Comments are welcome*

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Abstract

Scholars present their new research projects at seminars and conferences, and send drafts to peers, hoping to receive comments and suggestions that will improve the quality of their work. Using a dataset of economics papers, this article measures how much peers' individual and collective comments improve the quality of research projects. Controlling for the initial quality of the idea and authors' skills, I find that a standard deviation increase in the quality-weighted number of peers' individual and collective comments increase between 44% and 53% the quality of the journal in which the research is published.

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Keywords: production of science, peers' comments and suggestions, research seminars, economics.

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1 Introduction

Scientific progress is fueled by new ideas. During the process of transforming new ideas into research outputs scholars rely on their peers to identify weaknesses in their work, and find alternative models, methodologies and databases that can improve the quality of their research. Considering the time scholars devote to present draft versions of their ideas at conferences, research seminars or one-to-one meetings, it is reasonable to expect that peers' comments and suggestions should improve gently the quality of new research projects. However, despite its alleged importance, no study has quantified this contribution yet.

If the individual and collective comments received by a paper were random, we could use the variation in the number of comments across papers to identify peers' contribution to the quality of a research project. However, individual and collective comments are correlated with two variables that also influence the quality of a research project: the quality of the author and the quality of the research idea. First, Minondo (2019) shows that high quality scholars are more likely to be invited to present their work at a research seminar. It also reasonable to expect that high-quality authors' papers are more likely to be accepted at high-quality conferences. Furthermore, high-quality scholars may also receive more comments from other authors because they have more opportunities to interact with other scholars at seminars and conferences, or because their work is more likely to be followed by other scholars. Second, it seems reasonable to expect that scholars will choose their most promising projects when deciding what paper they will present at a research seminar and what draft they will send to a colleague. Therefore, not controlling for the quality of the author and the quality of the idea may bias the estimations of the contribution of peers' individual and collective comments' to the improvement of a research project.

The quality of a scholar can be proxied by the quality of the university she is affiliated, or the citations to her previous work. However, it is not easy to find a measure for the quality of a research idea. This paper uses a feature of the job placement process of PhD candidates in economics to identify the initial quality of a research project. During their last academic year, future PhD graduates in economics select a project, among their contemporaneous research ideas, as their job market paper. This paper is the tool PhD candidates use to show their research skills to potential employers. Since PhD candidates want to maximize job offers, they select as job market paper their highest quality project. Thus, the job market paper status provides a signal for the initial quality of a research project.

I build a sample of 1834 PhD candidates in economics from the top 40 US economics departments that entered the labor market between 2000 and 2018. When a PhD candi-

date enters the job market, I identify her job market paper and the additional projects she could also have selected as her job market paper. I follow the job market paper and the additional projects until they are published. At that moment, based on the acknowledgment section of the article, I compute the number of research seminars, conferences and workshops in which the paper was presented, and the scholars that provided comments and suggestions.

Controlling for the initial quality of the paper with its job market status, and author's idiosyncratic effects, I show that a standard deviation increase in the number of individual comments in a paper that received the average number of individual comments, raises the quality of the journal in which the paper is published by 18%. A standard deviation increase in the number of research seminars for a paper that was presented at the average number of seminars increases the quality of the journal by 35%. When individual comments and research seminars are weighted by quality, the impact of a standard deviation increase remains at 18% for individual comments and declines to 26% for research seminars. I find that presenting a paper at a conference does not raise the quality of the journal in which the paper is published.

To the best of my knowledge, this paper is the first to measure how peers' comments and suggestions improve the quality of a research project. This analysis is related, broadly, with the literature that explores how knowledge is produced (Stephan, 2010; Fortunato et al., 2018) and, in particular, how peers contribute to that process. Azoulay et al. (2010); Waldinger (2012); Borjas and Doran (2015); Agrawal et al. (2017) analyze how the death, migration, or arrival of star scientists affect collaborators' and other peers' productivity. This paper contributes to this literature analyzing how peers' individual and collective comments and suggestions contribute to improve the quality of other scholars' new research projects. My analysis is also linked with studies that have analyzed how conferences and meetings contribute to the flow of ideas, to increase the probability of publication, and to enhance the visibility of a paper (Lopez de Leon and McQuillin, 2018; Iaria et al., 2018; Head et al., 2019; Gorodnichenko et al., 2019). I show that the comments and suggestions received from peers individually or at research seminars have a large positive impact on the quality of new research projects. However, I do not find that conferences have a statistically significant positive effect on the quality of a paper.

The paper is organized as follows. Section 2 explores the factors governing the quality of a scientific article. Section 3 describes the dataset and presents some summary statistics. Section 4 discusses the results of the regression analyses, and Section 5 concludes.

