

Do Journals Still Matter in an Era of Online Academic Search?

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Background

- Journals have traditionally served the role of gatekeeper for research publications, marking the quality of papers and offering an organizing filter for search. In the era of preprint archives and academic search engines, are journals still relevant in this role?
- The question is difficult to study empirically because of the deeply confounded relationship between paper impact and journal reputation.
- We present a measure of individual paper quality that is divorced from journal reputation: the number of citations to preprints posted on arXiv.org, prior to journal publication.

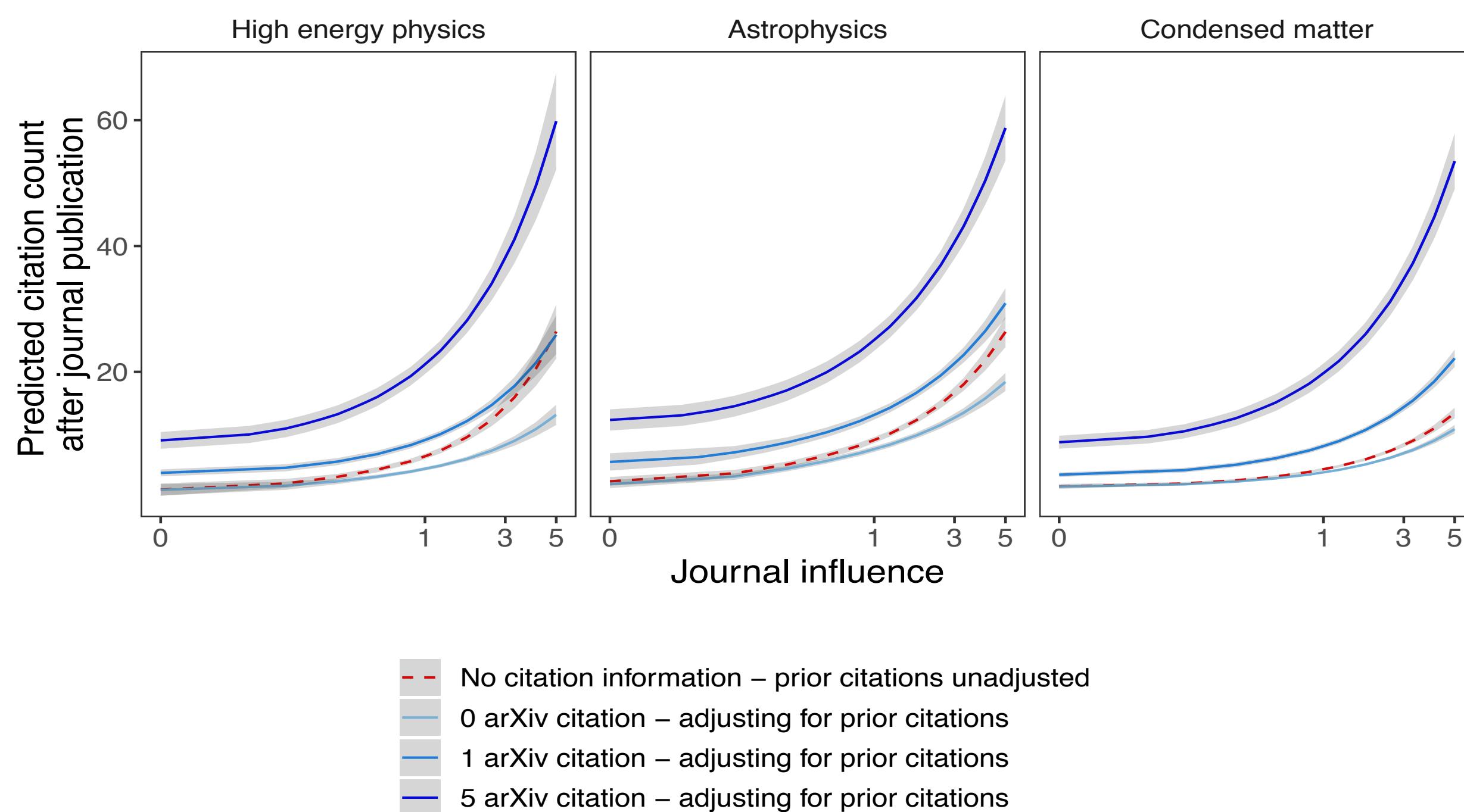


Figure 2: Does journal status have an effect after controlling for individual paper quality?

