific knowledge, all from an economic perspective.

Erasmus School of Economics' portfolio of programmes includes three bachelor programmes, four master programmes, two research master programmes and four postgraduate programmes. The School employs nearly 500 staff, whereas about 4,500 students study at the School.

### 3.3 Intended learning outcomes

The intended learning outcomes of the programme are as follows.

- Students possess in-depth and systematic knowledge of an area within econometrics and management science.
- Students analyse and systematically explain complex phenomena and research questions in the economics of government and business by using their knowledge of economic theories and methodology of econometrics and management science and, in doing so, are critical and creative.
- Students formulate research questions based on scientific concepts and theories.
- Students select a research set-up appropriate to the research question.
- Students select or create one or more suitable methods for data collection and processing.
- Students formulate clear conclusions and recommendations based on research and, in doing so, behave as creative professionals.
- Students use different interpretation frameworks in making statements about reality.
- Students evaluate their ideas for internal consistency, empirical validity and strength and make adaptations if necessary.
- Students communicate effectively and at a high level, both in writing and verbally, with people and groups of a diverse nature.
- Students demonstrate self-direction and originality in dealing with and resolving problems in the field of study.

### 3.4 Outline of the curriculum

In the table below, the programme curriculum is presented.

Courses	Credits
Core course	4.0 EC
Seminar	12.0 EC
Master Thesis Proposal	4.0 EC
Thesis	16.0 EC
Total credits of the programme	60.0 EC

#### 4. Overview of assessments

Standard	Assessment
Standard 1. Intended learning outcomes	Satisfactory
Standard 2: Teaching-learning environment	Good
Standard 3: Assessment	Satisfactory
Standard 4: Achieved learning outcomes	Good
Programme	Good

## 5. Findings, considerations and assessments per standard

### 5.1 Standard 1: Intended learning outcomes

*The intended learning outcomes of the programme have been concretised with regard to contents, level and orientation; they meet international requirements.*

#### *Findings*

In preparation of this external assessment, the Erasmus School of Economics in collaboration with the management of the economics programmes of Vrije Universiteit Amsterdam and Wageningen University updated the domain-specific reference framework for economics. The current reference framework is an update on a number of non-essential points of the 2009 edition, which was approved by the Deans of all Economics Faculties in the Netherlands. The major change has been the removal of sections referring to business administration.

Programme management informed the panel that, whereas the main goal of the bachelor programmes of Erasmus School of Economics is to educate students in the fundamentals of the economics or the econometrics domain, the master programmes of the School are meant to give students the opportunities to specialise in one of the sub-domains of economics or econometrics. In the master programmes, students are prepared for positions in the labour market, which require the knowledge and skills of the specialisation.

The objectives of the programme are to provide students with specialised knowledge and understanding within the domain of econometrics, to educate them thoroughly in academic research competencies and to train them in professional skills. More specifically, students are educated in economic theory and in quantitative skills, are taught to develop models to study economic phenomena and are trained to apply econometrics and management science techniques to solve problems in real-life.

In the programme, four specialisations are offered. These specialisations are *Business Analytics and Quantitative Marketing*, *Econometrics*, *Operations Research and Quantitative Logistics* and *Quantitative Finance*. In each of the specialisations, the objectives are to educate students in-depth in the sub-domain the specialisation addresses.

In case new areas of study or new fields of interest would emerge within the econometrics discipline, programme management may add the corresponding specialisation to the portfolio of specialisations mentioned.

Programme management drafted the programme intended learning outcomes. These specify in-depth and systematic knowledge and understanding of the specialisation, academic research skills and professional skills. The professional skills include communication skills, the sense of self-direction and originality in problem solving.

Programme management drafted a table, to show the correspondence of the intended learning outcomes of the programme to the Dublin-descriptors for master programmes. From this table may be deduced the programme intended learning outcomes match these Dublin-descriptors.

For each of the specialisations of the master programmes, an Advisory Boards with representatives of the professional field has been installed. These Advisory Boards are asked for advice on the intended learning outcomes and the curricula of these programmes.

