Seizing Research Opportunities: Does Gender Make a Difference?

Dongbo Guo [*]   Yidan Jin[†]

February 21, 2018

Abstract

Gender difference in academia and a hostile workplace culture toward women is intensifiying the under-representation of female researchers in economics. This paper examines the gender difference in economists' performance of seizing emerging and competitive research opportunities. We collect data on the publication records of 3,581 economists over the period 2000-2016 and link these data with other publicly available information on paper and author characteristics. Employing textual analysis techniques to identify papers' research fields and Difference-in-Difference specification before and after 2008, this paper empirically investigates gender difference in seizing the research opportunity triggered by financial crisis in 2008. Empirical results suggest that male economists perform better in seizing the research opportunity to expand their research fields to finance-related fields, as well as publishing more papers on financial crisis. The newly published papers on financial crisis written by female economists are more difficult to be published in top economic journals, further emphasizing that women's innate potential avoiding challenges contributes to the underrepresentation of female economists. In addition, more experienced and more productive researchers perform better in seizing the research opportunity triggered by financial crisis.

Keywords: Gender Difference, Competition, Academic Publishing

---

[*]Department of Economics, Georgetown University, Washington, DC 20057 e-mail: dg737@georgetown.edu.

[†]Department of Economics, Georgetown University, Washington, DC 20057 e-mail: yj105@georgetown.edu.

1 Introduction

Gender difference is widely discussed in the context of education, occupation and family decisions. Though women have made impressive improvement to catch up with men in all aspects, the gender gap is still persistent in term of performance in competitive environment. Research by Gneezy et al. (2009) shows that women are less competitively inclined than men in workplace, even in tasks where women may have advantage. Some other studies illustrate the gender differences in risk averse attitude toward competition, explaining that few women enter and win competitions (Gneezy et al., 2003; Niederle and Vesterlund, 2007, 2011; Booth and Nolen, 2012; Azmat et al., 2016). Although there is a large body of analysis of gender difference in engaging in competitive activities, there is little evidence on gender difference in performance under competitive environment, particular with respect to groups of people in real world scenarios without experimental design.

Remarkably little was known about the gender difference in individual productivity due to the lack of detailed data, as well as the techniques to analyze unstructured individual-level statistics. Previous studies have investigated academic publishing process such as editorial decisions of accepting or declining a paper (Card and DellaVigna, 2017), duration of academic publishing process (Ellison, 2002), and facts about papers published in top economics journals (Card and DellaVigna, 2013). While these studies focused on academic publishing process and facts about published papers, they did not examine the gender difference in the performance of publishing academic papers. Some other studies investigated the distribution of research field of scholars but focused on general trends rather than the dynamics of publication record of individual researchers (Boschini and Sjgren, 2007; Hamermesh, 2013; Kosnik, 2015; Angrist et al., 2017). In addition, constrained by the availability of data on paper manuscripts, as well as the technical challenge to measure the high dimensional "features" of papers and authors, some potentially important characteristics of papers and authors were not included in their analysis.

When it comes to issues in the workplace of universities and research institutions where

educated people concentrate, the problem of gender imbalance is still valid. Women are staggeringly underrepresented in economics departments and made up just 20 percent of tenure track faculty according to American Economic Association. Women face a ticker glass ceiling with a lower rate of tenure rate after adjusting for differences in family circumstances and publication record. Compared with men, women are usually experiencing inferior status and low possibility of tenure. Women in economics are unhappier both than the men they work with and than the women who work in other disciplines, including those with similar gender disparities. (the economist) Whether the relative ability, innate preferences or the unkind working circumstances give rise to the underrepresentation of female economists in general is a practically significant topic when we discuss in the context of gender difference broadly. Moreover, the discussion result can also be extended beyond university campus to all disciplines. This paper provides some insights into the gender difference in seizing emerging and competitive research opportunities. By delving into the relationship between gender and competitive preference, we are able to disentangle the problem that female inner preference toward competition engenders the inferior status of female researchers in terms of paper publication quantity and quality.

We collect data on publication history of 3,581 authors who have publications in the top 5 economics journals during 1990-2011 and link these data with other publicly available information on author background and collaboration network information. We parse authors' publication record and collaboration network to measure their number of (top) publications and strength of collaboration network in each field. In addition, we use textual analysis and machine learning techniques to analyze each paper's abstract and the list of papers that cite it to construct measures of paper's research fields and cumulative citations. Comparing economic professions' participation rate in different research fields, We find that females are generally more labor and health field oriented. This result is consistent with the result in Boschini and Sjgren (2007).

In order to control for unobservable bias, we use Difference-in-Difference (DID) method to

study how financial crisis affects professions' number of papers and citations in related topics. The results show that women were less likely to compete with males in the field of financial crisis after 2008 when financial crisis became a hot emerging topics for economic professions. We also investigate the change of individuals' publications in the top 5 economics journals, top field economics journals, and all economics journal publications, and the results show that the financial crisis 2008 has positive effect on both male and female economists' publishing papers on financial crisis. However, the new papers on financial crisis written by female economists were more difficult to be published in top economic journals. Furthermore, the financial crisis 2008 has heterogeneous effect on the economists, and compared with young economists, more productive and experienced economists who have research experience more than 20 years performed better in seizing new research opportunities.

The main contribution of this paper is to examine the gender difference in performance of highly educated individuals in response to emerging and competitive opportunities. Conditional on authors' performance, this study confirms the initial hypothesis that female is more risk averse toward changing research fields and participating in the competition of publication in hot and competitive topics. The results could help understanding factors associated with gender differences in competition. In addition, the results in this paper suggest public policies to encourage high-ability female to enter competitions and further eliminating gender gap in highly educated groups. The analysis of this paper can be extended to a general circumstance rather than educated researchers. For example, policy makers may consider reducing competitiveness levels of labor market at the early stage of employee's career in order to mitigate the disadvantage of female workers in competitive environment.