2 A simple model of a paper's quality

In our model, there are three elements that determine the final quality of a paper: i) The quality/originality of the research idea; ii) The capacity of the author to transform the initial idea into a research paper, and iii) The comments and suggestions that the paper receives from other scholars, individually or collectively at research seminars and conferences. Analytically:

$$Q_p = (I_p^i)^{\alpha}(A_p)^{\beta}(C_p)^{\zeta}(S_p)^{\gamma} \tag{1}$$

where Q_p is the (final) quality of paper p, Ip is the quality of the research idea, A_p the quality of the author that writes the paper, C_p the number of scholars that provided comments and suggestions on the paper, and S_p the number of research seminars, workshops and conferences (seminars for short) at which paper p was presented before publication. Equation (1) has a multiplicative form because the contribution of an author to the final quality of a paper is larger the greater the quality of the research idea; and because scholars can provide more helpful comments if the quality of the idea is higher.

The main difficulty in estimating Equation (1) lies in measuring the quality of the research idea (I_p). If the quality of the research idea was orthogonal to the number of comments provided by scholars individually (C_p) or at research seminars (S_p), the estimation of the ζ and γ coefficients would be unbiased, even if we did not control for the quality of the research idea. However, as mentioned above, it is very likely that given the opportunity to deliver a seminar, scholars will choose to present what they consider as their most promising research project among the projects they are pursuing at that moment. If $Cov(I_p, C_p) > 0$ and $Cov(I_p^i, S_p) > 0$, not controlling for the initial quality of the paper will bias the ζ and γ coefficients upwards, and we will have a classical omitted variable bias problem.

To overcome this difficulty, we use a sample of PhD candidates in economics. When PhD candidates in economics enter the job market they select a job market paper. This is the paper PhD candidates use to show their research skills to potential employees. Since candidates want to be placed at the best institutions, the job market paper is the highest quality paper the PhD candidate is working on when entering the job market. Therefore, a paper's job market status provides a signal of the quality of the research idea. It is noteworthy that the job market status provides a *relative* measure of the quality of the research idea, positioning a PhD candidate's project above the rest of projects she is working on at the moment of entering the job market.

I create a dummy variable, JMP_p, that takes the value of 1 if paper p is the PhD candidate's job market paper. The papers that could also have been selected as the job

market paper but were not chosen as such take the value of zero. We substitute I_p by e^{JMP_p} in Equation (1). After taking logs, we estimate the following regression equation:

$$\ln Q_p = \alpha JMP_p + \beta \ln A_p + \zeta \ln C_p + \gamma \ln S_p + \epsilon_p \tag{2}$$

where ϵ_p is the disturbance term.

To identify more accurately the contribution of peers to the final quality of a paper, we also estimate a regression equation with author fixed effects:

$$\ln Q_p = \alpha JMP_p + \zeta \ln C_p + \gamma \ln S_p + \lambda_a + \epsilon_p \tag{3}$$

Equation (3) does not include the quality of the author, Q_a, since it is collinear to the author fixed effect, λ_a. In this specification, we identify peers' contribution to the final quality of a paper with the variation in the number of individual and collective comments among papers written by the same author, who were devised at the same period, and whose initial quality was identified by the author. We assume that, conditional on author fixed effects and the initial quality of the paper, the variation in the number of individual and collective comments received by a paper is random, allowing for a causal interpretation of our estimates.

3 Data

Our sample is composed by the PhD candidates from the top 40 US economics departments that entered the labor market between 2000 and 2018. To identify the top US economics departments we use the ranking elaborated by Ideas.[1] Every year, during the fall term, economics departments announce their job market candidates. At that time, I record each PhD candidate's job market paper. I also identify the projects that the PhD candidate could also have selected as her job market paper. These are projects whose sole author is the PhD candidate, or were written with other PhD students. I exclude papers co-authored with scholars that already had a PhD.[2] I follow the job market paper, and the papers that could also have been selected as a job market paper, until they are published.

Based on the acknowledgment section, I retrieve the information on the number of research seminars and conferences in which the paper was presented, and the scholars

[1] We use the 10-year ranking of US economics departments published in June 2019. The latest ranking is available at https://ideas.repec.org/top/top.usecondept.html

[2] I accept a paper written with a graduated scholar if the job market paper was written with the same graduated scholar.

that provided comments on the paper.[3] Table A.1 in the Appendix reports the economics departments and the PhD candidate cohorts included in the sample. It also reports the total number of graduates from each PhD program, and the number of potential job market paper projects when they entered the labor market that became journal articles. There are differences in the PhD candidate cohorts included in the sample across US economics departments. Those differences are explained by the possibility of accessing the information of "old" cohorts. Economics departments provide information about the PhD candidates that enter the labor market in the current year. Few departments also provide links to PhD candidates from previous years. To retrieve information for previous cohorts, I used the Internet Archive Library (https://archive.org/about/). In some cases, the library has a fairly complete record of the different versions that a web site had over time. However, in many cases, the information is scant, or there is no copy archived. That is why for some economics departments (e.g. UC Berkeley or MIT), I could retrieve information for "very old" PhD candidates (i.e. 2000) , whereas for others (e.g. Ohio State) I could only retrieve information about the most recent cohort.