#### *Considerations*

The panel welcomes the efforts of Erasmus School of Economics and of the economics programmes of Vrije Universiteit Amsterdam and of Wageningen University to draft the update of the 2009 domain-specific reference framework.

The panel supports the intentions of programme management to prepare students for positions in the labour market, equipping them with specialised knowledge of one of the sub-domains within the domain of econometrics. As a consequence, the panel welcomes the portfolio of the four specialisations which are offered in the programme.

The panel approves of the objectives of the programme, to educate students in one of the sub-domains of the econometrics discipline, to teach them thoroughly academic research knowledge and skills and to train them to acquire professional skills. The panel is especially positive about the strong research orientation of the programme.

The panel studied the intended learning outcomes of the programme and observes these to meet the programme objectives, exhibiting in-depth and systematic knowledge and understanding of the specialisation students have chosen, thorough academic research competencies, and a range of professional skills.

In the panel's view the programme learning outcomes are consistent with the domain-specific reference framework.

The panel ascertains the intended learning outcomes of the programme to match the Dublin-descriptors for master programmes and, therefore, to meet the requirements of a master level programme.

The panel regards the involvement of the professional field through the Advisory Boards in each of the specialisations within the programme to be satisfactory and to be helpful in aligning the programme with the requirements of the professional field.

#### *Assessment of this standard*

These considerations have led the assessment panel to assess standard 1, *Intended learning outcomes* to be satisfactory.

## 5.2 Standard 2: Teaching-learning environment

*The curriculum, staff and programme-specific services and facilities enable the incoming students to achieve the intended learning outcomes.*

### *Findings*

The responsibility for all of the programmes of the Erasmus School of Economics rests with the Dean of the School. The Vice Dean is the programme director of all of these programmes. Consequently, the quality of all of the programmes of the School is his responsibility. For each of the bachelor programmes, the bachelor coordinator monitors the processes of these programmes. The master coordinator takes care of the organisation of all of the master programmes. Academic directors are responsible for the curriculum and the teaching in the master specialisations. Programme management, being the programme director, the bachelor coordinators and the master coordinator, meet very regularly to discuss the organisation and the processes of the programmes. The academic directors meet to discuss the contents of the master specialisations. In each of the bachelor and master programmes, an Educational Committee, being composed of an equal number of lecturers and students, advises programme management on the programme quality. For all of the School's programmes, an Examination Board has the responsibility to monitor the examinations' and assessments' quality.

The number of students enrolling in the programme increased substantially in the last six years from an influx of 116 students in 2011 to an influx of 215 students in 2016. About 50 % of the incoming students are from the Erasmus School of Economics econometrics bachelor programme, about 15 % have a bachelor diploma of another Dutch university and about 10 % come from abroad. About 25 % of incoming students do not fully meet the entry requirements, having bachelor degrees in, among others, Engineering, Economics or Business Administration. These students are to take the pre-master programme.

Applicants having completed the Bachelor Econometrics and Operations Research of Erasmus School of Economics are admitted without condition. They may take any specialisation, regardless of their major specialisation in the bachelor programme. Incoming students with a bachelor degree of another Dutch university may be admitted without condition as well. Applicants coming from abroad have to show their diploma being equivalent to the Dutch diplomas, to be checked by programme management on the basis of Nuffic standards. In addition, these students should demonstrate proficiency in English. Incoming students with deficiencies have to take the one-year pre-master programme, which is offered in Dutch and in English.

Programme management presented tables in which the relations between the intended learning outcomes and the curriculum components of all of the specialisations have been specified. From these tables, it may be deduced that for each of the specialisations all of the intended learning outcomes are addressed in one or more courses.

The design of the curriculum is identical for all of the specialisations. Students take seven core courses (4.0 EC each), one seminar (12.0 EC), prepare the master thesis in the course *Master Thesis Proposal* and complete the programme with the master thesis. In the specialisation *Econometrics*, students may select one elective from a list of six courses. In the other three specialisations, all courses are mandatory and no electives are offered.