The rest of the paper is organized as follows. In Section 2, we provide an overview of our data. Section 3 describes our identification strategy. Section 4 provides main results and sensitivity analysis. Section 5 concludes.

2 Data and Textual Analysis

2.1 Academic data

We collect academic data including paper citation lists, paper information (including the journal of publication, publication date, title, abstract, and author name list), and author publication lists from Microsoft Academic (MA) database. An overview of Microsoft Academic database is provided by Sinha et al. (2015). We use Microsoft Academic database as the main source of academic data for several reasons. Firstly, the database has a wide coverage and accurate records of publication data. It also provides Application Programming Interface (API) for sending queries to its database, and the data collection process does not need human intervention. Secondly, paper id and author id can be accessed from Microsoft Academic database. This feature significantly increases the accuracy of constructing paper citation list and author citation list. Thirdly, the rate limit of Microsoft Academic API is fairly high. This feature makes it possible to collect a large group of researchers' social network data, which requires sending a lot of queries to the academic database.

2.2 Journals and authors data

2.2.1 Selection of journals and authors

The data used in this paper is the yearly data of 3,581 economic researchers who have publications in the top 5 economics journals (Quarterly Journal of Economics, Journal of Political Economy, American Economic Review, Econometrica, and Review of Economics and Studies) during 1988-2011. The dataset spans from 2000 to 2016.

After cleaning and matching the data of papers and authors, we use the textual analysis algorithms described in Appendix A to form a panel for individual researchers with number of papers in each field over 17 years. Because the database does not provide gender information, we developed an textual analysis algorithm to use common male and female English name dictionary to identify authors' gender. Genders of uncommon first names are searched

individually online to justify personal webpage and maintain the accuracy. The variables in the constructed dataset are gender, years of experience[1], number of (top) publications by research fields, and coauthor information[2]. Table 1 presents the summary statistics of these variables. Table 1 shows that in the top 5 economics journals, female authors constitute 13.12% of the total number, far less than the percentage of male authors. Moreover, female have lower average number of coauthors than males. This fact reflects similar arguments in other research papers that females are less capable of cooperating with others compared with males in academic economics departments.

Another variable that shows interesting difference between male researchers and female researchers is the year of experience, which is defined by the difference between 2017 and the first year of publication in all economics journals. We divided experience years into four groups, "0-20 years", "20-30 years", "30-40 years", and "40+ years". The detailed distribution table and graphs are in Appendix C. The percentage of female researchers decreases with the increase of experience year in our database. In particular, male authors are more productive than female authors in terms of number of paper written. The cumulative number of papers of males is much more than the number of papers written by females in all three panels. The number of papers published in top fields and top 5 journals are far more less than the total number of paper published in all economics journals, indicating the difficulty of producing high quality research papers. Beyond these differences, the cumulative number of citations in 2016 suggests that males also have more citation compared with females. Among all potential causes of difference of paper productivity and quality, total number of papers, total number of citations and coauthors information gives us evidence that females are inferior to male researchers in all aspects.

---

[1]We define the year of experience as the total number of years from when each author first published on economic journals.

[2]Coauthors variables are collected from their publishing papers, including number of coauthors of each author, number of papers each individual has, and number of coauthors in different research fields.

2.2.2 Paper field classification

The classification of paper research fields is accomplished with textual analysis program according to two-digit JEL code classification and keywords available on American Economic Association websites. The developed algorithms extract keywords from each paper's abstract in order to determine paper fields, since many papers in the database do not have a JEL code available. The textual analysis algorithm used to determine the research fields of papers is a dictionary-based algorithm that related to studies using similar algorithm (Tetlock, 2007; Gentzkow and Shapiro, 2010; Loughran and Mcdonald, 2014).

Before proceeding to the regression result explaining the effect of financial crisis on authors' research fields' choice, it is useful to make some simple comparisons among top 5 articles, top field articles and all available articles for different research topics. Table 1 presents the means of journal variables by different fields of research in all economics journals. To compare other research fields with financial crisis, we mainly list three representative fields based on previous literature and intuition according to Boschini and Sjgren (2007)'s conclusion – C73, stochastic and dynamic games which female are less and relatively inferior to male; I12, health behavior which female are more and superior to male in economic research; O13, agriculture, natural Resources, energy and environment which female and male are comparable. In particular, health economics and environmental economics have relative higher percentage in top 5 and top field journals but with decreasing or constant trend after financial crisis in 2008. Thus, as we find positive consequences of financial crisis on financial crisis related research topics, we do not find a obvious effect of the event on the change of paper numbers in chosen sub research fields such as health economics, mathematical economics and agricultural economics.

We also compare paper production of authors by difference research fields. The average number of paper is the year average of number of paper for a given year. Researchers produce relatively more papers in the field of industrial organizations than other research fields. The yearly trend of each research field is shown in Figure 1. For the group of top

authors in our dataset, we find males have higher average number of papers in mathematical economics research fields, which does follow the finding in other papers that women are inferior to men in the field of mathematical. We also confirm females' superiority in health economics. However, females have lower participation rate in agricultural economics, which previously viewed as equivalence between males and females in other literatures. Due to these difference, our regression analysis will control for the number of papers to further discuss the effect of writing papers in competitive research fields on gender productivity.

