
EMOS – Towards a unified training of European public statisticians



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TITLE

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RÉSUMÉ

L'article décrit comment est née l'idée de créer un Master européen en statistiques officielles (European Master in Official Statistics, EMOS), comment le concept a été développé et mis en œuvre, ainsi que certains des défis qui restent à relever pour l'avenir.

Mots-clés : *master, statistiques officielles, Europe, Eurostat, Système statistique européen.*

ABSTRACT

The article describes how the idea to launch a European Master in Official Statistics (EMOS) was born, how the concept was developed and implemented, as well as some of the challenges that remain for the future.

Keywords: *master, official statistics, European, Eurostat, European Statistical System.*

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1. Introduction

In order to understand the context in which the European Master in Official Statistics was launched, it is important to first briefly explain the roles and responsibilities of two of the main actors behind EMOS, Eurostat and the European Statistical System.

Eurostat is a Directorate-General of the European Commission and the statistical office of the European Union. Its mission is to provide high-quality statistics for Europe. As explained in the Regulation on European Statistics² and in the Commission Decision on Eurostat³, Eurostat ensures the development, production and dissemination of European statistics according to established rules and statistical principles, notably those laid down in the European statistics Code of Practice⁴. Moreover, Eurostat coordinates the statistical activities of the institutions and bodies of the Union, in particular with a view to ensuring consistency and quality of the data and minimising reporting burden.

The European Statistical System is the partnership between the statistical authority of the Union, which is the European Commission (Eurostat), and the National Statistical Institutes (NSIs) and other national authorities responsible in each Member State for the development, production and dissemination of European statistics. This partnership also includes the European Economic Area and European Free Trade Association countries.

The European Statistical System functions as a network in which Eurostat's role is to lead the way in the harmonisation of statistics, through the harmonisation of methodologies, concepts and classifications, in close cooperation with the national statistical authorities, which collect the data in the agreed format and transmit them to Eurostat. Eurostat consolidates the data, produces European aggregates and publishes high-quality comparable European statistics. As EU cooperation covers more and more EU policy areas, the harmonisation of statistics has over the years been extended to nearly all statistical fields.

2. The European Master in Official Statistics (EMOS)

2.1 What is EMOS?

EMOS is essentially a label that is awarded by the European Statistical System Committee to university Master programmes that fulfil the EMOS eligibility and selection criteria (see Section 2.3.3) of higher level education in the field of official statistics. For the moment, there are 32 EMOS-labelled Master programmes in 19 European countries. The label is valid for four years and renewable under condition that the criteria are still fulfilled. An important part of the selection criteria is that the university applying for the label should have an established cooperation with the national statistical institute or another authority producing official statistics. This ensures that the gap between theory and practice is bridged in a good way. Indeed, one of the requirements is that the Master theses and the internships, which are compulsory, are carried out by students in the field of official statistics in close cooperation with a producer of official statistics.

2.2 Why was EMOS created?

The idea to create a European Master in Official Statistics was born against the backdrop of the very rapid evolution of the competences required to manage the whole stream of processes necessary to design, produce and disseminate official statistics and the need to strengthen the value of statistics in modern societies.

2. <https://eur-lex.europa.eu/legal-content/EN/TXT/?uri=CELEX:02009R0223-20150608>

3. <https://eur-lex.europa.eu/legal-content/EN/TXT/?uri=OJ:L:2012:251:TOC>

4. <https://ec.europa.eu/eurostat/documents/4031688/8971242/KS-02-18-142-EN-N.pdf/e7f85f07-91db-4312-8118-f729c75878c7>

As a starting position, the overall aim of EMOS was to provide postgraduate training in official statistics for professionals who are able to work with official statistics at different levels and to reinforce the collaboration between universities and producers of official statistics.

Early discussions on the establishment of a European Master in Official Statistics originate from parallel initiatives of, on the one side, the French national statistical institute and GENES⁵ and a few other national statistical institutes and, on the other, Eurostat. A common framework for training of “official statisticians” had already been discussed in the past, but the first real analysis was started at the “*Workshop on a European Master in Official Statistics*”, jointly organised by Eurostat and the University of Southampton in 2010, where national statistical institutes and academia from over 20 European countries gathered to brainstorm about this topic.