The core courses address the subjects of the specialisation and are meant to teach students the theoretical and methodological knowledge of the specialisation. Some of these courses are shared by specialisations, but most of them are specific for one of the specialisations. In the core courses, students are especially trained in quantitative skills. In the seminars, students apply and integrate the knowledge, they acquired in the courses. These seminars are meant to bridge the gap between theory and practice and to educate students to meet the challenges of the specialisation. In these seminars, students work in groups, address problems from the professional practice, often put forward by companies. Students are to formulate problem statements, to model the problem, to propose solutions to the problem and to implement these solutions. In addition, they are to communicate their findings and considerations orally and in writing. In preparation of the master thesis, students draft their thesis proposal in the *Master Thesis Proposal* course. In the master thesis, students are required to show having achieved all the learning outcomes of the programme, writing an individual research paper. They may combine the thesis with an internship. For the internships, no credits are awarded in the programme. The students with whom the panel met during the site visit, expressed being very positive about the contents of the curriculum, describing it as providing a profound training in the specialisation they had chosen and being strongly related to the professional practice. Especially the seminars were considered by these students to be very helpful in learning how to address, to reflect on and to discuss practical problems and to present findings and considerations orally and in writing.

To give an example of the curriculum of one of the specialisations offered, the core courses in the specialisation *Business Analytics and Quantitative Marketing* are *Multivariate Statistics and Data Visualisation*, *Bayesian Econometrics*, *Computer Science for Business Analytics*, *Applied Micro-econometrics*, *Advanced Marketing Models*, *Machine Learning* and *Topics in Advanced Statistics*. The seminar in the curriculum is *Seminar Case Studies in Business Analytics and Quantitative Marketing*.

The coherence of the curriculum is discussed on a regular basis by programme management and is, for each of the specialisations, monitored by the academic directors. The master thesis processes are organised by the thesis coordinators, one coordinator being responsible for each one of the specialisations.

The educational principle of the programme is mainly directed towards enabling students to achieve the intended learning outcomes. Study methods in the courses are plenary lectures and may include assignments. In the seminars, the classes are small with a maximum of 24 students in the seminar and students work intensively on assignments. Students work together in teams of four students. Additional funds have been made available by Erasmus School of Economics to promote small-scale teaching in specialisations with large student populations. The student-to-staff ratio of the programme is 22 : 1. The students with whom the panel met, regarded the courses and the seminars to ensure relatively small-scale teaching in the programme. The number of contact hours is on average 7 hours per week. The programme director explained Erasmus School of Economics to be experimenting with new study methods, such as MOOC's. Implementation of these methods has just started.

Programme management has taken a number of measures to foster the students' study pace and to raise the student success rates. Entry requirements are strict, to ensure students having the capacities to complete the programme. Small-scale teaching may foster students' study pace as well. Students may turn to study advisors in case of study problems. The proportion of students completing the programme in one year was in the last four years on average 11 %, whereas the figure for completion in two years was on average 63 % in the last three years.

Lecturers are appointed at one of Erasmus School of Economics departments, being the Departments of Applied Economics, Business Economics, Econometrics or Economics. Lecturers are to qualify for one of the research institutes of the School. The panel studied the list of publications by staff members, lecturing in the programme. Lecturers are to demonstrate their skills in education by obtaining the BKO-certificate. Lecturers may have an exemption, if they have been rated 3.5 on a 5-point scale in student evaluations of five separate courses. Course evaluations are part of the annual lecturers' performance interviews. Of the lecturers, 92 % have obtained a PhD, whereas 71 % are in possession of the BKO-certificate or have been exempt. Another 8 % of the lecturers are in the process of obtaining this certificate.

#### *Considerations*

In the panel's opinion, the admission requirements and the admission processes are well designed and strict, allowing only students in, who may be regarded to have the capacities to complete the programme. The panel is positive about the pre-master programme for students with deficiencies.

The curriculum reflects all of the intended learning outcomes of the programme adequately and evenly. The panel considers the curriculum to be very well designed and effective in teaching students in-depth the theory of the specialisation they have chosen and the quantitative skills needed to model and address problems in the field of the specialisation. In addition, students are offered ample opportunities to address real-life problems. The students with whom the panel met, expressed to be very positive about the curriculum contents and the relation to the professional practice.