I measure the final quality of a paper, Q_p, with the Scimago Journal Ranking (SJR) of the journal where it was published.[4] Similar to Smeets et al. (2006), I measure the quality of the PhD candidate by the quality of her placement after graduation.[5] To measure the quality of the placement, I use the worldwide economics institutions ranking elaborated by Ideas.[6] If a paper has multiple authors I add the quality of the authors.

I compute the individual comments received by a paper counting the scholars that are listed in the acknowledgments section of the paper. I also compute a quality-weighted number of comments, weighting scholars by the quality of the institution they are affiliated to. I count the number of seminars, and the number of workshops and conferences, conferences for short, at which the paper was presented. For seminars, I also calculate a quality-weighted number of seminars, weighting each institution in which the paper was presented by its quality according to Ideas.

Table 1 provides information about the construction and characteristics of the esti-

[3] I do not include the editors of the journals in the list of scholars that provided comments.

[4] This ranking is built using the average number of weighted citations received in the selected year by the documents published in the journal the three previous years.

[5] If an author reports more than one affiliation we select her latest academic affiliation.

[6] We use the 10-year ranking of institutions published in May 2019. The latest ranking is available at https://ideas.repec.org/top/top.inst.all10.html. The Ideas ranking provides a specific score for the top 5 institutions (494 institutions). For each percentile between 6 and 10, it lists, randomly, the institutions located at that percentile. To provide a score for institutions located between the 6th and 10th percentile, I ran a regression with the institutions that have a specific score. The dependent variable is the score (in logs) and the independent variables the percentile in which the institution is located (in logs) and a constant. I use the estimated coefficients to calculate a score for percentiles 6, 7, 8, 9 and 10. Note that the institutions located at the same percentile located in the 6-10 range will have the same score. If an institution is not located at the top 10, I assign it the score of an institution located at the 55th percentile.

Table 1: Information about the sample

Job market candidates	1834
Potential papers	4483
Job market candidates with a publication in a SJR journal	431
Publications in a SJR journal	623
Estimation sample	530

mation sample. I obtained data on 1834 PhD candidates that entered the job market between 2000 and 2018. These job market candidates were working on 4483 projects that could have been selected as job market papers. Among those projects, 1843 were selected as job market papers.[7] By September 2019, 431 of the job market candidates (24%) had published their job market paper or another paper they could also have selected as their job market paper in a journal included in the SJR. This percentage is in line with the results of previous studies that highlighted the low "publication productivity" of PhD graduates (Conley and Onder, 2014).[8]

623 out of of 4483 potential papers, 14%, had been published by September 2019. 46% of these publications were job market papers. This percentage is larger than the share of job market papers among potential projects (41%). 22% of the publications had more than one author, and 12% were published in a Top 5 economics journal.[9] I computed the number of individual comments for all the papers in the sample. However, there are some publications that use formulas such as "we acknowledge *numerous* seminar participants", "*several* audiences", or "seminar and conference participants". Since the number of seminars could not be computed for these publications, the estimation sample is reduced to 530.

Table 2 reports some summary statistics on the individual and collective comments received by a publication. We provide statistics for all papers, job market papers, and non job market papers. The median publication received 8 individual comments. The distribution is not skewed: the average is 10 and the standard deviation is 7. The minimum number of comments received by a publication was zero, and the maximum 35. There are 53 publications, out of 530, with no individual comments. The median publication was presented at one seminar only. The maximum number of seminars at which a publication was presented was 22. There are 209 publications, out of 530, that were not presented at any seminar. Note that the distribution of seminars per publication

[7] Note that the number of job market papers is larger than the number of job market candidates, since some PhD students have more than one job market paper.

[8] Our percentage is even lower than the 40% figure reported by Conley and Onder (2014), due to the larger presence of recently graduated students in our sample, whose papers may be still waiting a editorial decision.

[9] American Economic Review, Econometrica, Journal of Political Economy, Quarterly Journal of Economics and Review of Economic Studies.

