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Evaluation of Research Quality 2011-2014 (VQR 2011-2014)

Criteria for the Evaluation of Research Outputs

Group of Experts for Evaluation Area 07 Agricultural and Veterinary Sciences (GEV07)

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1. Introduction

This document describes the organization of the Group of Experts for Evaluation in Agricultural and Veterinary Sciences (now known as GEV07) and the criteria the Group will use in evaluating the research outputs. The document is divided into eight sections. In Section 2 the Scientific Sectors (SSD in brief, as in Italian), the Academic Recruitment Fields (ARF) and the ERC Sectors which are relevant for the GEV07 are listed. Section 3 summarizes the internal operating rules of the GEV07. Section 4 describes the evaluation criteria for the research outputs (*products* in the following). Section 5 describes the peer review process and the guidelines for the selection of external reviewers. Section 6 describes the bibliometric criteria: the journal databases, the journal metrics (JM), the bibliometric algorithm and the calibration procedure. Section 7 reports the classification range for specific products. Finally, Section 8 describes the way the GEV07 intends to solve any potential conflict of interest between the GEV07 members and the authors of research outputs.

2. Delimitation of the GEV07 Area

The GEV07 is in charge of evaluating the products submitted by researchers belonging to the Scientific Sectors (SSD), the Academic Recruitment Fields (ARF), and ERC Sectors (ERC) listed in Tables 1-3.



Table 1. Scientific Sectors (SSD), referred to Area 07, Agricultural and Veterinary Sciences.¹

Code and title	Scientific Sectors (SSD)
AGR/01	Agricultural Economics And Rural Appraisal
AGR/02	Agronomy And Field Crops
AGR/03	Arboriculture And Fruticulture
AGR/04	Vegetable And Ornamental Crops
AGR/05	Forest Management And Silviculture
AGR/06	Wood Technology And Forestry Operations
AGR/07	Agricultural Genetics
AGR/08	Agricultural Hydraulics And Watershed Protection
AGR/09	Agricultural Machinery And Mechanization
AGR/10	Rural Buildings And Agro-Forest Land Planning
AGR/11	General And Applied Entomology
AGR/12	Plant Pathology
AGR/13	Agricultural Chemistry
AGR/14	Pedology
AGR/15	Food Science And Technology
AGR/16	Agricultural Microbiology
AGR/17	Livestock Systems, Animal Breeding And Genetics
AGR/18	Animal Nutrition and Feeding
AGR/19	Animal Science
AGR/20	Aquaculture, Poultry And Rabbit Science
VET/01	Veterinary Anatomy
VET/02	Veterinary Physiology
VET/03	Veterinary Pathology
VET/04	Inspection Of Foods Of Animal Origin
VET/05	Infectious Diseases Of Domestic Animals
VET/06	Parasitology And Animal Parasitic Diseases
VET/07	Veterinary Pharmacology And Toxicology
VET/08	Veterinary Clinical Medicine
VET/09	Veterinary Clinical Surgery
VET/10	Veterinary Clinical Obstetrics And Gynecology

¹ MIUR (Ministry of Education, University and Research), Ministerial Decree 30 October 2015 n. 855, Annexe D

Table 2. Academic Recruitment Fields (ARF) referred to Area 07, Agricultural and Veterinary Sciences²

Code and title	Academic Recruitment Fields (ARF)
07/A1	Agricultural Economics And Appraisal
07/B1	Agronomy And Field, Vegetable, Ornamental Cropping
07/B2	Arboriculture And Forest Systems
07/C1	Agricultural, Forest And Biosystems Engineering
07/D1	Plant Pathology And Entomology
07/E1	Agricultural Chemistry, Agricultural Genetics And Pedology
07/F1	Food Science And Technology
07/F2 (actual 07/I1)	Agricultural Microbiology
07/G1	Animal Science And Technology
07/H1	Veterinary Anatomy And Physiology
07/H2	Veterinary Pathology And Inspection Of Foods Of Animal
07/H3	Infectious And Parasitic Animal Diseases
07/H4	Veterinary Clinical Medicine And Veterinary Pharmacology
07/H5	Veterinary Clinical Surgery And Veterinary Obstetrics

Table 3. Main ERC sectors for Area 07, Agricultural and Veterinary Sciences³

Code	ERC Sector
LS2_10	Bioinformatics
LS2_14	Biological systems analysis, modelling and simulation
LS3_9	Development, developmental genetics, pattern formation and embryology in animals
LS4_2	Comparative physiology and pathophysiology
LS4_6	Cancer and its biological basis
LS5_1	Neuroanatomy and neurophysiology
LS5_2	Molecular and cellular neuroscience
LS5_6	Developmental neurobiology
LS6_7	Microbiology
LS6_8	Virology
LS6_9	Bacteriology

² MIUR (Ministry of Education, University and Research), Ministerial Decree 30 October 2015 n. 855, Annexe D

³ EU. ERC Frontier Research Grants – Information for Applicants to the Starting and Consolidator Grant 2016. Calls, October 2015, p. 45 and followings.