The panel approves of the educational principles and the study methods of the programme, as they foster the students achieving the intended learning outcomes. Students and lecturers expressed being positive about the small-scale dimension of the programme. The panel feels the programme to be well managed in this respect. The panel welcomes the steps Erasmus School of Economics takes to ensure small-scale teaching, even in relatively large-scale specialisations. The panel regards the number of contact hours to be satisfactory.

Programme management has taken steps to raise the student success rates. The panel regards the student success rates to be appropriate and encourages programme management to try and raise these further. The panel recommends to improve the information provided to the students. For the communication, the School uses various platforms (Blackboard, Sin-online, Osiris), which is not very transparent for students.

The panel finds the research records of the lecturers impressive, as may, among others, be deduced from the list of their publications. In addition, the panel approves of the lecturers' educational capabilities. The proportion of lecturers holding the BKO-certificate is very substantial.

#### *Assessment of this standard*

These considerations have led the assessment panel to assess standard 2, *Teaching-learning environment* to be good.

### 5.3 Standard 3: Assessment

*The programme has an adequate assessment system in place.*

#### *Findings*

The examinations and assessments of this programme, as of all the other programmes of the Erasmus School of Economics, are governed by the Erasmus School of Economics Examination Policy. This Examination Policy provides the framework for the examinations and assessments for each of the bachelor and master programmes of the School. In addition, the Examination Board publishes each academic year the Rules and Regulations for the examinations and assessments. These may deviate on certain points from the Rules and Regulations of the previous year. The examination regulations and procedures are very similar, if not identical for all of the programmes of the School.

For all the programmes of the Erasmus School of Economics, one single Examination Board has been installed. The Examination Board works in accordance with applicable Dutch law. The Board, among others, assures the quality of examinations and assessments, appoints examiners, grants exemptions, handles cases of fraud, advises on the Teaching and Examination Regulations and ensures programmes complying with these Regulations.

In the context of the Examination Policy of the School and the Rules and Regulations of the Examination Board, a number of measures have been taken by programme management to ensure the validity of examinations, the reliability of assessments and the transparency of the examination processes. To enhance the validity of the examinations, each of the examinations is prepared by one of the lecturers and is presented to another lecturer for review. On recommendation by the management of the various programmes, the Examination Board appoints the examiners for the course examinations and for the thesis assessments. The examiners meet specific requirements, set by the Examination Board. In the case of master theses, one of the examiners should hold a PhD. The results of each of the examinations in the School are analysed. Should the pass rate be outside of the 50 % – 90 % range, the Examination Board will inspect the examination more closely to check the reliability of the assessment. Every year, the Examination Board inspects about 40 theses from this and other programmes of Erasmus School of Economics to verify if these meet the requirements set and have been assessed in a correct way. The grades of the theses in the sample range from 5.5 to 7.0 and 9.0 and more. About eight members of the Board are involved, covering the various sub-disciplines of the programmes. If the Examination Board finds one or more of the theses unsatisfactory, these will be discussed with the academic director of the specialisation and through him or her with the examiners. To promote the transparency of the examinations, students are informed about the assessment criteria of the courses, are provided with model examinations and may inspect the grading of their work.

Examination methods include written examinations with open questions, mid-term tests, oral examinations, individual and group assignments and presentations. No multiple-choice examinations are used to test the students' knowledge. In most of the courses, multiple examinations are to be taken by the students and the final grade of the courses is a composite grade, this being the weighed outcome of the grades of the course components.

At the end of the programme, students are required to complete their thesis. For each of the master specialisations, a thesis manual has been drafted by the thesis coordinator of the department or section involved. Students are entitled to guidance during the thesis writing process by a supervisor, being a lecturer in the programme. The Erasmus School of Economics is in the process of implementing the

*Thesis Workflow System.* This system has been implemented in the master programmes of the School. This system is an ICT-system, allowing to monitor the thesis writing process and the thesis assessment process more consistently and in a more organised way. The thesis proposal is to be approved by the thesis supervisor, before the student can start writing the thesis. The student needs to present drafts of the thesis to be discussed with the supervisor. In the Thesis Workflow System, the supervisor may check more easily the progress of the student and his meeting the requirements in the process, such as uploading the approved proposal. The students with whom the panel met, were not very content with the information about the thesis process and the thesis assessment.