Table 2: Summary statistics of the estimation sample

	Median	Mean	SD	Min	Max
All papers					
Individual comments	8	10	7	0	35
Seminars	1	3	4	0	22
Conferences	0	1	1	0	15
Job market papers					
Individual comments	12	12	8	0	35
Seminars	3.5	5	5	0	22
Conferences	1	1	2	0	15
Non job market papers					
Individual comments	6	8	7	0	32
Seminars	1	1	2	0	14
Conferences	0	1	1	0	6

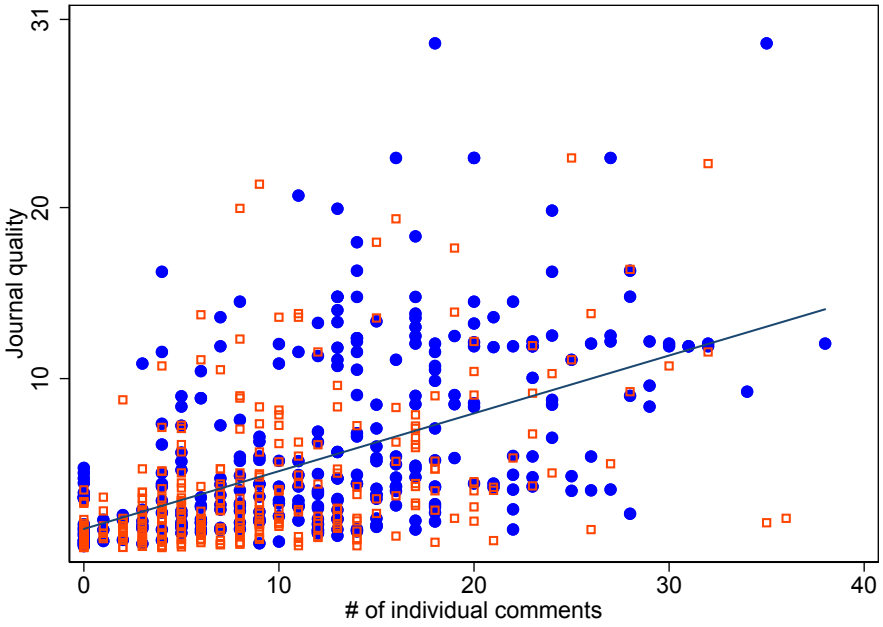
is skewed, since the average number of presentations is much larger than the median. Finally, a median publication was not presented at any conference. The average and the standard deviation is one. There is a paper that was presented at 15 different conferences, and 313 publications, out of 530, were not presented at any conference. Table 2 shows, as well, that job market papers, on average, received more individual comments, and were presented at more research seminars, and conferences than non job market papers. Specifically, the median job market paper received 6 more individual comments, and was presented at 2 more research seminars, and one more conference than a non job market paper.

Panel A of Figure 1 plots a scatter diagram of the relationship between the number of individual comments received by a paper and the quality of the journal in which it was published. Job market papers are identified by blue dots and non job market papers by red hollow squares. There is a positive correlation between the number of individual comments received by a paper and the quality of the journal in which it was published. In Panel B, I add the seminars and conferences in which a paper was presented and plot a scatter diagram for the relationship between the number of times a paper was presented and the quality of the journal in which it was published. There is also a positive correlation between the number of presentations and the quality of the journal in which the paper was presented.

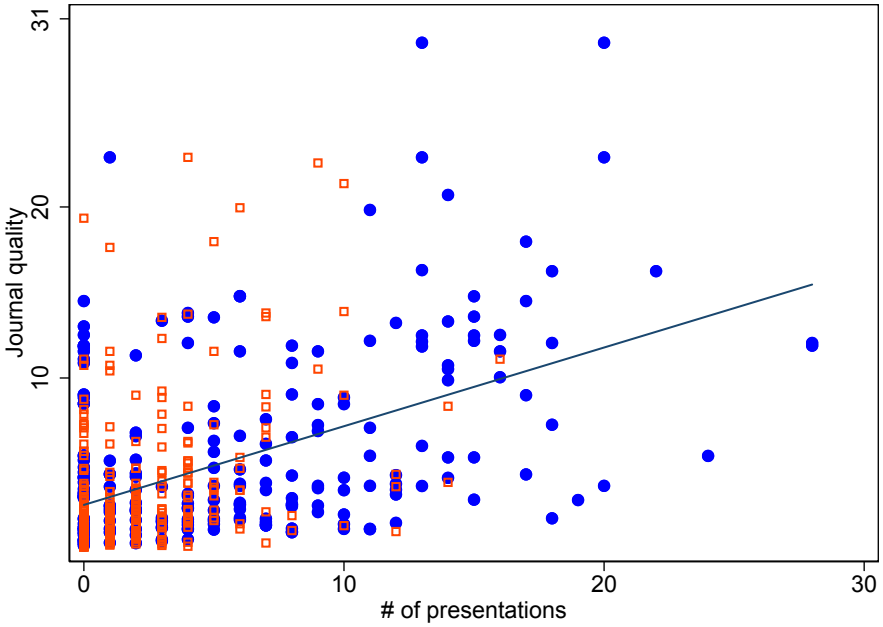
These scatter diagrams suggest that peers' individual and collective comments improve the quality of a paper. However, these correlations may be capturing the positive association between the quality of the scholar and the number of comments received from

Figure 1: Scatter diagrams

A. Journal quality vs. Number of personal comments



B. Journal quality vs. Number of presentations



Note: The quality of the journal is measured by the Scimago Journal Ranking. Presentations is the sum of research seminars and conferences a paper was presented.

peers; or the quality of the research idea and the comments received from peers. In the next section, we explore the contribution of individual and collective comments to the final quality of a paper once I control for the quality of the author and the research idea.