One of the conclusions was to create a group of volunteers to further reflect on how to take some of the ideas from the workshop forward. The group, which was chaired by the Italian national statistical institute, included participants from different national statistical institutes, universities and Eurostat. The work of the group resulted in a paper outlining a first set of ideas on how to establish the necessary framework, which was presented to the European Statistical System Committee in February 2012.

The following main objectives were defined:

- Reinforce the network of professional statisticians at international level.
- Strengthen the cooperation between academia and the ESS, e.g. on research topics of relevance for official statistics.
- Ensure a wider offer of higher education in the area of official statistics in Europe and curricula adapted to the changing needs of statistical authorities.
- Develop a shared vision on methodology, organisation and management of the production of European statistics, by involving both academia and the European Statistical System as teaching parties in EMOS.
- Meet training and recruitment needs by constituting a future recruitment pool of highly educated professional statisticians for the European Statistical System.

2.3 How was the EMOS concept developed?

Once Eurostat and the European Statistical System Committee had agreed to go ahead with EMOS, a feasibility study was launched in order to assess both feasibility and interest among the main stakeholders. It was also necessary to come up with a governance structure and to define the conditions under which Master programmes could join the EMOS network.

2.3.1 Feasibility study

The main objectives of the feasibility study, which was carried out by a consortium of ICON-INSTITUT Consulting Group and GENES, were to:

- Provide an inventory of Master programmes in statistics and their providers in the selected countries.
- Analyse the existing and potential Master programmes in official statistics and assess if they were suitable for joining a future European network of Masters in official statistics.
- Assess the interest of stakeholders – in particular universities and NSIs.
- Analyse advantages/disadvantages, the cost-benefit, labelling mechanisms as well as the role and implications for NSIs and Eurostat.
- Propose a roadmap for the implementation of EMOS.

5. Le Groupe des Écoles Nationales d'Économie et Statistique (GENES) is a public institution of higher education and research attached to the Ministry of Economy and Finance, for which INSEE provides human support and technical oversight. On the reverse side, it provides the initial training of INSEE's executives.

The feasibility study started in December 2012 and took one year to complete. It was divided into three phases.

In the first phase, a quantitative online survey was launched among universities offering Masters in statistics in 39 different European countries. The survey addressed issues such as the Master programme's alignment with the Bologna process and the European Credit and Transfer System (ECTS), the duration of the Master, the existence of a scientific committee, accreditations rules, the fields of the Master and existing cooperation with the national statistical institute. Out of the over 700 universities addressed by the survey, 151 valid replies were received.

In the second phase, 41 universities and 14 national statistical institutes in 14 different countries were interviewed to assess their willingness to participate in the EMOS network, the structure of the Master and its international relevance, cooperation between the university and the National Statistical Institute and the availability of resources (e.g. communication tools, computers, courses in English).

The results of the two surveys showed that:

- The Bologna Process was adhered to in almost all countries.
- Almost all Master programmes had a scientific committee and an accreditation system in place.
- Two thirds of the Masters had connections with the NSI.
- Almost all Masters had a traditional educational structure with lecturers and academic staff.
- At least 25 programmes would be ready to implement EMOS based on the criteria proposed by the feasibility study with only minor changes in their curricula. Other universities would be willing to join, but their Masters were not fulfilling all the criteria yet.
- A majority of participating countries were interested in EMOS, as long as there would be no impact on the core programme of their existing Master, as this could imply accreditation issues.
- Two categories of Master programmes could be distinguished: the professional Masters and those more focused on research.
- Financing was a concern for some universities, notably for staff and teacher exchanges, as well as course material in English.
- In some countries, issues such as political and economic specificities, existing regulations of higher educational systems and English as the main teaching language, would need to be carefully considered.