Theses are assessed by both the thesis supervisor and the second assessor. The assessment criteria for the thesis are the same across the master specialisations. These criteria are to be assessed using a Likert-scale, ranging from unsatisfactory to excellent. The supervisor assesses the thesis process, including the degree of independent work on the part of the student and assesses the report. The second assessor only assesses the written report. These two examiners review and grade the thesis independently and meet to arrive at the final grade. In the master specialisations, an oral defence of the thesis by the student is mandatory. Theses are checked for plagiarism and plagiarism scores are mentioned on the assessment form.

#### *Considerations*

The panel approves of the examination and assessment policies and rules and regulations of the Erasmus School of Economics, in force for this and the other programmes of the School. They ensure the validity of the examinations, the reliability of the assessments, the competencies and expertise of examiners and the transparency of the examination processes.

The panel considers the Examination Board to have the responsibilities and to work along the lines, as intended by Dutch applicable law. The Board monitors the examination and assessment processes, analyses the examinations and regularly inspects the theses.

The panel approves of the examination methods, programme management has selected. The diversity of examination methods in courses and across courses allows for the assessment of both knowledge and skills, relevant to the programme.

In the panel's view, the thesis process is satisfactorily organised, especially since the Thesis Workflow System has been implemented. The panel recommends to inform students more clearly and more comprehensively about the thesis process and the thesis assessment. The assessment of the theses is a reliable process, as two examiners are involved and sound assessment forms with relevant assessment criteria are used. The panel recommends considering using weighted criteria in the thesis assessment.

#### *Assessment of this standard*

The considerations have led the assessment panel to assess standard 3, *Assessment* to be satisfactory.

## 5.4 Standard 4: Achieved learning outcomes

*The programme demonstrates that the intended learning outcomes are achieved.*

### *Findings*

In 2014 – 2015, the average grade for the master theses as estimations for the learning outcomes achieved by the graduates, was 7.8. In the same year, the proportion of students graduating cum laude was 13 %.

As has been mentioned when discussing standard 1, the graduates of the programme are trained to enter the labour market. Graduates have very good career perspectives and tend to find suitable and well-paid positions relatively shortly after their graduation. They are employed by a wide variety of organisations, such as consultancy companies, banks, research institutes and governmental organisations. Some of the graduates continue their career in the academic world as a PhD-student.

### *Considerations*

The panel studied the examinations of a number of courses in the programme. The panel establishes these examinations to be of adequate quality and of an appropriate level. The examinations are considered by the panel to be challenging and well elaborated and to meet the courses' learning goals. As the panel observed, students will have achieved most of the programme intended learning outcomes, if they have passed all of these examinations.

The panel studied six theses of students in the programme. These theses are assessed by the panel to be at least satisfactory and some of them very good. Generally, the panel would have given a somewhat higher grade for the theses than the programme examiners.

### *Assessment of this standard*

The considerations have led the assessment panel to assess standard 4, *Achieved learning outcomes* to be good.

## 6. Recommendations

In this report, a number of recommendations have been listed. For the sake of clarity, these are brought together below. The recommendations are the following.

- To improve the information provided to the students by aligning the different communication platforms.
- To inform students more clearly and more comprehensively about the thesis process and the thesis assessment.
- To consider using weighted criteria in the thesis assessments.

## Annex 1: Site visit schedule

The site visit was conducted in Rotterdam on 1 December 2016 and on 2 December 2016.

Site visit schedule for 1 December 2016.