LS6_10	Parasitology
LS6_11	Prevention and treatment of infection by pathogens (e.g. vaccination, antibiotics, fungicide)
LS6_13	Veterinary Medicine and infectious diseases in animals
LS7_3	Pharmacology, pharmacogenomics, drug discovery and design, drug therapy
LS7_5	Toxicology
LS7_9	Public health and epidemiology
LS8_7	Animal behaviour
LS8_8	Environmental and marine biology
LS8_9	Environmental toxicology at the population and ecosystem level
LS9_1	Non-medical biotechnology and genetic engineering (transgenic organisms, recombinant proteins, biosensors bioreactors, microbiology)
LS9_2	Synthetic biology, chemical biology and new bio-engineering
LS9_3	Animal science (including animal husbandry, aquaculture, fisheries, animal welfare)
LS9_4	Plant sciences (including crop production, plant breeding, agroecology, soil biology)
LS9_5	Food sciences (including food technology, nutrition)
LS9_6	Forestry and biomass production (including biofuels)
LS9_7	Environmental biotechnology (including bioremediation, biodegradation)
LS9_8	Biomimetic
PE7_10	Robotics
PE8_10	Industrial design (product design, ergonomics, man-machine interfaces, etc.)
PE8_13	Industrial bioengineering
PE8_15	Industrial biofuel production
PE10_3	Climatology and climate change
PE10_4	Terrestrial ecology, land cover change
PE10_9	Biogeochemistry, biogeochemical cycles, environmental chemistry
PE10_12	Sedimentology, soil science, palaeontology, earth evolution
PE10_14	Earth observations from space/remote sensing
PE10_17	Hydrology, water and soil pollution
SH1_1	Macroeconomics; monetary economics; economic growth
SH1_2	International trade; international business; international management; spatial economics
SH1_3	Development economics, health economics, education economics
SH1_4	Financial economics; banking; corporate finance; international finance; accounting; auditing; insurance
SH1_5	Labour and demographic economics; human resource management
SH1_6	Econometrics; operations research
SH1_7	Behavioural economics; experimental economics; neuro-economics
SH1_8	Microeconomics; game theory
SH1_9	Industrial organisation; strategy; entrepreneurship
SH1_10	Management; marketing; organisational behaviour; operations management
SH1_11	Technological change, innovation, research & development



SH1_12	Agricultural economics; energy economics; environmental economics
SH1_13	Public economics; political economics; law and economics
SH1_14	Quantitative economic history; institutional economics; economic systems
SH2_1	Political systems, governance
SH2_2	Democratisation and social movements
SH2_3	Conflict resolution, war
SH2_4	Legal studies, constitutions, human rights, comparative law
SH2_5	International relations, global and transnational governance
SH2_6	Sustainability sciences, environment and resources
SH2_7	Environmental and climate change, societal impact and policy
SH2_8	Energy, transportation and mobility
SH2_9	Urban, regional and rural studies
SH2_10	Land use and regional planning
SH2_11	Human, economic and social geography
SH2_12	GIS, spatial analysis; big data in political, geographical and legal studies

3. Organization of the GEV07

The GEV07 is organized as follows.

Coordinator: Prof. Eugenio Scanziani (VET03, Università di Milano).

Assistant: Elisabetta Feci, PhD.

The GEV07 is structured in the following sub-groups:

- Sub-GEV07 Agricultural Science, coordinated by Prof. Zeno Varanini (AGR13, Università di Verona);
- Sub-GEV07 Veterinary Science, coordinated by Prof. Carlo Guglielmini (VET08, Università di Padova).

3.1 Sub-GEV07 composition

Sub-GEV07 composition is reported in Table 4.

Table 4. Sub-GEV07 composition and the corresponding academic disciplines, coordinators and members.