[Insert Figure 1 here]

First of all, we define the competitive level of each research field and use these representative research fields to test the exogeneity of our Difference-in-Difference specification in the estimation section. From the perspective of journals, Table 2 first presents the means of number of papers in each journal by different year groups and citations in top5, top30, and all economic journals in our sample size. The average number of papers in economic journals is highest in 2000s. The number confirms a trend of increasing number of papers by year. Figure 2 shows the comparison of top field and top 5 journals' paper percentage in financial crisis. There is a significant increase in the percentage after each world wide financial crisis in 2008. Thus, these results suggest a positive effect of financial crisis on journals choice of paper publishing. Compared with top field journals, top 5 journals have a higher percentage of papers about financial crisis, indicating a higher preference toward financial crisis topic papers. However, it also shows that top 5 journals have higher preference toward many other research topics such as C73. Figure 2 shows a steady higher percentage of contribution of C73 topic papers over the recent 40 years. When compared with C73, financial crisis topic papers still have a higher percentage in the top 5 journals contribution. The result is more obvious in the top field journals, since the number of papers about financial crisis is increasing rapidly after 2008.

Secondly, when summarizing the number of papers for different research field, we find a significant increasing number of papers in financial crisis topics around 2008. Figure 3 represents the comparison of paper numbers in research fields which directly and indirectly related with financial crisis. From the contrast, there is a obvious jump in the number of papers for financial crisis papers compared with non financial crisis papers on the left graph. For the direct competition with other finance topic papers, financial crisis papers' number also exhibit a severe rising pattern. We would employ the exact effect of year 2008 on professions' research choice performance by comparing these target variables in the estimation section. The number of finance paper is an average of different research fields in the category G according to the JEL code. Moreover, the number of non financial crisis papers are average number of papers for each professions who does not have a paper categorized as G01 in each year.

Next, we present the graphic trend of each research fields in comparison in terms of number of papers, which is our main variable of interest. From Figure 4, we would see the highest average of paper numbers lies in agricultural economics O13. Mathematical economics C73 obtains the lowest level in our comparison. However, among all compared fields, we could obviously conclude that only financial crisis's paper tremendously increases. The other fields either maintained the levels or decreased in terms of paper numbers. Figure 5 also represents the trend of number of papers by male and female for further proof of fact in economics research gender gap. Only in health economics, females' average of number of papers in this topics are weighted above the paper number of males, consistent with previous literature that females are skilled in health economics.

[Insert Figure 4 here]

[Insert Figure 5 here]

With the help of full record citation patterns of authors in our dataset, we include paper citation numbers as one explanatory variable in future analysis. Table 1 presents demographic summaries of gender difference in terms of paper citations. Women, according to the summary statistics, have relatively lower citations compared with men in economic papers publications by truth. In order to simultaneously control for these differences and internal causal relationship between gender and research field productivity, we use Difference-in-Difference (DID) method.

[Insert Table 1 here]

[Insert Table 2 here]

3   Estimation

We use Difference-in-Difference (DID) method to estimate the gender difference in seizing the research opportunity triggered by financial crisis 2008 to publish academic papers. We use financial crisis 2008 as the cutoff because of its exogeneity with potentially omitted variables affecting authors' paper production.

Our baseline estimates are based on data of authors from 2000 up to 2016. The treatment is financial crisis in 2008 that triggers research opportunity for financial crisis field. Authors who has published papers in financial crisis field (treatment group) are more exposed to the research opportunity than authors who does not write articles in the field. More thoughts need to be developed toward new researchers who first published in this field, so more analysis in different cohort is necessary and explained in the robustness check section. Moreover,

in order to avoid the effect of financial crisis in other early time period, we only use the abbreviated panel 2000 to 2016 in our study. This panel time range is to support the common trend assumption associated with different in difference method. Credit to our textual analysis algorithm, papers involving financial crisis topics will automatically be assigned in this category no matter its' general category(e.g., macroeconomics, microeconomics, labor economics). The assumption of using Difference-in-Difference method is that, the average change in the professions who had research experience in financial crisis related topics represents the counter-factual change in the group of researchers who published papers in financial crisis if there were no financial crisis in 2008. We examine the link of number of papers in the research topics "financial crisis" before and after the financial crisis using the following specification:

$$y_{ist} = \lambda_s + \delta D_{st} + X_{ist}\gamma + \epsilon_{ist} \tag{1}$$

$$E[y_{0ist}|s, t, x_{ist}, D_s t] = E[y_{0ist}|s, t, x_{ist}] = \gamma_s + \lambda_t + X_{ist}\beta \tag{2}$$

$D_{st} = 1$ in treatment group in after year 2008, and 0 otherwise. We can also write the model as, $D_{st} = T_s * d_t$,

$$y_{ist} = \beta_0 + \beta_1 T_s + \beta_2 d_t + \delta(T_s * d_t) + X_{ist}\gamma + \epsilon_{ist} \tag{3}$$

T_s is dummy for treatment group, and d_t is the observation for author's behavior of changing topics after 2008. X_{ist} is a vector of basic characteristics for economics professions including, experience year, number of coauthors, number of single author papers, number of paper published, number of paper published in financial crisis, number of papers of coauthors, number of papers published together with coauthors, and number of coauthors the author has. λ_s represents individual author's fixed effect in control. We use the DiD methods on male and females and then conclude the difference impact of financial crisis on male and female's research field expansion. Figure 6 presents the comparison between treatment and control group described above. The From non financial paper number graph on the right

hand side, we could see there is no difference between two groups, further supporting out exogenous assumption of DID assumptions. Treatment group is more likely to be treated compared with control group, according to Figure 6 on the left side.

With more detailed panel data about top 5 journals publication history, we are able to compare female composition in top 5 journal publication, top field journal publications and publication for all journals. The result helps explaining whether the quantity or quality of female explaining the lower participation rate in competitive research files and lower citation pattern. It could also give further implication explaining the lower composition in female full professors.

Following the same method stated above to analyze the participation rate of economics research fields, we conduct the same method on estimation for citation patterns of each economic researcher. More specifically, the citation did regression will contrast authors who have published financial crisis related paper and those who didn't to obtain the direct influence of the treatment on paper production in the context of gender comparison. When linking average citation per paper with individuals' research field choices, we can argue the gender gap in paper quality and paper publication.