4 Regression results

This section presents the regression results on how peers' individual and collective comments contribute to the final quality of a paper. Table 3 presents the estimates for the impact of the unweighted number of comments given by peers' individually, and collectively at research seminars, and conferences. Table 4 presents the estimates for the quality-weighted individual and collective comments.

To keep the observations with no individual or collective comments in the sample, I introduce three additional dummy variables in Equations (2) and (3): $Comment_p$, which takes the value of 1 if the publication had, at least, an individual comment and zero otherwise; $Seminar_p$ which takes the value of 1 if the paper was presented, at least, at a seminar, and zero otherwise; and, $Conference_p$, which takes the value of 1 if the paper was presented, at least, at a conference, and zero otherwise. Now, the coefficients for the log number of individual comments, seminars and conferences capture the effect of these variables on the final quality of a paper, conditional on these variables being positive. I cluster standard errors at the author level.

First, we estimate Equation 2 with the comment variables only (Column (1) in Table 3). This estimation uses the full sample of publications: 623. Surprisingly, the $Comment > 0$ coefficient is negative, denoting that papers with one individual comment are correlated with publishing in lower quality journals than papers that did not receive any individual comment. As expected, the *ln Comment* coefficient is positive and very precisely estimated. This result indicates that receiving more individual comments is correlated with publishing in a higher ranked journal. For example, a one standard deviation increase in the number of comments, for a paper that received the average number of comments, raises the quality of the journal in which the paper is published by 53% ((7/10)*0.755). This increase would allow a paper published in a journal located in the 2nd quartile of the SJR (e.g. Oxford Economic Papers; SJR score: 0.926) to be published in a journal located in the 1st quartile (Economy and Society; SJR score: 1.384).

In Column (2) we estimate Equation (2) including the variables related to seminars only. Note that the number of observations is lower than in Column (1) since, as mentioned above, there are some papers that do not provide a valid list of seminars. Papers that were presented, at least, at a research seminar are published at a higher quality journal than papers that were not presented at any research seminar. Having presented the paper at more research seminars is correlated with publishing the paper at a higher ranked journal. For example, a standard deviation increase in the number of presentations for a paper that was presented at the average number of research seminars, raises the quality of the journal by 68% ((4/3)*0.509).

Column (3) presents the results of estimating Equation (2) with the conference vari-

Table 3: Contribution of individual comments, seminars, and other presentations to the quality of a paper. Counts

	(1)	(2)	(3)	(4)	(5)	(6)	(7)
Comment>0	-0.477^b			-0.340^c	-0.351^c	-0.246	-0.362
	(0.185)			(0.195)	(0.190)	(0.182)	(0.397)
ln Comment|Comment>0	0.755^a			0.583^a	0.517^a	0.476^a	0.262^c
	(0.049)			(0.059)	(0.059)	(0.058)	(0.154)
Seminar>0		0.200^c		-0.108	-0.096	-0.048	0.130
		(0.118)		(0.123)	(0.117)	(0.115)	(0.206)
ln Seminar|Seminar>0		0.509^a		0.355^a	0.294^a	0.194^a	0.262^b
		(0.053)		(0.055)	(0.053)	(0.056)	(0.124)
Conference			0.281^b	-0.083	-0.061	-0.055	-0.050
			(0.123)	(0.097)	(0.090)	(0.090)	(0.173)
ln Conference|Conference>0			0.241^b	0.036	0.061	0.041	-0.166
			(0.116)	(0.094)	(0.087)	(0.088)	(0.181)
ln Author(s) quality					0.127^a	0.140^a	
					(0.020)	(0.020)	
Job market paper						0.368^a	0.276^c
						(0.086)	(0.151)
Observations	623	530	530	530	530	530	198
R-square	0.321	0.225	0.041	0.362	0.411	0.430	0.245
Author(s) FE	No	No	No	No	No	No	Yes

Note: The dependent variable is the journal's log impact factor. Constant is not reported. Robust standard errors in parentheses. a, b, c: statistically significant at 1%, 5%, and 10%, respectively.

ables only. Papers that are presented at a conference are published into a higher quality journal than papers that were not presented at any conference. Moreover, presenting at more than one conference further raises the quality of the journal in which the paper is published. Specifically a standard deviation increase in the number of conferences, for a paper that was presented at the average number of conferences, raises the quality of the journal by 24%. ((1/1)*0.241). This increase is lower than those computed for individual comments and conferences.