Sub-GEV and SSD	Coordinator	Components	SSD	Affiliation
Agricultural Science (AGR01 > AGR20)	Varanini Zeno, AGR13, Uni Verona	Thiene Mara	AGR01	Uni Padova
		Viaggi Davide	AGR01	Uni Bologna
		Mastrorilli Marcello	AGR02	CREA SCA Bari
		Poni Stefano	AGR03	Uni Cattolica del Sacro Cuore Piacenza
		Elia Antonio	AGR04	Uni Foggia
		Velasco Riccardo	AGR07	Fondazione E. Mach - S. Michele All'Adige (TN)
		Menesatti Paolo	AGR09	CREA ING Monterotondo (RM)
		Colazza Stefano	AGR11	Uni Palermo
		Kiss Levente	AGR12	Hungarian Academy Of Sciences - Ungheria
		Varanini Zeno	AGR13	Uni Verona
		Nicoli Maria Cristina	AGR15	Uni Udine
		Gobbetti Marco	AGR16	Uni Bari
		Priolo Alessandro	AGR18	Uni Catania
		Gatta Pier Paolo	AGR20	Uni Bologna
Veterinary Science (VET01 > VET10)	Guglielmini Carlo, VET08, Uni Padova	Bonfanti Luca	VET01	Uni Torino
		Scanziani Eugenio	VET03	Uni Milano
		Nicholas Robin	VET05	Consultant - Ex Animal Health and V.L.A – UK
		Bruschi Fabrizio	VET06	Uni Pisa
		Guglielmini Carlo	VET08	Uni Padova
		Pozzi Antonio	VET09	Uni Zurigo



3.2 Assignment of research outputs to the GEV and within the GEV

The GEV07 will receive research outputs on the basis of author's SSD belonging to Area 07. Each research output will be then assigned to the members of the GEV in charge of its evaluation according to its own SSD, as indicated by the author in the research output descriptive form. The GEV07 will divide their research outputs by type of publication and research area and will assign them to the proper Sub-GEV07. The Sub-GEV07 Coordinator will assign them to two competent Sub-GEV07 members. The SSD assigned to the product may differ from the author's SSD, because in the author's opinion the content is more appropriate to another research area; for the same reason, the GEV07 may decide to assign the product to an SSD different from that one chosen by the author; in these cases, the product will be assigned to the GEV of competence for such an SSD and will be submitted to its own evaluation criteria.

If the same research output is assigned to more than one GEV (for instance because co-authors have chosen different SSDs, belonging to different GEVs), the product will be evaluated according to the VQR Guidelines for the Groups of Experts for Evaluation (Sub-section 3.2). If necessary, the Coordinators of the involved GEVs will constitute specific Inter-Area Consensus Groups.

3.2 Operating rules of the GEV07

The operating rules of the GEV07 are listed as follows:

- A GEV07 meeting is convened at least 15 days in advance by the Coordinator, who also draws up the agenda;
- Decisions within the GEV07 are taken by simple majority rule among members attending the meeting. To be eligible for voting, physical presence or web/phone connections are required;
- The assistant assigned by ANVUR to the GEV07 attends the GEV07 meetings, with secretariat functions but without voting rights. At the end of each meeting, he/she will compile both the minutes and a synthetic report, outlining the main decisions taken. The report will be supervised by GEV07 members, approved by the Coordinator and the members, and finally sent to ANVUR to be filed.



4. The evaluation of research outputs

The GEV07 will evaluate research outputs according to the *informed peer review process*, which consists in combining different evaluation methods mutually independent, and in harmonizing them within the GEV07, which ultimately remains responsible for the final evaluation.

The single evaluation methods will be used are:

- Peer review, committed to external reviewers (usually two), selected independently, as a rule, by two different GEV07 members.
- Internal peer review, carried out by the GEV07, according to the same procedure described for external peer review (two GEV07 members will be in charge of independently reviewing the research output).
- Bibliometric analysis, according to the procedure described in Section 6. However, research outputs subjected to bibliometric analysis are not *automatically* assigned to the classes of merit defined by the Ministerial Decree⁴ (hereafter MD) and by the VQR Call. In fact, the allocation will be based on the expert judgment of the GEV07, which will use, together with bibliometric indicators, any other eventual indication, such as the expertise of its members and the information reported in the research output descriptive form.

5. Peer evaluation

Each research output to be evaluated by peer review will be sent to two external reviewers, independently chosen by the two GEV07 members to whom the product was assigned.

Alternatively, a product may be evaluated by the GEV07 according to the same procedure if the necessary expertise is available and if there is no conflict of interest .

⁴ MIUR, Ministerial Decree 27 June 2015



5.1 The selection of external peer reviewers

The selection of external reviewers, among Italian and foreign experts, given its essential goals in the public interest, follows the principle of honest institutional cooperation and is based on the criteria of correctness, objectivity and impartiality.