08.30 h. – 09.00 h.	Arrival and deliberations panel (closed session)
09.00 h. – 09.45 h.	Board Prof. dr. Ph.H.B.F. Franses (Dean Erasmus School of Economics), prof. dr. I.J.M. Arnold (Vice Dean Erasmus School of Economics, programme director), W. Rowaan MA (senior policy adviser Education Erasmus School of Economics)
09.45 h. – 10.45 h.	Programme management/core lecturers Bachelor Economics and Business Economics Programme management/core lecturers Master Economics and Business Dr. B. Hoogendoorn (bachelor coordinator, Bachelor), dr. N.L. van der Sar (lecturer, Bachelor), dr. J. Delfgaauw (academic director Economics and Organisation track, Master), prof. dr. K.I.M. Rohde (academic director Behavioural Economics track, Master), prof. dr. J.T.J. Smit (academic director Financial Economics track, Master), prof. dr. T.G.M. van Ourti (academic director Health Economics track, Master)
11.00 h. – 11.45 h.	Lecturers/thesis examiners Bachelor Economics and Business Economics Lecturers/thesis examiners Master Economics and Business Dr. B. Karreman (lecturer/thesis examiner, Bachelor/Master), dr. V. Volosovych (lecturer/thesis examiner, member Education Committee, Bachelor/Master), dr. B.S.Y. Crutzen (lecturer/thesis examiner, Bachelor), dr. S.H. Bijkerk (lecturer/thesis examiner, Bachelor/Master), dr. A.C. Gielen (lecturer/thesis examiner, Bachelor/Master), dr. E.M. Bosker (lecturer/thesis examiner Bachelor/Master), dr. V.G. Hariharan (lecturer/thesis examiner, Bachelor/Master)
11.45 h. – 12.30 h.	Students and alumni Bachelor Economics and Business Economics Students and alumni Master Economics and Business D. Vodegel (student, member Education Committee, Dutch track, Bachelor), D.O. Anshah (student, member Education Committee, international track, Bachelor), R.T. van den Oord BSc (alumnus), T. Koning BSc (student, Master), M.A.J. van Hulsen BSc (student, Master), A.M.R. Woodend MSc (alumna), T. Reijnen MSc (alumnus)
12.30 h. – 13.30 h.	Lunch panel (closed session), open office hours 12.30 h. – 13.00 h.
13.30 h. – 14.30 h.	Programme management/core lecturers Bachelor Econometrics and Operations Research Programme management/core lecturers Master Econometrics and Management Science Dr. H.J.W.G. Kole (bachelor coordinator, Bachelor), prof. dr. D.J.C. van Dijk (academic director Quantitative Finance track, Master), prof. dr. A.P.M. Wagelmans (lecturer Operations Research and Quantitative Logistics track, Master), prof. dr. D. Fok (academic director Business Analytics Quantitative Marketing track, Master), prof. dr. R. Paap (academic director Econometrics track, Master)

- 14.30 h. – 15.15 h.      Lecturers/thesis examiners Bachelor Econometrics and Operations Research  
Lecturers/thesis examiners Master Econometrics and Management Science  
Dr. C. Heij (lecturer/thesis examiner, chair Education Committee, Bachelor), dr. W. van den Heuvel (lecturer/thesis examiner, member Education Committee, Bachelor/Master), prof. dr. P.J.F. Groenen (lecturer/thesis examiner, Bachelor/Master), dr. R. Spliet (lecturer/thesis examiner, member Education Committee, Bachelor/Master), dr. M. van de Velden (lecturer/thesis examiner, Bachelor/Master), dr. E. Oldenkamp-Bazsa (lecturer/thesis examiner, Bachelor)
- 15.30 h. – 16.15 h.      Students and alumni Bachelor Econometrics and Operations Research  
Students and alumni Master Econometrics and Management Science  
T.T. Wiemann (student, member Education Committee, international track, Bachelor), L. Li (student, Dutch track, Bachelor), M.T. Graftiaux (student, international track, Bachelor), M. van Breugel BSc (student, member Education Committee, Master), H.S. Doytchinova BSc (student, Master), L.W. Maassen MSc (alumnus), O.R. Pidenko MSc (alumna)
- 16.15 h. – 17.45 h.      Deliberations panel (closed session)
- Site visit schedule for 2 December 2016.
- 09.00 h. – 10.00 h.      Examination Board, all programmes  
Prof. dr. J.M.A. Viaene (chair Examination Board), prof. dr. A. Dur (vice-chair Examination Board), drs. V.H.M. Beerkens (secretary Examination Board), K. Goudzwaard-Noot MSc (secretary Examination Board)
- 15.30 h. – 15.45 h.      Board (second meeting)  
Prof. dr. Ph.H.B.F. Franses (Dean Erasmus School of Economics)
- 15.45 h. – 17.00 h.      Deliberations panel (closed session)
- 17.00 h. – 17.30 h.      Main findings presented by panel chair to Dean and programme management