4 Results and Discussion

4.1 Estimation results

For all authors' participation in economics research fields, We estimate the equation(1) with the DID specification. Estimates of the average treatment effect reveals whether the occurrence of financial crisis in 2008 affects or more specifically, increases the number of papers in financial crisis related topics and citations for each researcher.

In Table 3, we report nine regression estimate of equation (3) in which the dependent variable is number of papers written in financial crisis topics (JEL code G01) in a given year. The control group is all individuals who have papers written in financial crisis top-

11

ics papers ever and are more treated than the control group. We separately estimate the number of papers published in all economics journals in the database, the number of papers published in top field economics journals and top 5 journals' paper publication. As shown in the first column of each category, the number of papers about financial crisis increases after the appearance of financial crisis in 2008. The effect of shock is the highest in all economics journals, increasing number of papers in related topics by 7.41%. Compared with all economic journals, top fields journals has relative lower effect and top 5 journals are the least affected. The shock of financial crisis has statistically positive effect on the number of related paper publication, but with minor number. It could be argued that top fields and top 5 economic journals' papers are well selected with higher preference on theoretical and economics topics and usually experience lags due to their long publication cycles , which would contribute to the low effect of financial crisis for top journals' publication.

[Insert Table 3 here]

As we are more interested in the estimates of gender difference in paper production after the appearance of hot topics, the first column of each category includes the estimate of gender on number of papers published in the journals. We proceed the estimation for male and female subgroups in order to distinguish the effect of financial crisis on paper creation. The second and third columns under each panel imply the estimation on the subgroup of male researchers and female researchers. In this case, we now control all variables related with coauthors' number, coauthor groups, top journal publications, and coauthored papers' number. We find that the impact of financial crisis on male is roughly 7.67%, higher than the DID coefficient 4.90% for females. Therefore, the effect of financial crisis is much higher for males than females, illustrating a higher participation in the hot topics research fields. The coefficients for males and females for top field and top 5 journals' panel are similar to papers in all journals but with higher coefficient for males than female authors. However, Insignificant interested DID coefficients for females imply no effect of emerging competitive

12

topics on women's research field choice. We could infer from the results that there is a gender difference in authors' expansion of research topics. Other explanatory variables in Table 3 are found to have intuitive signs but not shown in the table. Having higher number of coauthors in the field of financial crisis will result in lower production of papers in financial crisis related topics. More papers publication has positive effect on dependent variables.

The previous result inspires an interesting explanation for the low insignificant effect of women's performance in financial crisis related research. One reason could be due to the risk aversion behavior of women in general. Females cannot seize this emerging competitive research opportunity because they would avoid taking risks in doing research. Besides, another explanation could be women have tried producing papers in this field but with lower quality or no significant results. Females cannot publish their papers, therefore we do not have observation here in this dataset. On the other side, males may produce papers with high quality, advertise their papers more successfully or females may be discriminated especially when publishing in top journals. To distinguish different factors, discussion section will introduce heterogeneous treatment effect analysis to separate all authors into different experience groups. Fixed effect of authors' affiliation will also be added to eliminate the uncertainty of difference in institutions. Based on the amount of paper production, authors' heterogeneous groups would help explain this fact more elaborately.

In table 4, we switch the dependent variable from papers published in three different panels to single author paper publication in the panels. In panel A, the introduction of financial crisis increases the number of papers in this topic 7.44%, higher than female but lower than the effect for all papers publication. When consider the single papers, the effect of emerging financial crisis is equivalent to previous dataset. For panel B top field journals, gender difference is persistent with a insignificant negative coefficient for females. But for females publishing for top5 journals, female respond stronger to the emerging hot topic financial crisis. For previous two panels, the fact further illustrates that women are reluctant to write papers in this topic and compete with an increasing number of papers no matter in

general or in top academia. For top 5 journals publication, the difference effect of financial crisis on gender's solo papers would be further discussed.

[Insert Table 4 here]

It is also interesting to compare finance related paper (JEL code G category) paper publication and non financial crisis papers (JEL code besides G). One illustrates the effect of financial crisis on related topics in finance and the other would reveal the effect of our cutoff on indirect competition. Table 5 shows the treatment group's number of average finance categorized papers publication. In our sample, gender-gap in number of coauthored papers is not statistically significant in all panels when compared with the previous result. Male and female's DID coefficients are insignificant and inconsistent for different three panels. This suggests that the financial crisis does not have a obvious effect on average finance papers. There is no direct competition for researchers in related research fields. For Panel B and C, the DID coefficient for males and female appears to be negative after the shock of financial crisis in 2008 but with insignificant coefficient. We would thus believe no direct competition between financial crisis and finance papers.

[Insert Table 5 here]

As shown in Table 6, we also compare the effect of shock on other non financial crisis economics research fields mentioned above to verify financial crisis as a competitive and hot research field. We can easily conclude from the table that non finance paper are significantly affected by the financial crisis in 2008. All interested coefficients are statistically significant. Indirectly, non finance research fields are affected by this emerging research opportunity. Consistent with previous result, males are heavily affected than females and turned to have more paper published in financial crisis topics. Based on same method reported above, we tested on mathematical economics, health economics and environmental economics. The

premiums of financial crisis on these research fields' paper production are either negative or insignificant, indicating the validity of our Difference-in-Difference specification. More details are in the robust check section. Table 6 only presents the result of non-financial papers generation. We can see negative relationship between financial crisis and other research topics. The different tested research fields are included in the appendix.

[Insert Table 6 here]

4.2   Measuring treatment effect heterogeneity

In this section, we present regression results of measuring paper productions in the field of financial crisis by different groups to document the distribution of treatment heterogeneous effect. We mainly define two dimensions measuring the heterogeneity – the year of experience and the production quantity. Since authors' affiliations are not available for the whole sample size, we didn't include it into the general estimation. The estimation results infer that including authors' affiliations will not change previous results much.