Great attention will be devoted to maintaining the anonymity of the reviewers, both at the stage of preparation of the list of reviewers and at the operational stage of the evaluation. The results of the evaluation of individual products and the identity of the reviewers in charge will not be made public. A list with the reviewers' names will be published by ANVUR within 30 days after the publication of the VQR Final Report.

Reviewers will be selected among the most authoritative and scientifically qualified experts and specialists in the disciplines relevant to the research outputs to be examined.

Starting from the list provided by ANVUR, the GEV07 will prepare an updated list of external reviewers who can meet the standards set by the GEV07 in terms of scientific quality and experience with evaluation. If necessary, this list will be extended with further reviewers, selected by the GEV07. In particular, through the Sub-GEV07 Coordinators, the Coordinator will invite GEV07 members to suggest a significant number of experts who satisfy the required standards and are available for the evaluation. The GEV07 Coordinator will compile the suggested names with the information about their qualifications, as derived from a specific proposal form prepared by the GEV07, and will provide the list for updating.

It will be possible to extend the reviewers list throughout the evaluation procedure, on the basis of the needs that may emerge after the products are transmitted by institutions.

In order to reduce any potential conflict of interest, the GEV07 will be supported, whenever possible, by reviewers that are active in foreign universities and institutions.

5.2 Peer evaluation

The external or internal reviewers will complete the evaluation form based of the reviewers' guidelines. Both the guidelines and the evaluation form are produced by the GEV07, after embodying, as appropriate, the suggestions coming from the Working Groups on the Evaluation organized by ANVUR that have been active in the months preceding the VQR Call. The evaluation form will allow for the reviewer to assign a single score for each one of the three



evaluation criteria established by the MD and the VQR Call. Such criteria are: originality, methodological rigour, and proven or potential impact. The form will also include an empty field where a concise comment shall be entered, which provides a brief explanation for the final evaluation. The GEV07 will then translate the indications contained in the evaluation form into one of the five classes established by the VQR Call. In case of non-converging evaluations by the reviewers, which only differ by one class of merit, the two GEV07 members in charge of the product will choose which one of the two classes the product will be assigned. When the two evaluations differ by two or more classes of merit, the Sub-GEV07 will create an internal Consensus Group of three components, including the two members who were in charge of the product. The Consensus Group will award a final score for the product under examination, through the *consensus report* methodology. When peer evaluations are strongly diverging (difference of more than two classes), the Consensus Group will request the opinion of a third expert. If the Consensus Group components still do not agree about final evaluation, it the Group will be integrated with the sub-GEV07 Coordinator or the GEV07 Coordinator. In any case, the GEV07 is ultimately responsible for the final evaluation.

6. Bibliometric analysis

The research outputs subjected to bibliometric evaluation are papers published in journals indexed in the citation databases ISI WoS and Scopus, in particular:

- Scientific articles, also in the form of Letters
- Scientific articles in the form of Reviews

Ten percent of articles classified according to the bibliometric algorithm will be also submitted to peer review, in order to verify the degree of agreement between the two evaluation methods.

The selection of articles will be carried out by a stratified random sampling within Sub-GEV07.

6.1 The databases

The GEV will use the databases Web of Science, published by Thomson Reuters (WoS) and Scopus published by Elsevier, based on the indications provided by the author/institution in the research output descriptive form.



6.2 The citation window

The GEV will consider the bibliometric indicators updated at 29 February 2016.

6.3 Self-citations

The inclusion or exclusion of self-citation in the bibliometric evaluation is still debated in the scientific community. The GEV07 decided⁵ not to accept the prior exclusion of self-citations, but to examine carefully those articles presenting more than fifty percent of self-citations. The final classification of such papers will take into account all the information reported by the author in the research output descriptive form and, if necessary, the informed peer review. This will consider the opinion provided by internal or external reviewers.

6.4 Bibliometric indicators

The bibliometric algorithm applied to the products previously described takes into account both the number of citations and the journal metric (JM) of the publishing journal. The weights of the two variables may change from year to year.

In agreement with the international scientific community in the field of bibliometry, and taking into account the different methods used by various metrics to measure impact, the GEV07⁶ will allow the use of several JMs for each database in particular:

- One indicator for the measurement of popularity, where the number of citations received are considered independently from the citing journal
- One indicator for the measurement of prestige, that accounts for both the number of citations received by a journal and the importance or prestige of that journal where such citations come from.