## **Annex 2: Documents reviewed**

The panel studied the following documents, presented prior to the site visit

- Self-Assessment Report Master Econometrics and Management Science
- Areas and actions for improvement
- Domain-specific reference framework
- Matrix Dublin descriptors and intended learning outcomes
- Relation intended learning outcomes and curriculum
- Overview of curriculum
- Organisational structure of programme
- Overview teaching staff
- List of theses 2014 – 2015 and 2015 – 2016
- Teaching and Examination Regulations
- Annual Report of Examination Board
- Erasmus School of Economics Education Statistics
- Publication List Erasmus School of Economics

Prior to the site visit, panel members were given access electronically to course manuals and course material

On the day of the site visit, programme management presented the following documents

- Course material of a number of selected courses of the programme
- Examinations of a number of selected courses of the programme
- Programme Committee reports
- Examination analyses

### **Annex 3: Theses reviewed**

The theses of the following six students have been selected for review by the panel.

- 335829
- 335756
- 330381
- 355756
- 382859
- 326181

## Annex 4: Assessment panel composition

The assessment panel had the following composition:

- Prof. dr. T.J. Wansbeek, Emeritus Professor of Statistics and Econometrics, University of Groningen (panel chair);
- Prof. dr. J. Hartog, Emeritus Professor of Microeconomics with visiting scholar position, University of Amsterdam (panel member);
- Prof. dr. R. Kabir, Professor and Chair of Corporate Finance and Risk Management, University of Twente (panel member);
- S.M. van den Hoek, student Bachelor programme Tax Economics, University of Amsterdam (student member).

Prof. dr. T.J. Wansbeek, panel chair

Mr. Wansbeek is Emeritus Professor of Statistics and Econometrics at University of Groningen. He took his doctorate from University of Leiden. Among others, he held positions as Professor of Microeconomics at University of Amsterdam, as the Dean of the Faculty of Economics and Business of University of Amsterdam and as the Dean of the Faculty of Economics of University of Groningen. He was and is an editorial board member of a series of academic journals, such as *Journal of Econometrics*. Mr. Wansbeek held and holds a number of visiting scholar positions at, among others, University of Southern California, United States and Zhejiang University, China.

Prof. dr. J. Hartog, panel member

Mr. Hartog is Emeritus Professor of Microeconomics at University of Amsterdam, holding a visiting scholar position at this university. He took his doctorate from Erasmus University Rotterdam. At this university, he held the position of researcher and associate professor, subsequently becoming Professor of Microeconomics at University of Amsterdam. He held a number of visiting positions at universities in countries Europe, the United States and Asia. He also was an editor and referee for a number of international academic journals. Mr. Hartog is a member of the Royal Netherlands Academy of Sciences.

Prof. dr. R. Kabir, panel member

Mr. Kabir is Professor and Chair of Corporate Finance and Risk Management at University of Twente and Head of the Department of Finance and Accounting. He took his doctorate from Maastricht University. He held visiting scholar positions at, among others, Central University of Finance and Economics, Beijing, China, New York University, United States and University of Melbourne, Australia. Before becoming Professor at University of Twente, Mr. Kabir was Associate Professor of Finance at Tilburg University and Professor of Finance at University of Stirling, United Kingdom.

S.M. van den Hoek, student member

Ms. Van den Hoek is a student in the Bachelor programme Tax Economics of University of Amsterdam. She has taken on a number of extra-curricular activities, such as being the chair of the Student Association of her programme and being a member and the chair of the Student Council of the Faculty of Economics and Business of University of Amsterdam. In addition, Ms. Van den Hoek is employed by Canal Company as a guide and a host.