Column (4) presents the results when the specification includes all peers' contribution variables. The *ln Comment* and the *ln Seminar* coefficients remain positive and statistically significant. However, both coefficients have a lower point value than in the previous estimations. This indicates a correlation between the number of individual comments a paper receives and the number of seminars at which it is presented. Interestingly, the conference coefficients are now close to zero. This result indicates that it is necessary to control for individual comments and research seminars when estimating the contribution of conferences to a paper's quality. According to the coefficients reported in Column (4), a

standard deviation increase in the number of individual comments and research seminars, for a paper that has an average number of comments and seminars, raises the quality of the journal in which the paper is published by 88% ((7/10)*0.583 + (4/3)*0.355).

Minondo (2019) concludes that top authors have more opportunities to present their new research projects at seminars. It is also likely that a high-quality scholars receive more individual comments since they will have more opportunities to interact with other scholars. To control for these effects, in Column (5) we introduce the quality of the authors as an additional regressor. As expected, the quality of the author is positively correlated with the quality of the journal in which the paper is published. There is also a reduction in the *ln Comment* and *ln Seminar* coefficients' point estimates, suggesting that these coefficients were partially capturing the positive correlation between the quality of the author and the quality of the journal.[10]

Column (6) presents the results when I control for the initial quality of the research idea. The job market paper coefficient is positive and very precisely estimated. According to the coefficient reported in Column (6), the quality of the journal in which job market papers were published is, on average, 44% higher than the quality of the journals in which the rest of projects were published (exp .368). The *ln Comment* and *ln Seminar* coefficients remain positive and precisely estimated. However, their point values, specially for *ln Seminar*, are lower than in Column (5). This is consistent with the argument that scholars choose to present their highest quality projects if they are invited to deliver a research seminar. In any case, even when I control for the quality of the author and the research idea, a standard deviation increase in the number of comments and seminars, for a paper with average values of these variables, still raises the quality of the journal by 59% ((7/10)*0.476 + (4/3)*0.194).

Finally, Column (7) reports the estimations when the regression equation includes author fixed effects. Note that this estimation allows us to control for all variables that are author specific, such as the capacity to transform new ideas into high-quality publications, or the "contribution-threshold" each author establishes to decide whether a peer is added to the acknowledgments section or not. There is a very large reduction in the number of observations, since I can only include in the sample the scholars that have published more than one paper. This translates into much larger standard errors. Despite the increase in standard errors, the *ln Comment* and *ln Seminar* coefficients remain positive and statistically significant. These results confirm that peers' individual and collective comments have a positive impact on the quality of a paper. Specifically, a standard deviation increase in the number of comments, for a paper that received the average number of comments, raises the quality of the journal in which the paper is

[10] We also analyzed whether papers with more than an author had a larger quality than solo papers. The coefficient for multi-authored papers was not precisely estimated.

published by 18% ((7/10)*0.262); and a standard deviation increase in the number of seminars raises the quality of the journal by 35% ((4/3)*0.262). The combined effect of these increases, 53%, would allow a paper published in Review of Economics and Statistics (8.363) to be published in the American Economic Review (11.889)

To sum-up, we find that high quality authors and job market papers are published in higher quality journals. The count estimates show that papers that received a larger number of comments from other peers and were presented at many research seminars are published in higher quality journals. Presenting at conferences does not raise the quality of the journal in which the paper is published.

Table 4: Contribution of personal comments and seminars to the quality of a paper. Weighted

	(1)	(2)	(3)	(4)	(5)	(6)
Comment>0	-0.526^a		-0.318	-0.290	-0.186	-0.548
	(0.200)		(0.210)	(0.205)	(0.197)	(0.477)
ln Comment|Comment>p5	0.280^a		0.191^a	0.164^a	0.155^a	0.104^c
	(0.021)		(0.025)	(0.025)	(0.025)	(0.055)
Seminar>0		-0.433^b	-0.426^b	-0.295^c	-0.222	-0.289
		(0.168)	(0.172)	(0.163)	(0.152)	(0.285)
ln Seminar|Seminar>p5		0.227^a	0.132^a	0.101^a	0.070^a	0.134^b
		(0.025)	(0.027)	(0.026)	(0.024)	(0.054)
Conference			0.044	0.044	0.028	0.060
			(0.103)	(0.097)	(0.095)	(0.193)
ln Conference|Conference>0			0.225^b	0.225^b	0.158^c	-0.170
			(0.092)	(0.089)	(0.089)	(0.209)
Author(s) quality				0.114^a	0.128^a	
				(0.022)	(0.021)	
Job market paper					0.523^a	0.397^a
					(0.078)	(0.132)
Observations	623	530	530	530	530	198
R-square	0.304	0.228	0.336	0.372	0.419	0.258
Author(s) FE	No	No	No	No	No	Yes

Note: The dependent variable is the journal's log impact factor. Constant is not reported. Robust standard errors in parentheses. a, b, c: statistically significant at 1%, 5%, and 10%, respectively.