The choice in detail is:

- In WoS (<https://www.webofknowledge.com>): 5-year Impact Factor (5YIF) as an indicator of popularity; Article Influence (AI) as an indicator of prestige; citation window is 5 years.⁷

⁵ Suggestion provided by the bibliometric group constituted in the first meeting of GEV Coordinators.

⁶ Suggestion provided by the bibliometric group

⁷ The 5YIF has been preferred to the Impact Factor (IF) because a) the first one is more stable in subsequent years and b) citation window is the same as the one used for AI (5 years).



- In Scopus (<http://www.journalmetrics.com>): Impact per Publication (IPP) as an indicator of popularity; SCImago Journal Rank (SJR) as an indicator of prestige; the citation window is 3 years.⁸

The author/institution will be requested to indicate the database (WoS or Scopus) and one of the two impact indicators, that he/she/it prefers to be used for the evaluation of his/her/its product.⁹

If not specified by the author/institution, GEV07 will base its evaluation on a default indicator, namely the 5YIF for WoS and IPP for Scopus because these are the most commonly used in Area 07.

6.5 The algorithm for classifying products

The algorithm used for the classification of the articles into the five classes of merit defined in the VQR Call combines the following parameters: a) the bibliometric indicator (JM), which relates to the impact of the journal in which the article was published; b) the citation indicator, measuring the impact of the single paper (CIT). Depending on the year of publication, the first or the second indicator may have a higher relative weight. Each article is evaluated within a specific reference category (more details below), and in the year of publication. The evaluation procedure in the reference category has been previously calibrated in order to ensure that the *ex-ante* probability at world level of each article in a particular category and in a given year of falling into one of the five classes of evaluation, is equal to the one defined by the VQR Call:

- Excellent [within the top 10% of international scientific research output in its field];
- Good [within the 10% and 30% of international scientific research output in its field];
- Fair [within the 30% and 50% of international scientific research output in its field];
- Acceptable [within the 50% and 80% of international scientific research output in its field];
- Limited [within the 80% and 100% of international scientific research output in its field].

⁸ IPP is defined in the same way than 5YIF, although the citation window is not the same. SJR definition is very similar to AI definition.

⁹ In WoS, recently issued scholarly journals could not have 5YIF and AI associated with them. In this case, IF will be used. If either IPP or SJR were not available in Scopus for a specific journal, the available indicator between the two will be used.



The percentiles indicated for the classes of merit are not the expected percentage results in terms of products submitted to the VQR process. In fact, individual products will be assessed independently from each other, by properly assignment to a class of merit, regardless of the allocation of the other products.

The first action to take in the evaluation of a given article is the identification of the reference category known as *Subject Category* (SC) in WoS and *All Science Journal Classification* (ASJC) in Scopus (from now on, both of them are SC). If a journal is included into more than one SC, the author/institution who submits the product shall indicate the preferred SC for the evaluation to be performed in. However, if the content of the article appears more relevant to another SC where the publishing journal belongs, the GEV07 may decide to modify the SC assignment.

A multidisciplinary category is present both in WoS (*Multidisciplinary Sciences*) and in Scopus (*Multidisciplinary*) and includes journals such as Nature, Science, etc., characterized by a plurality of scientific disciplines. If an article has been published in a journal included exclusively in this category, it will be reassigned to another SC on the basis of (i) the number of citations contained in the article and (ii) the number of citations received by the article. In particular, every cited/citing journal, will be associated with one or more relevant SC and the final SC will then be chosen according to a majority rule. Consequently, the manuscript will be compared with publications within the same subject area and/or discipline. The article will bring the JM of its publishing journal and the citations received in the assigned SC, without changing its internal products distribution. The same procedure will be followed for the journals included exclusively in other multidisciplinary subject categories of WoS and Scopus (for instance, the ASJCs 1100 - Agricultural and Biological Sciences (all) and 1101 - Agricultural and Biological Sciences (miscellaneous) in Scopus). As already mentioned, the allocation of the research outputs into one of the five classes is performed after a previous calibration of the thresholds in the SC identified and in the specific year. This procedure allows for the research outputs to be distributed with the same percentages within the five classes, whatever the SC or the year analysed.

6.6 Calibration procedure

The bibliometric algorithm is calibrated in function of the SC and the year analysed. The algorithm also discriminates between *journal article*¹⁰ with *letters* and *review* and computes

¹⁰ Articles typology include *Conference papers* published in journals.



separated empirical cumulative distributions; in fact, different types of publications usually receive a different number of citations.