In a third phase, an analysis of advantages and disadvantages, cost-benefits, labelling mechanisms as well as roles and implications of stakeholders were analysed and a concept for a possible European Master in Official Statistics prepared.

The most important recommendations from the feasibility study were the following:

- Given the different national accreditation procedures for new Master programmes and the complexity of such procedures in most countries, it was recommended to implement EMOS as a label for already existing Master programmes, which comply with a set of EMOS criteria. In other words, rather than creating a new Master from scratch without certainty about its attractiveness among students, the aim would be to build on already existing programmes, by adding an EMOS module ensuring a lowest common denominator of statistical knowledge and skills.
- To avoid accreditation issues, EMOS should have no major impact on the core parts of the existing Master programmes.

A Group of Experts (composed of universities, NSIs and Eurostat), was asked to accompany the feasibility study and to develop a proposal for a concrete draft curriculum, rules and conditions for Master programmes to join the network (labelling), as well as a governance structure.

2.3.2 Governance

The governance model that was suggested involved the following main actors: universities, a Board, the European Statistical System Committee and Eurostat. The structure and the actors' respective roles are briefly explained below.

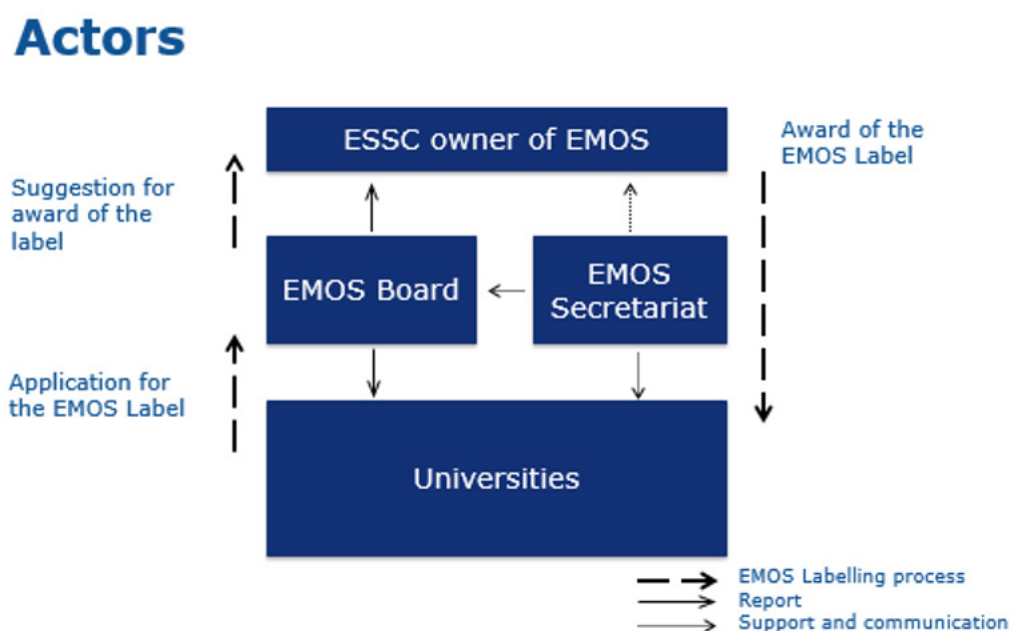


Figure 1 – EMOS Governance model

(i) The European Statistical System Committee

The European Statistical System Committee⁶ is the highest level committee within the European Statistical System. It is composed of all Directors General of the national statistical institutes in the EU and EFTA countries, with a number of observers, notably the Directorate General for Statistics of the European Central Bank.

In the EMOS governance model (see Figure 1), the European Statistical System Committee is the owner of the EMOS label and as such the authority that awards the label to Master programmes fulfilling the EMOS requirements. It may consult the Board on any matter relating to education and training in official statistics and it also nominates the members of the EMOS Board.

(ii) Universities

Universities that are interested and fulfil the criteria may apply for the EMOS label through calls for applications organised by the EMOS Secretariat. The label is awarded for four years, after which the university can re-apply for the label if they still fulfil the requirements. In order to ensure feedback on quality, attractiveness and potential changes to the curricula of EMOS-labelled programmes, universities are also required to provide an annual report to the EMOS Board.