In order to simplify the category, we use only two experience group in comparison: below 20 years and above 20 years of experience. Table 7 highlights the fact that women with longer experience in economics research are more willing to write papers in hot emerging topics such as financial crisis, the treatment in our study. Men's decision in research topic expansion also follows previous result, since the effect of financial crisis on the paper production are higher for more experienced group. While the effect of shock is around 3.73% for female researchers less than 20 years of experience, females with more than 30 years of experience write 5.21% more papers in this area.

[Insert Table 7 here]

As we separate authors in two subgroups according to their number of cumulative papers in

year 2016 – high production above the average and low production group below the average, regression results are presented in table 8. High productive authors intend to write more papers in financial crisis than less productive authors.

[Insert Table 8 here]

4.3   Robust Check

To eliminate the concern of financial crisis spillover effect to other research fields in economics, we also conduct similar regression testing the effect of shocks on other fields listed previously, C73 mathematical economics, I11 health economics, and O13 agricultural economics. The selection of research fields follows previous explanation of gender comparison. The effect of financial shock on mathematical economics is extremely low and negative. The effect of financial crisis does not affect agricultural economics from the regression. Instead, Health economics papers' numbers are positively affected, which could be explained by two possible reasons. Firstly, there are many interdisciplinary papers involving both health and financial economics or financial crisis, so those paper would be categorized in these two fields as well. The other possible explanation is that both health economics and health economics are hot topics in recent years and contribute to authors' citations but not as hot as financial crisis in the economics research. However, the number are far below the coefficient previous when testing financial crisis papers. According to previous results studying the number of papers in other economic research fields, we are confident in concluding financial crisis did not directly affect other fields' participation or even attracts scholars from other fields to financial economics. Three different panels deliver inconsistent and relatively insignificant results, further illustrating financial crisis are not correlated with the rest of research topics.

Another test we conduct here is to use different time period as cutoff in treatment. We also found convincing support for our DID specification by using cutoff year 2002 and 2015. Non of the test are comparable as significant as our baseline model.

[Insert Table 10 here]

[Insert Table 11 here]

[Insert Table 12 here]

[Insert Table 13 here]

5 Conclusion

Gender difference can be a broad question to be discussed in different disciplines with different answers. By focusing on economics professions, we discuss the role of people's inner preference toward competition on paper generation and publication, a way to quantify personal productivity. The detailed database from Microsoft Academic helps us formulate a elaborate panel to study this social issue.

In this paper, we contribute to the research on gender imbalance by evaluating the gender difference in seizing emerging and competitive research opportunities. We use financial crisis 2008 as exogenous shock that brings emerging and competitive opportunities for publishing papers on financial crisis. The results provide some evidences of gender difference in economics journal publication. Male researchers are more successful in expanding their research fields to new research area when compared with female researchers. The financial crisis also shows a stronger effect on male researchers in terms of field participation rate and number of papers on financial crisis. When adding other unobservable heterogeneity into consideration, results are still robust. The difference of people's preference toward competition and the disparity between males and females did contribute to the underrepresentation of women in economics academic careers.

Our results may provide useful policy implications. First, reducing the competitiveness of publication system can improve the success rate of women in higher education indus-

try. Second, reducing the competitiveness is more useful to female researchers at the early stage of their careers as gender difference in seizing research opportunities is wider among junior researchers. Following our analysis, there will be a encouraging and kind working circumstance for academic professionals of all genders.

References

Angrist, Joshua, Pierre Azoulay, Glenn Ellison, Ryan Hill, and Susan Feng Lu, "Economic Research Evolves: Fields and Styles," *American Economic Review*, 2017, *107* (5), 293?297.

Azmat, Ghazala, Caterina Calsamiglia, and Nagore Iriberri, "Gender differences in response to big stakes," *Journal of the European Economic Association*, 2016, *14* (6), 1372–1400.

Booth, Alison L. and Patrick Nolen, "Gender differences in risk behaviour: does nurture matter?," *The Economic Journal*, 2012, *122* (558).

Boschini, Anne and Anna Sjgren, "Is Team Formation Gender Neutral? Evidence from Coauthorship Patterns," *Journal of Labor Economics*, 2007, *25* (2), 325–365.

Card, David and Stefano DellaVigna, "Nine facts about top journals in economics," *Journal of Economic Literature*, 2013, *51* (1), 144–161.

_ **and** _ , "What Do Editors Maximize? Evidence from Four Leading Economics Journals," Working Paper 23282, National Bureau of Economic Research March 2017.

Ellison, Glenn, "The Slowdown of the Economics Publishing Process," *Journal of Political Economy*, 2002, *110* (5), 947–993.

Gentzkow, Matthew and Jesse M Shapiro, "What drives media slant? Evidence from US daily newspapers," *Econometrica*, 2010, *78* (1), 35–71.

Gneezy, U., M. Niederle, and A. Rustichini, "Performance in Competitive Environments: Gender Differences," *The Quarterly Journal of Economics*, Jan 2003, *118* (3), 1049–1074.

Gneezy, Uri, Kenneth L Leonard, and John A List, "Gender differences in competition: Evidence from a matrilineal and a patriarchal society," *Econometrica*, 2009, *77* (5), 1637–1664.

Hamermesh, Daniel S, "Six Decades of Top Economics Publishing: Who and How?," *Journal of Economic Literature*, 2013, *51* (1), 162?172.

Kosnik, Lea-Rachel, "What Have Economists Been Doing for the Last 50 Years? A Text Analysis of Published Academic Research from 1960-2010," *Economics*, 2015, *9* (13), 1–38.

Loughran, Tim and Bill Mcdonald, "Measuring Readability in Financial Disclosures," *The Journal of Finance*, 2014, *69* (4), 1643–1671.