The algorithm calculates the empirical cumulative distribution of the JM associated with the scholarly journals belonging to a particular SC and for the year of publication of the article under evaluation; finally, a percentile is assigned to every journal. The empirical cumulative distribution of the number of citations (CIT) received by the articles published in the whole SC is then calculated and a percentile is assigned to each paper. Each item will therefore be associated with two percentiles: the JM percentile and the CIT percentile. The two variables detect a point in the $Q = [0,1] \times [0,1]$ region of the Cartesian plane, defined by the JM percentile (X-axis) and the CIT percentile (Y axis). Then Q is divided into five zones or regions in such a way that they comply with the percentage of items belonging to each class of merit defined in the VQR Call (par 6.5).

The region is divided by lines defined as follows:

$$CIT = A \cdot JM + B_n$$

The angular coefficient (A) of the lines dividing the areas is imposed to be the same for all classes in order to enhance the homogeneity of the applied criterion (Figure 1).

The intercepts B_n are calculated by ANVUR in order to respect the percentage distribution of item on each class of merit.

The conversion in percentile distribution of articles within a SC for a particular year allows for an evaluation of products calibrated to their reference set.

The slope A of the threshold lines is set by each GEV. It has a crucial role, as it can alter the final classification in favour of either the CIT (when absolute value of A is less than 1) or the JM (when absolute value of A is higher than 1).

For example, a horizontal line ($A=0$) corresponds to an evaluation based exclusively on the citations. The use of very steep lines should be avoided when bibliometry is applied for evaluation purposes,¹¹ because it is impossible to rely exclusively upon the impact indicator of the publishing journal as a proxy of the impact of a single article.

¹¹ See the *San Francisco Declaration on Research Assessment (DORA)* - <http://www.ascb.org/dora/> - and IEEE Statement on Appropriate use of Bibliometric Indicators

In other words, absolute values of A less than 1 should be preferred, so that the information provided at the single product level (*article level metric*) by CIT, is retained. However, this rule is not absolute, because many features, such as the citation tradition of the GEV, number and composition of the SC, year of publication, affect the reliability of information provided by the number of citations.

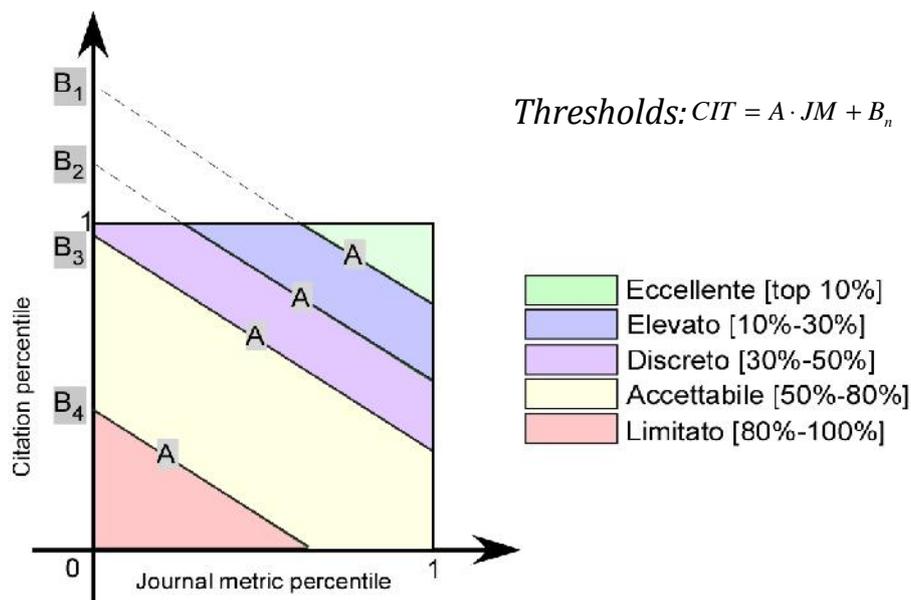


Figure 1. Graphic representation of the percentile distribution of all the articles published in a particular SC for a given year. Each publication is described in the plane according to the publishing JM percentile (x-axis) and the percentile of citations number (y-axis). The plane is divided into five areas, each of them containing the percentiles shown on the VQR. The angular coefficient A of the threshold lines is the same for all the classes. The intercepts values will be calculated by GEV in order to make sure that the percentile distribution is respected.

On the basis of many simulations performed by the Bibliometric Group, GEV 07 has considered the citations to be sufficiently stable since 2013, therefore it decided to adopt the following slopes:

- 2011: -0,7
- 2012: -0,9
- 2013: -1,5

- 2014: -2,0

Such values may vary within a range of $\pm 30\%$ in the years 2011, 2012, 2013 in order to avoid misclassifications (for example, classify as *excellent* a paper that has received 0 citations). In 2014, when citation data are less stable, slope will vary between $[-2,0; -1,0]$.

