

Call for Proposals

Alberto Giovannini Programme for Data Science 2022

1 Introduction

As part of the Alberto Giovannini Programme for Data Science, the European Systemic Risk Board (ESRB) in cooperation with the European Central Bank (ECB) is looking for leading scientists, policy experts and researchers in data science, data analytics, financial engineering and finance. We plan to launch up to four projects to conduct high-level research and design and implement cutting edge data analytics tools to explore and analyse the wealth of information available to the ESRB through several large datasets. These include granular level data on derivatives from EMIR.¹ The data are extensive; for example, the full ESRB derivatives dataset contains approximately 170 billion observations. The projects will be designed to develop innovative analytical tools and new insights in relation to one or more of the following topics:

No.	Topic
1	Improve the understanding of the structure and functioning of derivatives markets and assess their impact on monetary conditions.
2	Further develop the ESRB's capabilities to monitor EU financial markets, with a focus on financial stability and systemic risk.
3	Extract novel insights to inform the development of macroprudential and/or monetary policies.
4	Investigate and analyse the market turmoil during and immediately after the outbreak of the COVID-19 pandemic.

2 Scope of the assignment

Contracts will have a duration of approximately 20 months depending on the project². Successful candidates will provide a set of deliverables to the ESRB/ECB by means of a high-quality project addressing one or more of the key topics outlined in Article 1. For the sake of clarification, "candidate"

¹ See the [European Market Infrastructure Regulation](#), the Official Journal of the European Union and [Transparency of Securities Financing Transactions and of Reuse](#).

² Circumstances permitting, see Article 5.1.

refers to the project leader responsible for submission of the proposal and overall management and administration of the team.

2.1 Milestones and deliverables

Successful candidates will provide the following deliverables, which should be included in the timeline for the project proposal submitted:

Deliverable	Format
Insights and results of the analytic investigation, highlighting its policy relevance	Report; working paper (if agreed)
Analytical tool	Code and documentation
Illustration of the results and use of the tool	Internal seminar/workshop organised by the host Business Area

The main aim is: i) to build novel and innovative analytical tools that the ESRB and ECB can add to their analytical and monitoring toolkit; ii) to gain insights that enhance the understanding of the financial system and inform the development of policies. If agreed, the final deliverables may also include an ESRB or ECB working paper to be submitted to a peer-reviewed academic journal.

Successful candidates and team members must:

- sign the EMIR data confidentiality undertaking (Annex 8 to the draft contract) and adhere to ESRB/ECB best practices in terms of data handling and confidentiality;
- attend an induction session once the contract has been signed to become familiarised with best practices on data handling, coding and administrative processes. This may be organised remotely;
- participate in periodic progress assessments with the host Business Area to discuss the above deliverables six, 12 and 18 months after the start of the project. This may be organised remotely.

2.2 Working arrangements

Successful candidates will work from their own office. However, to access the data they are required to work from the ECB premises in Frankfurt am Main. Please refer to Annex 5 of the draft contract for details concerning the reimbursement of expenses during on-site visits. Candidates must include a description of their working arrangements in the project proposal. The working language is English.

2.3 Technical aspects

Candidates must clearly define a schedule of visits to the ECB and work from their own office in a project timeline, to be agreed with the host Business Area during the planning phase if they are successful. This is of fundamental importance to ensure that the technical needs for working on-site at the ECB are met.

Candidates are strongly encouraged to consult the [EMIR Regulatory Technical Standards](#), and the [EMIR Implementing Technical Standards](#) for an overview of the data, its format and variables when designing their projects. The EMIR dataset contains daily reports going back to 2 January 2018. The EMIR TR reports are enriched by the ECB and the ESRB (e.g. foreign currency amounts are converted into EUR, sectoral identifiers are provided for counterparties, information on counterparties is available from the Global Legal Entity Identifier Foundation (GLEIF), there is information on the underlying and data quality checks are carried out).

Whilst on-site, successful candidates will be provided with an ECB computer with the following data access as well as statistical, data processing and text editing software, as required:

- EMIR TR data and the ECB statistical warehouse. Data is processed and stored in Hadoop;
- Statistical and data-processing software: Apache Impala/Hive, R, Python, MATLAB, Stata, Git.

The use of other software and/or data sources cannot be guaranteed and any other requirements other than those listed above must be specified and clearly flagged in the project proposal. Failure to do so may impact the assessment of the project. In particular, please note that it will not be possible to provide the following:

- access to supervisory data (e.g. bank balance sheet data or securities holdings);
- individual Bloomberg or other data source licences for large-scale downloads of market data.

Code produced at a successful candidate's office and/or data may be transferred to ECB computers, subject to respecting all applicable licence agreements, but the following points are of paramount importance:

- ECB/ESRB data and/or any other confidential information must not leave the ECB IT systems or premises in any format under any circumstances.
- data and/or any other confidential information must not be transferred or sent from an ECB computer or device to any other non-ECB device or non-ECB email address.

3 Qualifications and experience

Candidates may nominate a team of up to five additional members to support the project. The team may be composed of experienced data scientists, policy or academic experts, professors, research assistants, PhD students or experienced professionals. The team must combine a high level of expertise in one or more of these areas: data science, statistics, mathematical, financial, economic or econometric modelling, financial engineering. They must also have extensive practical experience in the handling and analysis of big data. Ideally, the team should also possess a high level of understanding of derivatives markets, macroprudential policy, financial stability and the systemic risk implications of derivatives markets.

Please note:

- Candidates must nominate and disclose all team members in the application process. The engagement of research assistants at a later stage is explicitly prohibited. It will not be possible to integrate new project team members once the proposal and nominated team have been selected.
- While close collaboration between the teams selected and ESRB/ECB staff is encouraged to ensure valuable knowledge transfer, ESRB/ECB staff are not permitted to participate in this call for proposals. Candidates who nominate ESRB/ECB staff members as team members will be excluded.