6. <https://ec.europa.eu/eurostat/web/european-statistical-system/ess-governance-bodies/essc>

(iii) EMOS Board

The mandate of the EMOS Board was approved by the European Statistical System Committee in September 2014. Its main role is to advise the European Statistical System Committee on matters relating to EMOS and report back to it. More specifically, the Board:

- assists the European Statistical System Committee with regard to the development of EMOS, in particular the award of the EMOS label to Master programmes fulfilling the EMOS requirements.
- contributes to quality monitoring of the EMOS Master programmes in order to ensure that the required standards are achieved and maintained through evaluation of new applications and extensions of the EMOS label.
- assists the European Statistical System Committee in meeting learning and development needs in the European Statistical System and advises on questions relating to higher education and training in official statistics, as well as further contributes to an exchange of experiences and good practices in the area of EMOS.

The chair of the Board may also advise the European Statistical System Committee to consult the Board on a specific question.

The first EMOS Board was appointed by the European Statistical System Committee in November 2014 for a period of three years. The Board is chaired by Eurostat and has 13 other members: six from universities, five from national statistical institutes, one from a national central bank and one from the European Statistical Advisory Committee⁷.

(iv) EMOS secretariat

The EMOS secretariat is organised and staffed by Eurostat. The secretariat is responsible for all administrative and organisational matters. It organises the meetings and provides support to the EMOS Board, in particular in the EMOS label application process, and prepares the EMOS Board's recommendations and reports to the European Statistical System Committee. The secretariat also ensures communication and promotion of EMOS through a dedicated website and regular communication with the EMOS network and other interested parties.

2.3.3 Labelling

Given the national differences regarding the accreditation of new Master programmes, which became evident in the feasibility study, it was decided to implement EMOS as a label for existing Master programmes fulfilling certain requirements. A label can be considered as a supplement to accreditation and offers the necessary flexibility for universities wishing to introduce EMOS, without implications on national accreditation practices. It was agreed that the EMOS label must stand for excellence in European statistics and apply quality standards recognised by all concerned stakeholders.

Two sets of criteria were established, eligibility and selection criteria, as explained below.

(i) Eligibility criteria

The three eligibility criteria are:

- The Master programme should be an already accredited Master programme in an EU Member State, an EU candidate country or an EFTA country.
- The programme should be in line with the Bologna process.
- The programme should be in line with the European Credit Transfer and Accumulation System (ECTS).

7. <https://ec.europa.eu/eurostat/web/european-statistical-system/ess-governance-bodies/esac>

(ii) Selection criteria

As part of the selection criteria, the Master programme should have a workload equivalent to at least 90 ECTS, whereof:

- at least 50 ECTS should be devoted to the EMOS learning outcomes (see Figure 2 below);
- a Master thesis on a topic of official statistics, worth at least 20 ECTS;
- an internship in official statistics worth at least 10 ECTS, or, of at least 6 weeks' duration in cases where the university's rules do not allow awarding ECTS to the internship.

In addition, any university applying for the EMOS label should demonstrate that it has an active cooperation with the respective national statistical institute or other producers of official statistics, which is particularly important for the purposes of teaching, supporting Master theses and hosting internships. Moreover, the application should demonstrate that the programme includes lecturers with a sufficiently solid background in official statistics. Applicants also have to commit to starting their EMOS-labelled Masters at the latest one year after having been labelled.

The five EMOS learning outcomes have been designed to clarify what an EMOS student is expected to have learnt when graduating (see Figure 2).



Figure 2 – *EMOS Learning outcomes*

1. The system of official statistics (e.g. relevance of official statistics, organisation and role of the European statistical system and other official data producers, main national, European and international institutions and data sources, principles of the European Statistics Code of Practice).
2. Production models and methods used for official statistics (including the use of multisource statistics and related quality dimensions).
3. Specific themes (e.g. economy, finance, population and social conditions, international trade, environment, energy, science and technology) and related methodological issues.
4. Statistical methods (e.g. sampling and estimation techniques, index theory, econometrics, statistical programmes).
5. Dissemination (communicating statistics to different audiences, use of different tools for

disseminating data and metadata, confidentiality and disclosure control).