In previous estimations, we assumed that all individual and collective comments contributed equally to raise the quality of a paper. However, it seems reasonable to expect that individual comments from top scholars, or comments received at presentations at top economics departments, may contribute more to improve the quality of a research project. Table 4 presents the results when individual comments and seminars are weighted by the

quality of scholars giving the comments and the institutions hosting the seminar, respectively. I cannot provide a quality-weighted measure for conferences, since I lack a quality measure for them.

I introduce a change in the definition of the *ln Comment* and *ln Seminar* variables. The sample has a sufficiently large number of publications that received a individual comment only, or were presented at a research seminar only. Hence, when comments and seminars are computed as counts, the point values of the *Comment* and *Seminar* dummy coefficients provide a fairly accurate estimation on how the quality of a publication changes when the number of individual comments and seminars increases from zero to one. However, in the quality-weighted measures there is only an observation with the minimum positive value for comments and the minimum positive value for seminars. In this case, the *Comment* and *Seminar* dummy coefficients become very noisy, since they capture the differences in quality between the papers with no comments, or no presentations, and the observation with the minimum positive number of comments, or presentation.[11] To increase the number of observations in the comparison, I define that all observations with positive individual comments, but whose value is equal or less than the value of the 5th percentile, have a *ln Comment* value equal to zero. We follow the same procedure for seminars. With this methodology, the *Comment* and *Seminar* dummy coefficients capture how the quality of a publication changes when a paper increases the quality-weighted number of comments and seminars from zero to the 5th percentile values, respectively.

Column (1) in Table 4 shows that papers receiving no comments are, surprisingly, published in higher ranked journals than papers receiving a few low quality comments. However, the quality of the journal rises as the number of quality-weighted comments increases. For example, let's take a paper that received the average number of comments, and all of them were given by scholars affiliated to institutions located at the 10th percentile of the quality ladder. If these comments were given by scholars affiliated to institutions in the 5th percentile the quality of the journal in which the paper would have been published would increase by 14%.[12]

Papers that were not presented at any seminar, surprisingly, were published at higher ranked journals than papers that were presented at a few low quality institutions. However, the increase in the quality-weighted number of seminars is strongly correlated with publishing in a higher ranked journal. For example, take a paper that was presented at the average number of institutions, and all of them were located at the 10th percentile of the quality distribution. If these seminars were hosted by institutions located in the 5th percentile, the quality of the journal in which the paper would have been published

[11] If we normalize the minimum value of the quality-weighted variables to be 1, the observation with the minimum value would be the only one with a *ln Comment* or a *ln Seminar* value equal to zero.

[12] Percentage increase in the quality weighted comments (50%)*0.28

would increase by 11%.

In Column (3) we introduce all the individual and collective comments into the estimation. The *ln Comment* and *ln Seminar* coefficients remain positive and precisely estimated. Now, the *ln Conference* coefficient is also positive and statistically significant. Columns (4) and (5) show that having a high-quality author and the job market status of the paper are correlated with publishing the paper in a higher ranked journal. Finally, in Column (6), I estimate the specification with author fixed effects. The *ln Comment* and *ln Seminar* coefficients remain positive and statistically significant, confirming that receiving comments from peers individually or collectively at research seminars increases the quality of the journal in which a paper is published. Specifically, a standard deviation increase in the quality weighted number of comments and seminars, for a paper that received the average number of quality-weighted comments and was presented at the average number of quality-weighted seminars, would rise the quality of the journal by 18% and 26%, respectively.[13]. Summing up, the estimations that include quality-adjusted comment and seminar variables confirm the positive contribution of peers' individual and collective comments to the quality of a research project.

In the baseline sample, 93 out of 623 publications (15%) acknowledged the comments received by participants at research seminars and conferences, but did not list the institutions in which the seminars were hold, or the name of the conferences. To test the robustness of my results, I re-estimate all specifications with the whole baseline sample. Note that in these specifications I cannot include the seminar and conference variables. Hence, the estimates for the *ln Comment* coefficient should be taken with caution. Since the number of individual comment is correlated with the number of seminars and conferences, the *ln Comment* coefficient may capture the effect that seminars and conferences have on the quality of the journal in which a paper is published. Table A.2 in the Appendix confirms that the unweighted and the quality-weighted individual comments have a positive effect on the quality of the journal.