As an example, in Figure 2 a calibration of a SC through the application of four parallel straight lines is reported, having an angular coefficient of -0.6 which takes into account citations in the final evaluation. As it is shown, the points representing articles included in the whole SC are not homogeneously distributed. By properly selecting the value of intercepts it is possible to ensure that the percentages described in the VQR Call are respected, with an accuracy higher than $.0\%$. This means that when the algorithm is applied to the “world” production of articles within a SC, the percentage partition described in the VQR Call is obtained. As a consequence, the evaluation of the submitted article is always referred to the “international scientific production of the belonging area”.

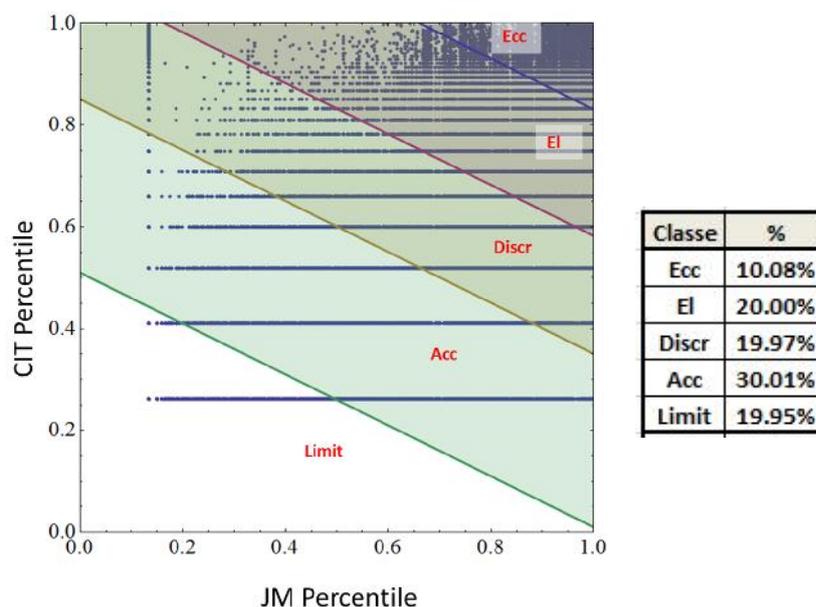


Figure 2. Example of application of bibliometric algorithm to a sample SC. The partitioning of the sub-space Q through parallel lines allows for respecting the percentages defined in the VQR Call, when the algorithm is applied to the world article population in a specific SC.



Once the calibration procedure has been performed, the assignment of a product is as follows: the percentiles of the JM for the journal in which the article was published and the percentiles of citations received by the article in the year of publication are calculated. The point corresponding to the article is then placed in the abovementioned space. Depending on the area under which the point falls, the evaluation of the product according to the bibliometric algorithm is accomplished.

Sometimes, articles are published in prestigious journals but receive few citations (bottom right area in Figure 2), sometimes articles published in journals with low value of JM have a high citation impact (upper left area in Figure 2). In such cases of uncertainty, evaluation will be carried on through the *informed peer review*; this process includes an evaluation phase, internal or external to the GEV07, depending on the expertise required by the product. To identify such products, it is sufficient to track two additional straight lines, with positive slope, which define the areas at the top left and bottom right of Q (see Figure 3). Consistently with the other Groups of Experts who make use of bibliometric evaluation, in GEV07 the two uncertainty areas will have the shape of a right-angled triangle: in the top left triangle, the right sides corresponds to the left and the upper side of the Q space, and the third side is the straight segment connecting the point (0, 0.5) with the intersection between the threshold line of class Excellent and the upper side of Q space (Figure 3). The triangle in the bottom right corner of Q is an isosceles right triangle which detects 5% of products in the years 2011 and 2012 and 7% of products in 2013.

As in 2014 the number of citations is not relevant, GEV07 established that only papers receiving a bibliometric classification of Excellent will be evaluated through bibliometric algorithm, while the other products will be addressed to the *informed peer review*.