Predictions of post-publication citations received for papers in the three fields using a model naïve to preprint citations (dashed red lines) vs. a model controlling for preprint citations (solid blue lines). The models are zero-inflated regression models with a negative binomial distribution. **Journal status still has an effect after controlling for preprint citation count**, but the controlled models perform better, suggesting that the journal effect has been inflated.

Results

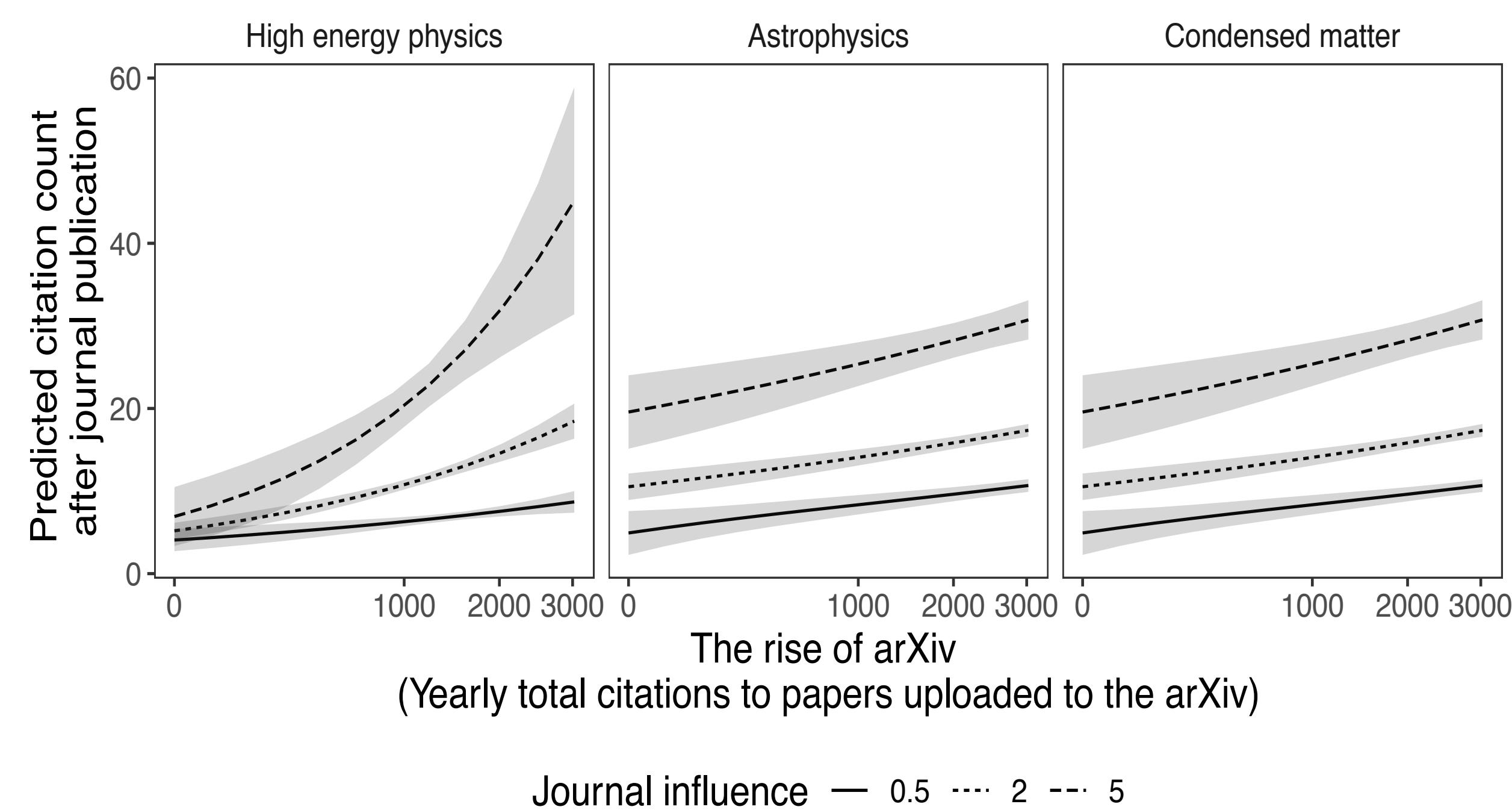


Figure 3: Is there a temporal trend for journal effect?