5 Conclusions

Scholars cannot be aware of all the elements that may contribute to improve the quality of their research projects. To discover these elements, they rely on peers, who at research seminars, or through conversations, identify limitations in the research project and suggest avenues to improve it. In this paper, I measured the extent to which these comments and suggestions improve the quality of a research project. Since the number of suggestions a paper receives is not independent from the quality of the research idea and the quality of the author, I used a sample of papers that allow to control for these variables: the

[13] Comments= 1.76*0.104; Seminars=1.92*0.134

research projects of economics PhD candidates when they enter the labor market. I find that a standard deviation increase in the number of individual comments and research seminars increases the quality of the journal in which the paper is published by 53%. This percentage is lowered to 44% if the individual comments and research seminars are weighted by the quality of the scholar giving the comment or the institution hosting the seminar, respectively. I do not find a statistically significant effect of presenting a paper at a conference on the quality of the journal in which the paper is presented.

Our result confirms that peers comments have a very large positive effect on the quality of research projects. From the policy perspective, our results prove that funding to organize and facilitate presentations at research seminars, and interact with other scholars can improve gently the quality of research.

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Table A.1: Graduate programs in economics included in the sample

University	Cohort	Graduates	Publications
Arizona State	2016, 2018	12	0
Boston	2014, 2015, 2016, 2017, 2018	84	10
Boston College	2018	5	0
Brown	2014, 2015, 2016, 2018	30	12
Chicago	2008, 2010, 2011, 2013, 2015, 2018	72	40
Columbia	2017, 2018	39	4
Cornell	2017, 2018	38	3
Duke	2016, 2017, 2018	31	8
George Washington	2013, 2014, 2015, 2016, 2017, 2018	39	10
Georgetown	2015, 2016, 2017, 2018	18	4
Harvard	2011, 2012, 2013, 2014, 2015, 2016, 2017, 2018	196	76
Iowa State	2017	3	0
Johns Hopkins	2011, 2012, 2015, 2016, 2017	33	13
MIT	2000, 2001, 2002, 2003, 2004, 2016, 2017, 2018	80	80
Maryland	2015, 2016, 2017, 2018	45	2
Michigan	2018	17	0
Michigan State	2010, 2011, 2012, 2013, 2014, 2015, 2016, 2017, 2018	84	35
Minnesota	2016, 2017, 2018	38	1
New York	2017, 2018	33	0
Notre Dame	2011, 2012, 2013, 2015, 2016, 2018	20	12
Ohio State	2018	10	4
Oregon	2007, 2008, 2010, 2011, 2012, 2013, 2015, 2016, 2018	30	15
Penn State	2017	8	0
Pittsburgh	2014, 2015, 2016, 2017, 2018	23	13
Princeton	2014, 2015, 2016, 2017, 2018	94	16
Rutgers	2010, 2011, 2012, 2013, 2014, 2015, 2016, 2017, 2018	47	8
Southern California	2016, 2017, 2018	23	7
Stanford	2008, 2011, 2012, 2014, 2015, 2016, 2017, 2018, 2019	129	63
Texas Austin	2015, 2016, 2018	29	4
UC Berkeley	2000, 2002, 2003, 2004, 2005, 2006, 2007, 2009, 2011, 2018	187	127
UC Davis	2018	7	1
UC Irvine	2014, 2015, 2016, 2018	45	31
UC Los Angeles	2017, 2018	33	3
UC San Diego	2016, 2017, 2018	46	14
UC Santa Barbara	2016	12	6
UC Santa Cruz	2014, 2015, 2016, 2017, 2018	29	2
Vanderbilt	2014, 2015, 2016, 2018	21	9
Virginia	2016, 2017, 2018	18	1
Wisconsin-Madison	2018	16	0
Yale	2015, 2016, 2018	41	9

Note: Cohort is the year when job market candidates were announced.

Table A.2: Contribution of peers' individual comments to the quality of a paper. Full sample

Peers' contribution measured as	Absolute counts				Quality-weighted counts			
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Comment>0	-0.477^b	-0.438^b	-0.240	-0.370	-0.526^a	-0.396^b	-0.228	-0.467
	(0.185)	(0.181)	(0.172)	(0.347)	(0.200)	(0.192)	(0.183)	(0.439)
ln Comment|Comment>0	0.755^a	0.639^a	0.529^a	0.366^a				
	(0.049)	(0.049)	(0.049)	(0.133)				
ln Comment|Comment>p5					0.280^a	0.226^a	0.190^a	0.130^b
					(0.021)	(0.021)	(0.021)	(0.053)
Author(s) quality		0.148^a	0.152^a			0.135^a	0.140^a	
		(0.019)	(0.018)			(0.020)	(0.019)	
Job market paper			0.490^a	0.421^a			0.574^a	0.487^a
			(0.073)	(0.112)			(0.068)	(0.099)
Observations	623	623	623	249	623	623	623	249
R-square	0.321	0.389	0.432	0.207	0.304	0.357	0.419	0.201
Author(s) FE	No	No	No	Yes	No	No	No	Yes

Note: Constant is not reported. Standard errors clustered at the author level in parentheses. a, b, c: statistically significant at 1%, 5%, and 10%, respectively.