3.1 Academic background

Candidates and all team members must hold at least a master's degree in a relevant discipline for the proposed project (computer science, data science, data analytics, financial engineering, physics, statistics, mathematics, engineering, econometrics, finance, economics or equivalent).

3.2 Experience

At least one team member must:

- have a minimum of three years of proven experience in developing code for data analysis projects and handling statistical software (R, Matlab, Python, SQL, Scala or other);
- have successfully and demonstrably completed at least one project using granular and large-scale datasets;
- have a minimum of two years of proven experience in conducting policy-oriented research.

It would be an advantage if candidates, or at least one team member, possess proven practical experience of more than one year in one or more of the following fields:

- derivatives, clearing, settlement;

- central clearing, derivatives pricing, risk management;
- a supervisory or oversight role related to derivatives;
- quantitative risk management, financial engineering;
- machine learning applications using financial data.

3.3 Conflict of interest

All members of the team must disclose any potential conflict of interest and are required to confirm that they do not have any financial or commercial interest in the data.

4 Preparation and submission of proposals

Project proposals providing the deliverables mentioned in Article 2.1 must be submitted in English and include the information and documentation described below in pdf format. Candidates must also include any additional information deemed necessary to provide the services requested, even if this is not explicitly indicated in this Call for Proposal.

- 1) A detailed project plan (maximum five pages) containing the following:

Part 1	An overview describing the project leader and nominated team members and their roles and responsibilities. Please indicate who will perform the on-site data analysis and development.
Part 2	A description of the project, including the analytical tool(s) it will develop. This should also give the technical details of the analytical tool (e.g. data requirements, functionalities) and be consistent with the technical aspects in Article 2.3 of this document. Any deviation or special requirements should be clearly highlighted. Omission of such information may impact the assessment of your proposal.
Part 3	A description of the insights the analytical tool will produce and how this will be achieved by the tool. The description should highlight the policy relevance of the project with respect to the core mandates of the ESRB and/or ECB. ³
Part 4	A summary of how the proposed analytical tool relates to the existing literature and methodologies.
Part 5	A project timeline including deliverables (see Article 2.1), task allocations within the team and scheduled off and on-site visits.
Part 6	Any additional information deemed necessary to provide the services requested.

³ For further information on the core mandates see www.esrb.europa.eu and www.ecb.europa.eu

- 2) CVs for the project leader and each team member demonstrating experience, qualifications and expertise relevant to the assignment (see Article 3), including previous data-related projects, software and codes developed, research reports or published articles (maximum 3 pages per CV). The ESRB/ECB may request copies of diplomas, certificates, reference letters, names of referees, etc. for verification. These must be submitted within 10 days.
- 3) The application form (Annex 1), duly signed and completed by the candidate and each team member.

Candidates must submit proposals no later than **Tuesday, 31 May 2022, 23:59 CET** to the following email address: EMIR-AG@esrb.europa.eu with the subject line:

Proposal for the Alberto Giovannini Programme for Data Science 2022-2023

Proposals dispatched or received after the deadline will not be considered. Enquiries may be sent to the following email address: EMIR-AG@esrb.europa.eu.

4.1 Contract

The contractual relationship will be based on the attached draft contract (Annex 2). By submitting a proposal, candidates accept the terms and conditions of this contract.

Candidates are not allowed to propose changes or additions to the ECB's draft contract. Only minor changes or additions aimed at clarification will be accepted. Candidates who intend to propose such changes or additions must: (i) indicate in their proposal the article they would like to change or expand; (ii) provide an alternative proposal; (iii) explain their proposal. The ECB reserves the right to exclude candidates proposing substantial changes to the draft contract that affect the allocation of risks between the parties. The ECB also reserves the right to ignore changes or additions proposed at a later stage.

5 Evaluation of proposals

The ESRB/ECB will exclude proposals that:

- (a) are received after the deadline;
- (b) are substantially incomplete;
- (c) are not submitted in English;
- (d) nominate ESRB/ECB staff as team members;
- (e) contain undisclosed team members (e.g. research assistants to be hired later).

The proposal will be evaluated based on the documentation submitted for the specific topic as described in Article 4 and weighted according to the following two-step process.

Step 1

<p>1. Quality of the detailed project plan. The relevant sub-criteria are:</p> <ul style="list-style-type: none"> a. Innovative character of the analytical tools proposed. b. Relevance to policy questions and analyses. c. Plausibility of completing the agenda envisaged within the proposed timeframe given the team's composition and expertise. 	<p>40%</p> <p>20%</p> <p>20%</p>	<p>80%</p>
<p>2. CVs of the candidate and all team members demonstrating experience, qualification and expertise relevant to the assignment.</p>		<p>20%</p>

The best projects will be invited to Step 2.

Step 2

<p>1. Written assignment (related to data analysis).</p>		<p>25%</p>
<p>2. The project's overall score under Step 1.</p>		<p>50%</p>
<p>3. A group interview by video with all members to assess the team's qualification to complete the project proposed within the timeline proposed.</p>		<p>25%</p>

5.1 Contract award

The ESRB/ECB plan to launch up to four projects for 2022-2023. The proposals carrying the four highest scores will be placed on a short-list. Contracts will be awarded to candidates starting from the highest score downwards.

Candidates will be informed in writing of the outcome of the procurement procedure within a reasonable time. The ESRB/ECB reserve the right to postpone or cancel the programme.

6 Annexes

Annex 1 Application form (to be completed by the project leader and each team member)

Annex 2 Draft contract with annexes