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Writing a solid quantitative paper

Basic guidelines

Jesús Peiró-Palomino

Associate Professor, University of Valencia
Editor, Regional Studies, Regional Science

Contact: jesus.peiro@uv.es

1. Start with a question, not with a dataset

THE RESEARCH LOGIC

Research question

Specific, important and answerable. What do we not yet know?

Contribution

Explain what is new relative to the closest literature—not just what is different.

Evidence & design

Show why these data and methods can answer this question.

Before running a model, be able to answer:

- **Why does this question matter for regional science and for readers beyond the study area?**
- **What can readers learn that they cannot from existing studies?**

2. Data quality is part of the contribution

Sources & provenance

- Reliable primary or secondary sources
- Clear collection procedures
- Coverage, definitions and time span
- Permissions, privacy and ethics

Measurement & limitations

- Define every key variable
- Explain proxies and assumptions
- Address missingness, outliers and comparability
- Discuss selection and measurement error

New data opportunities

- Administrative, satellite, web or text data
- Carefully designed surveys and fieldwork
- Big data can reveal phenomena not previously measured
- Validate new measures against credible benchmarks

A growing opportunity: create data that do not yet exist

- **Original datasets can be a major contribution if the construction process is documented and validated**
- **Big data are not automatically good data: scale does not guarantee representativeness, accuracy or relevance**

3. Describe your data before explaining them

Descriptive analysis is not a formality. It is the first test of the research design

- **Sample size, number of observations and period**
- **Summary statistics and variable definitions**
- **Distributions, outliers and missing values**
- **Correlations and preliminary patterns**
- **Maps, trends and differences across groups**

Why it matters

Readers need to understand what the data look like before being asked to trust the model.

What it can reveal

Unexpected patterns, data errors, heterogeneity and whether the proposed method is appropriate.

A useful rule

Every table and figure should answer a question and not simply fill space.

4. Regional science must be spatial in its reasoning

Place matters

Why should location, borders, distance or territorial context shape the question or mechanism?

Space matters

Consider spatial dependence, spillovers, networks, neighbouring regions and cross-border effects.

Scale matters

Justify the territorial unit and address aggregation and within-region heterogeneity where relevant.

Ask yourself:

- **Would the argument change if the observations were not geographically located?**
- **Could results be driven by spatial clustering, spillovers or regional context?**
- **Are maps and spatial methods used because they are needed and not just because they are available?**

5. Choose methods to fit the question

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Econometrics

Useful for theory-driven estimation, uncertainty, inference and causal designs when assumptions are credible.

Machine learning

Useful for prediction, high-dimensional data, text and nonlinear patterns. Evaluate out-of-sample performance.

Combine thoughtfully

Methods can complement each other. Explain the role of each model and why it adds value.

What a good analysis should make explicit:

- **Identification: correlation is not causality**
- **Robustness: alternative measures, specifications, samples and relevant sensitivity tests**
- **Interpretation: effect sizes, practical meaning and political implications**

6. Make the research transparent and reusable

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Report transparently

Explain data cleaning, variable construction, exclusions, model choices and software/packages.

Share what you can

Deposit code, documentation and data in a trusted open repository when possible.

Enable replication

Provide a clear workflow, versioned files, readme and instructions to reproduce tables and figures.

Before submission. A short quality checklist:

- **Is the research question and contribution clear from the introduction?**
- **Can readers assess the quality, limitations and regional relevance of the data?**
- **Are the methods justified, the results interpreted carefully and the findings robust?**
- **Could another researcher understand and, where possible, reproduce the analysis?**

Jesús Peiró-Palomino (University of Valencia)

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A relevant question → trustworthy data → transparent description → appropriate methods → spatial insight → robust, reproducible findings

Be original

Contribute a new idea, measure, dataset or explanation.

Be rigorous

Make every analytical choice defensible.

Be transparent

Help readers evaluate and reuse your work.

Thank you

jesus.peiro@uv.es

Jesús Peiró-Palomino (University of Valencia)