Niederle, M. and L. Vesterlund, "Do Women Shy Away From Competition? Do Men Compete Too Much?," *The Quarterly Journal of Economics*, Jan 2007, *122* (3), 1067–1101.

Niederle, Muriel and Lise Vesterlund, "Gender and Competition," *Annual Review of Economics*, 2011, *3* (1), 601–630.

Sinha, Arnab, Zhihong Shen, Yang Song, Hao Ma, Darrin Eide, Bo june Paul Hsu, and Kuansan Wang, "An Overview of Microsoft Academic Service (MAS) and Applications," in "Proceedings of the 24th international conference on world wide web" ACM 2015, pp. 243–246.

Tetlock, Paul C., "Giving Content to Investor Sentiment: The Role of Media in the Stock Market," *The Journal of Finance*, Aug 2007, *62* (3), 1139–1168.

Table 1: Summary statistics of authors

	Male	Female	Total
Author information			
Number	3052	529	3,581
Percentage	86.88	13.12	100.00
Experience year	26.88	21.69	26.15
0-20 years	79.80	20.20	100.00
21-30 years	87.22	12.78	100.00
31-40 years	92.75	7.25	100.00
41+ years	97.23	2.77	100.00
Cumulative number of papers published	44.74	29.78	42.78
Cumulative paper citations	2,738.85	1,515.44	2,578.30
Cumulative citations of paper published before 2008	2,442.50	1,267.40	2,288.29
Cumulative number of papers published in top 5 journals	3.54	2.44	3.40
Cumulative number of papers published in top field journals	12.46	7.64	11.82
Research field (Participation rate)			
Financial crisis G01	0.0427	0.0360	0.0418
Mathematical Economics C73	0.0194	0.0138	0.0187
Health Economics I11	0.0485	0.0498	0.0487
Agricultural Economics O13	0.2205	0.1856	0.2160
Coauthor information			
Number of coauthor (2016)	3.8701	3.4556	3.8157
Average number of coauthor in top 5 journals (2016)	0.1142	0.0832	0.1101
Average number of coauthor in top field journals (2016)	0.4677	0.3516	0.4525
Average number of coauthored papers (2016)	1.6585	1.4159	1.6266

Table 2: Summary statistics of economic journals

Year	1950-1960	1961-1970	1971-1980	1981-1990	1991-2000	2001-2010	2011-2017
Top 5 Journals							
Average number of papers by year	6.420	10.700	28.180	48.220	53.400	73.120	97.143
	1.273	2.261	6.251	9.111	5.464	11.915	8.573
Research field							
Financial crisis G01 average number	0.395	0.425	0.251	0.509	0.764	1.249	3.022
	0.915	0.440	0.275	0.203	0.206	0.242	0.667
Mathematical Economics C73	0.000	0.000	0.378	1.389	3.163	2.291	2.291
	0.000	0.000	0.418	1.025	0.809	0.766	0.880
Health Economics I11	0.571	0.694	1.505	0.814	1.477	2.691	3.411
	1.807	1.252	1.108	0.432	1.008	0.562	0.670
Agricultural Economics O13	8.310	8.256	12.296	13.554	12.802	15.292	18.861
	5.178	3.873	2.721	2.532	2.683	2.109	1.220
Top Field Journals							
Average number of papers by year	0.807	2.859	7.569	17.844	33.832	56.150	75.437
	0.432	1.073	1.865	6.030	5.068	10.019	5.562
Research field							
Financial crisis G01 average number	0.395	0.425	0.251	0.509	0.764	1.249	3.022
	0.915	0.440	0.275	0.203	0.206	0.242	0.667
Mathematical Economics C73	0.000	0.167	0.145	0.477	1.245	1.122	1.101
	0.000	0.250	0.159	0.371	0.194	0.155	0.165
Health Economics I11	1.386	1.339	2.096	1.504	1.463	1.848	2.144
	1.610	0.985	0.554	0.404	0.206	0.460	0.277
Agricultural Economics O13	8.155	6.580	9.581	11.627	11.785	13.902	15.975
	3.674	1.022	1.735	1.430	0.941	1.077	0.946

Table 3: Number of papers on financial crisis(JEL Code: G01)

	All Journals			Top Field Journals			Top 5 Journals		
	All	Male	Female	All	Male	Female	All	Male	Female
time	0.00621***	0.00659***	0.00430	0.00062	0.00095	−0.00104	0.00049	0.00067*	−0.00033
	(0.00223)	(0.00238)	(0.00626)	(0.00067)	(0.00068)	(0.00212)	(0.00030)	(0.00034)	(0.00040)
did	0.07412***	0.07671***	0.04897***	0.02116***	0.01606*	−0.00208	0.01001**	0.01086**	0.00754
	(0.00631)	(0.00677)	(0.01844)	(0.00776)	(0.00941)	(0.01796)	(0.00482)	(0.00518)	(0.01240)
experience years	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
number of papers	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
number of coauthors	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
number of coauthors' papers	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Observations	65,964	57,538	8,426	65,964	57,538	8,426	65,964	57,538	8,426
R^2	0.32734	0.33365	0.30295	0.45612	0.55825	0.24950	0.73936	0.72979	0.84471
Adjusted R^2	0.28341	0.29031	0.25512	0.42061	0.52951	0.19800	0.72234	0.71222	0.83406

Note: *p<0.1; **p<0.05; ***p<0.01

Table 4: Number of solo-authored papers on financial crisis (JEL Code: G01)