3. EMOS Activities

At the start of EMOS in 2014, a lot of work had to be devoted to developing the rules and procedures for EMOS, raising awareness about the project, putting in place the governance structure and its reporting lines. Subsequently, three rounds of labelling were implemented and a number of activities to foster cooperation and sharing of experiences within the EMOS network, as briefly described below.

3.1 Labelling

The main role of the EMOS Board and its most time-consuming task has until now been the labelling process, involving amongst others the evaluation of the applications received for the EMOS label and the preparation of recommendations for the European Statistical System Committee, as owner of the EMOS label.

As mentioned above, the label is valid for four years, meaning that universities that wish to maintain their label need to re-apply for it and prove that they still fulfil the EMOS criteria. Assessing these applications is also part of the EMOS Board's activities and follows the same procedure as for the initial labelling.

In addition, the EMOS Board monitors the quality of the labelled programmes through the annual reporting by universities.

As shown in Figure 3, there are now 32 EMOS labelled Master programmes in 19 countries.



Figure 3 – Map of EMOS labelled universities

3.2 Webinars

Series of online lectures (webinars) on topics of official statistics are organised on a regular basis with speakers from cooperating universities, national statistical offices and Eurostat. The webinars are one-hour long and includes the possibility for students across Europe to interact with the lecturers. The webinars are freely accessible.

3.3 Workshops

Approximately, once per year an EMOS workshop is organised for representatives from EMOS-labelled Master programmes, national statistical institutes and the EMOS Board.

Participants discuss topics of common interest and can learn from each other's experiences. Examples of past topics include: Value and benefits of EMOS, the European dimension of EMOS, the role of NSIs and NCBs, teaching material for official statistics, Master theses and internships, audio-visual and online tools, best practices in teaching, official statistics and research. Last, but not least, an important part of the workshop is networking.



Illustration 1 – EMOS Workshop in Ljubljana, March 2018 (photo: Francine Kessler)

3.4 European Statistical Week and EMOS Open Days

The European dimension of EMOS becomes very concrete during two particular events organised by Eurostat on an annual basis, the European Statistical Week and the Open Days.

The European Statistical Week is a one-week study visit to Eurostat included in the European Statistical Training Programme⁷. The study visit, which is primarily targeted at young statisticians already working in a national statistical institute, also sees the participation of 10-15 EMOS students every year.

During this week, two and a half days are devoted to lectures where the students learn more about Eurostat and the European Institutions, the European Statistical System and statistical topics. Two days of job shadowing in a Eurostat unit are also included. The study visit provides participants with a concrete picture of what it is like to work at Eurostat and in the European Statistical System, which is usually highly appreciated by the participants. Moreover, useful contacts are established for future exchanges between colleagues from different national statistical institutes across Europe, as well as EMOS students.

For those in charge of EMOS-labelled Master programmes at the different universities, EMOS

7. <https://ec.europa.eu/eurostat/fr/web/european-statistical-system/training-programme-estp>

Open Days are organised. Like in the study visits mentioned above, participants in the Open Days learn more about Eurostat and the European Statistical System and some of the most important ongoing statistical work for the moment. They also have the opportunity to discuss EMOS related matters with Eurostat's senior management and get to meet and exchange with peers in other countries.

3.5 Master thesis competition

For the first time in 2018, an EMOS Master thesis competition was organised. The purpose of the competition was to reward outstanding Master theses amongst the network of, then, 23 EMOS labelled programmes. Its aim was to highlight official statistics as a research topic and put forward young talents with innovative contributions. The submitted Master theses were evaluated by the EMOS Board based on a set of clearly defined criteria and as a result, five Master theses were selected. The winners' prize was an invitation to present their theses at the New Techniques and Technologies for Statistics (NTTS) international biennial scientific conference⁹, organised by Eurostat, in March 2019 in Brussels, with the expenses covered by Eurostat. It was the first time the students presented their work to an international audience and at such a big conference. Based on the positive feedback received from the audience, a dedicated session on EMOS will be proposed also for the next NTTS conference in 2021.