Predictions of post-publication citation counts in the three fields as a function of the rise of arXiv in each field, adjusting for preprint citations received. Lines show predictions for different levels of journal influence; the gap between lines at a given point on the x-axis is indicative of the effect of journal status at a given point in time. **We see no consistent change in journal influence as arXiv use increases over time.**

Data

- Papers uploaded to the arXiv between 1998 and 2003 in the fields:
 - High energy physics phenomenology (Hep-ph): 31,623 papers
 - Astrophysics: 42,063 papers
 - Condensed matter: 84,326 papers
- Microsoft Academic Graph
 - Contains citation and publication information for scholarly articles available on the web
 - Linked to the arXiv papers using DOI (Document Object Identifier) and title
 - We considered citations to the preprint as an independent measure of paper quality.

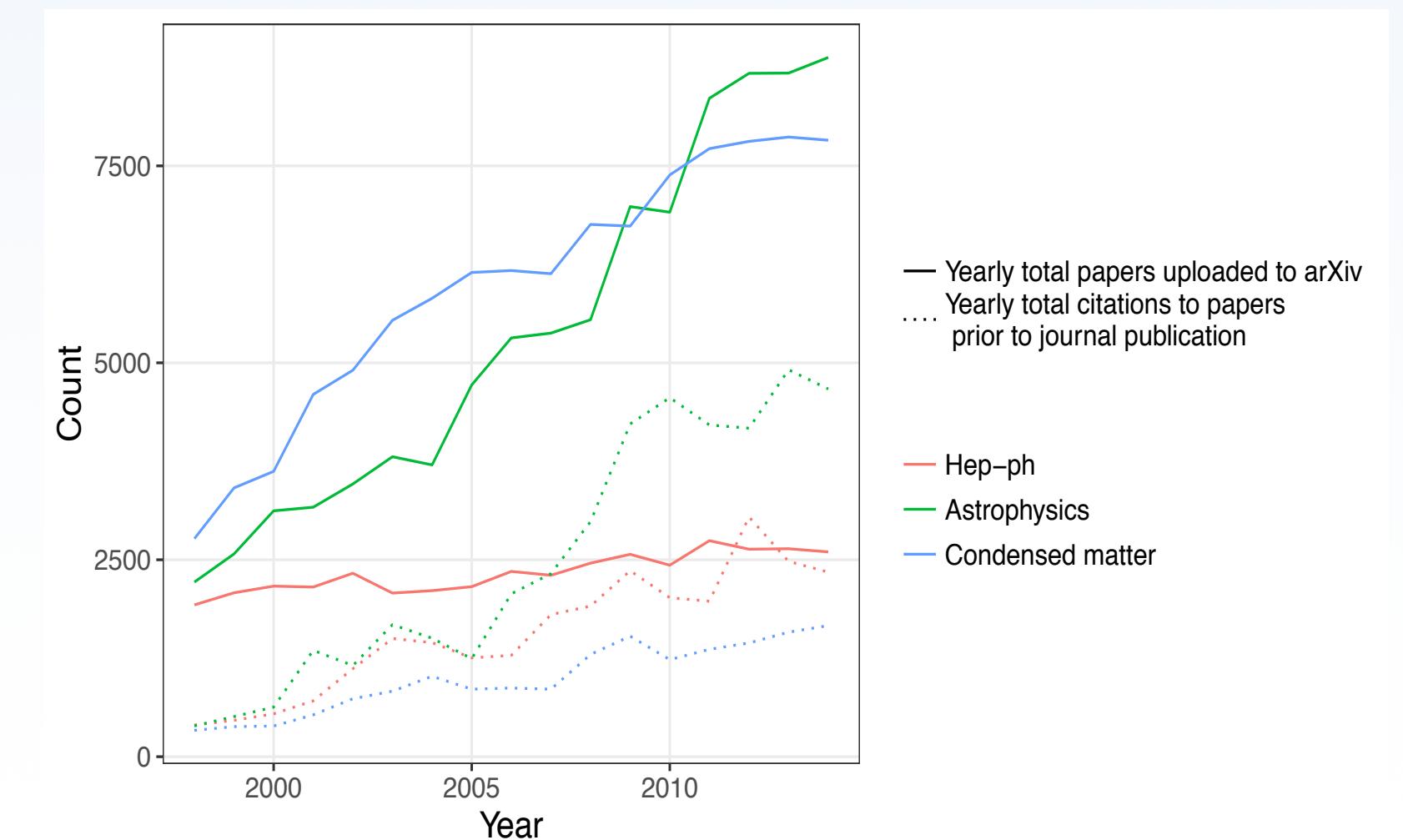


Figure 1: The rise of arXiv.