	All Journals			Top Field Journals			Top 5 Journals		
	All	Male	Female	All	Male	Female	All	Male	Female
time	0.00505***	0.00487***	0.00659	0.00060	0.00062	0.00053	0.00027	0.00030	0.00002
	(0.00128)	(0.00134)	(0.00401)	(0.00040)	(0.00044)	(0.00059)	(0.00024)	(0.00028)	(0.00004)
did	0.07443***	0.07873***	0.03515	0.02076	0.02682**	−0.04375	0.04518**	0.04289**	0.09710***
	(0.00905)	(0.00956)	(0.02677)	(0.01271)	(0.01289)	(0.05362)	(0.01784)	(0.01841)	(0.00084)
experience years	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
number of papers	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
number of coauthors	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
number of coauthors' papers	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Observations	65,964	57,538	8,426	65,964	57,538	8,426	65,964	57,538	8,426
R^2	0.07763	0.07574	0.10862	0.02723	0.03040	0.03159	0.04348	0.04586	0.06335
Adjusted R^2	0.01741	0.01562	0.04746	-0.03628	-0.03267	-0.03486	-0.01898	-0.01620	-0.00092

Note: *p<0.1; **p<0.05; ***p<0.01

Table 5: Number of papers on financial economics (JEL Code: G)

	All Journals			Top Field Journals			Top 5 Journals		
	All	Male	Female	All	Male	Female	All	Male	Female
time	−0.00074	−0.00035	−0.00338	0.00115	0.00112	0.00133	0.00066	0.00070	0.00027
	(0.00168)	(0.00182)	(0.00447)	(0.00078)	(0.00085)	(0.00196)	(0.00041)	(0.00044)	(0.00119)
did	−0.00052	0.00027	−0.00576	−0.00077	−0.00085	−0.00086	−0.00068*	−0.00080*	0.00014
	(0.00137)	(0.00147)	(0.00381)	(0.00061)	(0.00066)	(0.00162)	(0.00039)	(0.00042)	(0.00099)
experience years	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
number of papers	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
number of coauthors	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
number of coauthors' papers	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Observations	65,964	57,538	8,426	65,964	57,538	8,426	65,964	57,538	8,426
R^2	0.65297	0.65134	0.66834	0.64727	0.64838	0.64505	0.64951	0.65184	0.63283
Adjusted R^2	0.63031	0.62867	0.64558	0.62424	0.62551	0.62070	0.62662	0.62919	0.60763

Note: *p<0.1; **p<0.05; ***p<0.01

Table 6: Number of papers not on financial economics (JEL Code: G)

	All Journals			Top Field Journals			Top 5 Journals		
	All	Male	Female	All	Male	Female	All	Male	Female
time	0.04369***	0.03739**	0.08343**	0.00692	0.00993	−0.01354	0.00189	0.00386	−0.01152
	(0.01380)	(0.01481)	(0.03847)	(0.00885)	(0.00958)	(0.02276)	(0.00516)	(0.00553)	(0.01444)
did	−0.04939**	−0.05942***	0.02845	−0.03659*	−0.04149**	0.03487	−0.03875*	−0.04669**	0.02598
	(0.02108)	(0.02243)	(0.06326)	(0.01969)	(0.02113)	(0.06510)	(0.02163)	(0.02332)	(0.05152)
experience years	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
number of papers	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
number of coauthors	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
number of coauthors' papers	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Observations	65,964	57,538	8,426	65,964	57,538	8,426	65,964	57,538	8,426
R^2	0.30881	0.30905	0.31115	0.42170	0.42174	0.42929	0.47218	0.47649	0.44239
Adjusted R^2	0.26368	0.26410	0.26388	0.38394	0.38412	0.39013	0.43771	0.44244	0.40412

Note: *p<0.1; **p<0.05; ***p<0.01

Table 7: Number of papers on financial crisis (JEL Code: G01) by age group

	Young Male Professions	Young Female Professions	Experienced Male Professions	Experienced Male Professions
time	−0.00115	−0.00501	0.00918***	0.00839
	(0.00409)	(0.00973)	(0.00282)	(0.00824)
did	0.05348***	0.03726	0.08157***	0.05214**
	(0.01306)	(0.02550)	(0.00775)	(0.02421)
experience years	Yes	Yes	Yes	Yes
number of papers	Yes	Yes	Yes	Yes
number of coauthors	Yes	Yes	Yes	Yes
number of coauthors' papers	Yes	Yes	Yes	Yes
Observations	11,808	3,020	45,730	5,406
R^2	0.34698	0.26236	0.33284	0.33462
Adjusted R^2	0.29799	0.20352	0.29095	0.29136

Note: *p<0.1; **p<0.05; ***p<0.01

Table 8: Number of papers on financial crisis (JEL Code: G01) by author productivity

	High Productive Male Professions	High Productive Female Professions	Low Productive Male Professions	Low Productive Male Professions
time	0.00769***	0.00516	0.00209**	−0.00133
	(0.00281)	(0.00812)	(0.00103)	(0.00094)
did	0.07906***	0.05161***	−0.05264**	−0.02371
	(0.00685)	(0.01878)	(0.02146)	(0.05416)
experience years	Yes	Yes	Yes	Yes
number of papers	Yes	Yes	Yes	Yes
number of coauthors	Yes	Yes	Yes	Yes
number of coauthors' papers	Yes	Yes	Yes	Yes
Observations	48,679	6,500	8,859	1,926
R^2	0.33389	0.30442	0.66363	0.60954
Adjusted R^2	0.29073	0.25673	0.64076	0.57986