4. Challenges for the future

In 2017, the EMOS Secretariat carried out a first assessment of the implementation of EMOS. Feedback was collected from the main stakeholders, i.e. students (both following an EMOS-labelled Master programme and other Masters) universities (with and without EMOS-labelled Master programmes), producers of European statistics and the EMOS Board. After only two rounds of labelling, there was at the time not yet a lot of experience with EMOS, nor many EMOS graduates. Nevertheless, most of the findings were confirmed in subsequent annual reports submitted by universities.

While the feedback showed that EMOS was on the right track, had increased cooperation between universities and producers of official statistics and had successfully managed to link theory and practice, much thanks to the compulsory internships in official statistics, it also revealed a number of challenges requiring further work:

- low number of students enrolled in EMOS programmes (many of which were already working in a national statistical institute)
- the European dimension, including activities at European level, such as student and teacher cross-border exchanges and similar
- curricula would need to be modernised to better cover topics linked to the use of new and multiple data sources, big data, etc.
- commitment from the producers of official statistics

Based on the evaluation, the European Statistical Committee asked the EMOS Board to follow up on a set of recommendations linked to these challenges. With 23 EMOS-labelled Master programmes at the time (2017), it was also agreed that there was still scope to extend the network, so the go-ahead was given for the launch a third call for applications in 2018.

As the EMOS network of labelled Master programmes has now reached as many as 32 programmes in 19 different countries, it was agreed that focus should no longer be on expanding the network, but more on integration. Nevertheless, interested universities may still join the EMOS network through the permanently open call for applications with annual cut-off dates for submission of applications (this year 31 December 2020)¹⁰.

9. https://ec.europa.eu/eurostat/cros/content/emos-events_en

10. https://ec.europa.eu/eurostat/cros/content/2020-emos-call-applications_en

The main challenges ahead will therefore be to attract students to EMOS and to strengthen the European dimension, e.g. by developing cross-border collaboration within the EMOS network through student and teacher exchanges and internships. Here there are numerous challenges, not least the language and financial issues, but there are recent positive examples, such as internships offered by INSEE, the French national statistical institute, to an EMOS student from other countries.

The commitment from the producer side to host internships and, like is the case in DESTATIS, the German statistical office, to mention EMOS as an advantage in vacancy notices, will be crucial for the attractiveness of EMOS in the future.

On the other hand, the producer side would like to see future EMOS graduates better equipped with skills and competences needed to manage a changing production system, including data science skills related to new and multiple data sources and modern tools. Here, universities will need to ensure that they can deliver by adapting their curricula to changing needs of future employers of EMOS graduates. By addressing the future skills needs, EMOS will be relevant and attractive for both employers and students.

Universities are also calling for common learning resources, including case studies, exercises with databases, simulations, games, quizzes, homework assignments, in particular for the learning outcomes where universities traditionally do not have sufficient teaching capacity unless they can rely on teaching staff from national statistical institutes (learning outcomes 1 and 5 mentioned above, as well as data science skills).

5. Conclusions

Since its launch, EMOS has grown from a simple idea to a network of 32 EMOS-labelled programmes in 19 countries across Europe. This in itself is a great achievement, which has only been possible thanks to the enthusiasm of all those involved. In fact, until now EMOS has been implemented with very little resources. And, as with all innovative projects, it takes more than enthusiasm for success, it takes serious commitment, hard work and resources as well. In the case of EMOS, the enthusiasm is definitely there, but the future level of ambition will be defined by the commitment of all stakeholders involved and the amount of resources they are ready to invest in EMOS. In the next year, a reflection on the level of ambition of EMOS will take place based on the progress made so far. The exciting journey started in 2009 has in fact just begun...