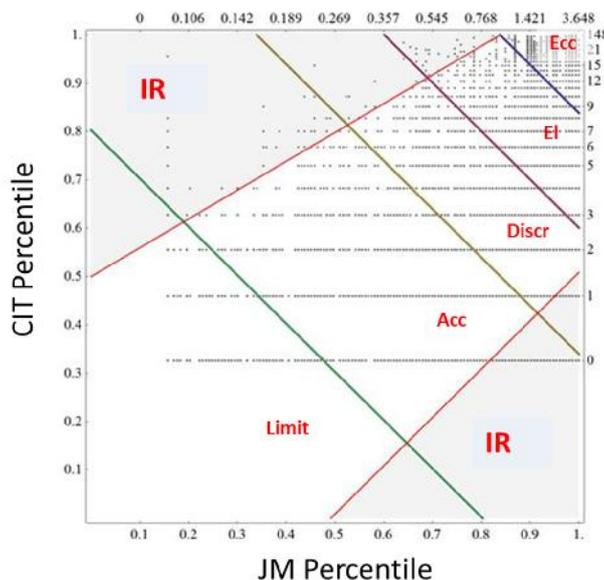


Figure 3. Example of definition of uncertainty areas committed to *informed peer review* (IR).

7. Research outputs

All the research outputs eligible for evaluation are listed in Table 6 and the range of classes of merit they can access is also shown.

GEV07 is aware that the selection of types of products and the class limitations attributed to some of them represent not only an evaluation criterion for research outputs issued between 2011 and 2014, but also a suggestion to address the forthcoming scientific production for next generation scientists.

Scientific articles published in journals not indexed by WoS and / or Scopus cannot qualify for classes Good and Excellent. The reason for this exclusion is that for these kind of journals the existence of a peer review process is uncertain. Conference proceedings are not considered to have the same value as a real scientific article, which, in contrast, shows complete results and is often anticipated by preliminary data reported in conferences. Data bases, software and thematic maps do not undergo to a standard peer review. Finally, international patents are considered more relevant than national patents.

Table 6 - Research outputs admitted to evaluation

Product	Range
Research monograph	Limited- Excellent
Scientific article in journal with peer review and indexed in WoS/Scopus	Limited-Excellent
Scientific article in not indexed journal	Limited-Fair
Review in journals with peer review	Limited-Excellent
Letter in journals with peer review	Limited-Excellent
Contribution in a book (Chapter or essay)	Limited-Good
Scientific article in conference proceedings subjected to <i>peer review</i>	Limited-Fair
Database and software	Limited-Good
Thematic map	Limited-Good
National patent	Limited-Good
International or foreign patent	Limited-Excellent

Products not eligible for evaluation by GEV07 are:

- Handbook and manuscripts for teaching purpose
- Conference Abstracts
- Conference proceedings not subjected to peer review
- All types of products listed in the VQR Call and not cited in Table 6.

Types of research outputs different from the bibliographic ones (data bases, software, thematic maps, and patents) will be evaluated through the peer review process.

8. Conflict of interest

GEV07 members will abstain from evaluating or assigning to other GEV07 members and external reviewers:

- Products they have authored or co-authored;



- Products that have been authored by spouses and relatives up to the 4th grade of kinship;
- Products submitted by Universities of which members themselves are, or have been, employees or from which they have received official assignments, including affiliation, over the years since 1/1/2011;
- Products submitted by research institutions supervised by the Ministry of Education, University and Research (MIUR) and other public and private bodies who volunteered for the VQR, of which members themselves are, or have been, employees or from which they have received official assignments, including affiliation, over the years since 1/1/2011.

With respect to the internal organization of research entities, the conflict of interest may arise at the following levels:

- When the institution in question has a permanent internal division along a territorial or disciplinary dimension (e.g., a local section of a research centre, institute, department), a conflict of interest exists only with respect to the products presented by the same internal unit;
- when the institution in question does not have a permanent internal division along a territorial or disciplinary dimension (e.g., a local section of a research centre, institute, department), a conflict of interest exists with respect to all the products presented by the institution;
- when the internal organization is based on several hierarchical levels (e.g., several institutes within a single department), a conflict of interest arises at the lowest level (e.g., GEV07 members who are affiliated with different institutes belonging to the same department, have a conflict of interest only with respect to the products presented by authors belonging to the same institute).

In case of conflicts of interest, the GEV07 Coordinator will assign the product to another GEV07 member who has no conflict of interest.

In case of conflicts of interest involving the GEV07 Coordinator, the corresponding products will be assigned by the VQR Coordinator or by a person designated by the VQR Coordinator.

National Agency for the Evaluation of
Universities and Research Institutes



Agenzia Nazionale di Valutazione del
sistema Universitario e della Ricerca

Evaluation of Research Quality



Valutazione Qualità della Ricerca

In addition to the general rules about conflict of interest defined by the VQR and ANVUR, GEV07 may insert some rules pertaining its own scientific area.