Yearly total papers uploaded to arXiv (solid lines) and yearly total citations made to arXiv papers prior to journal publication (dotted lines) between 1998 and 2014.

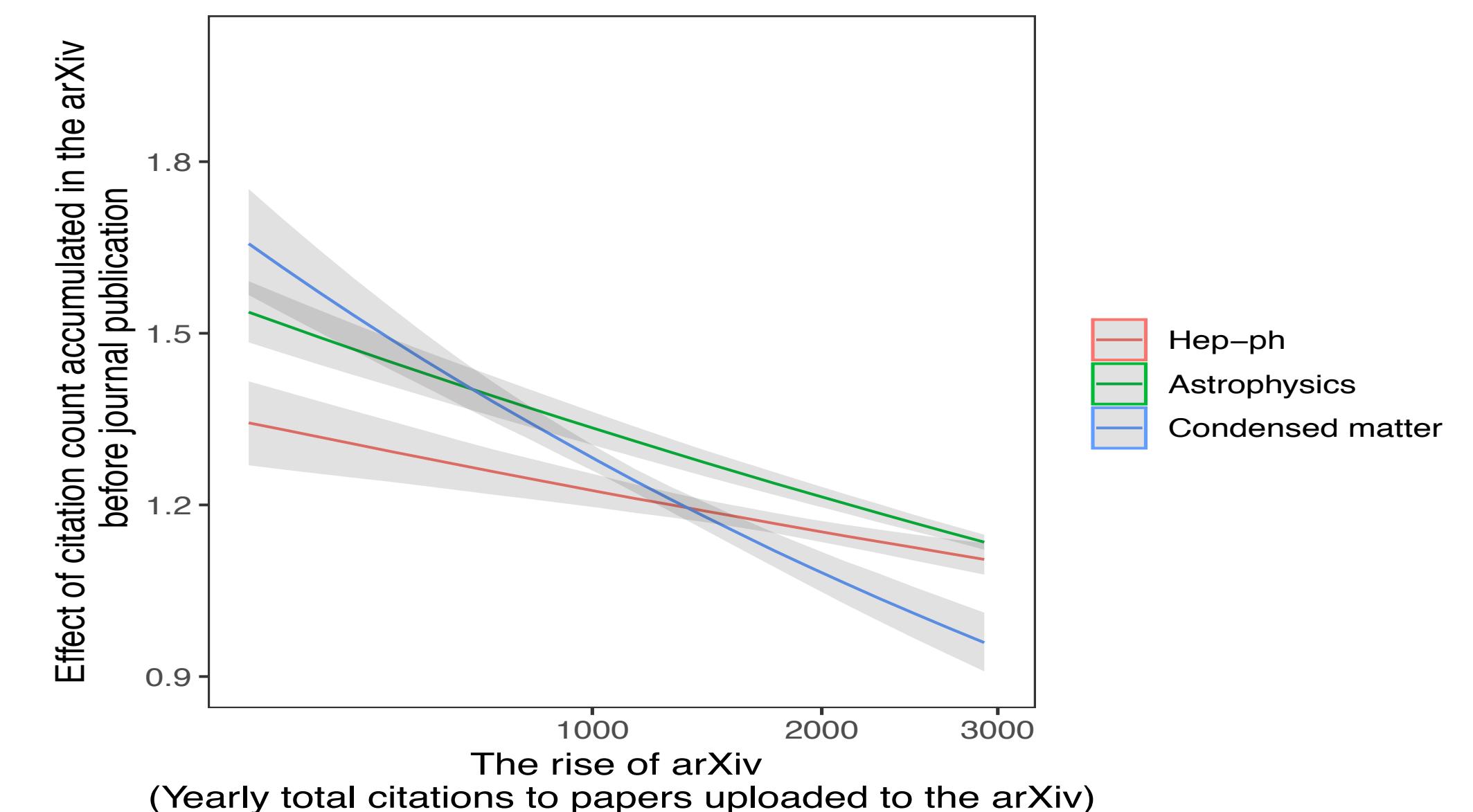


Figure 4: High quality preprints are now less likely to be published in a journal at all.

Effect of preprint citation accumulation on publication in a journal, measured using a Cox proportional hazard model, for the three disciplines, as a function of the rise of arXiv in each field.