Note: *p<0.1; **p<0.05; ***p<0.01

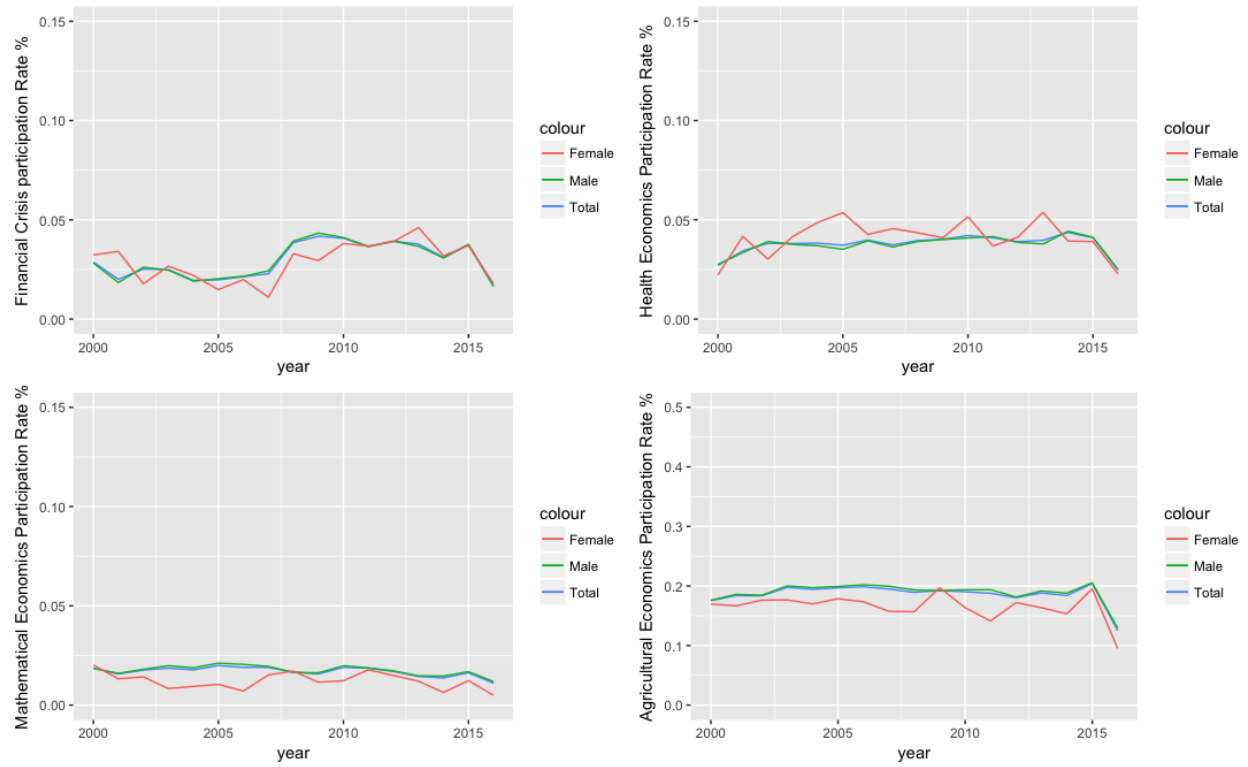Figure 1: Research fields participation rate comparison

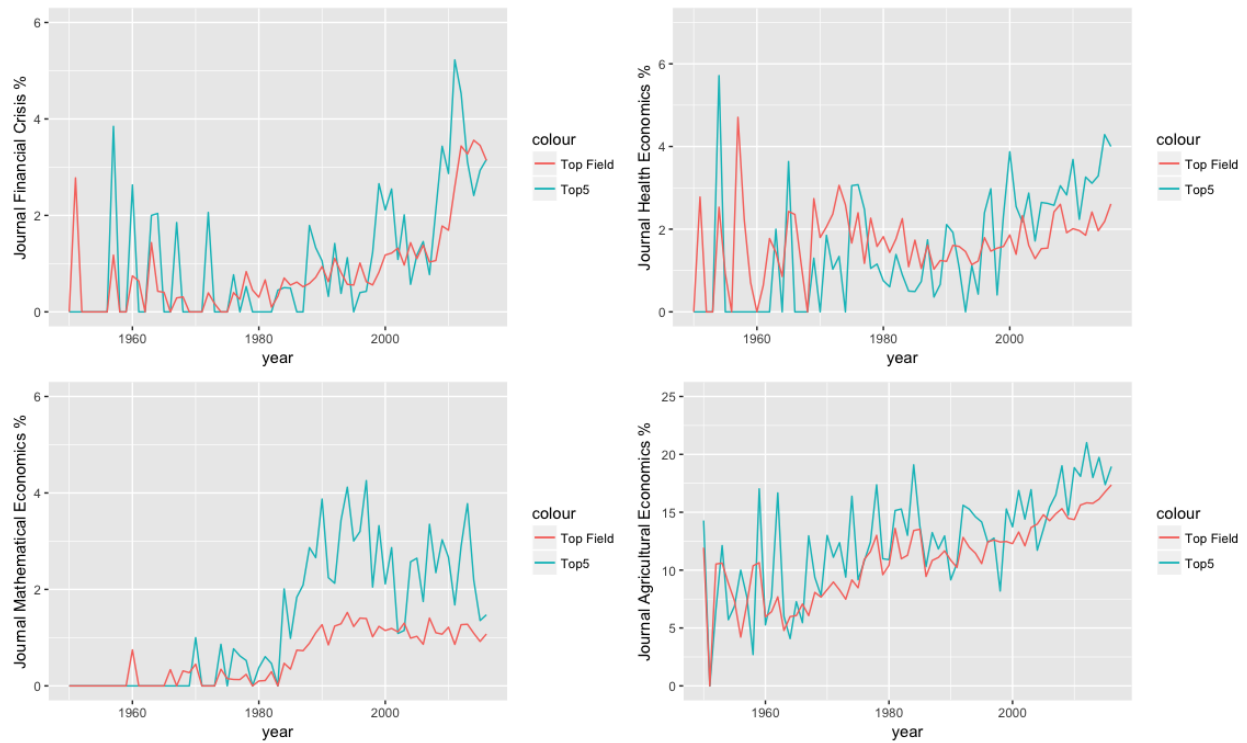Figure 2: Research fields composition in economics journals

Figure 3: Number of papers comparison for each research field

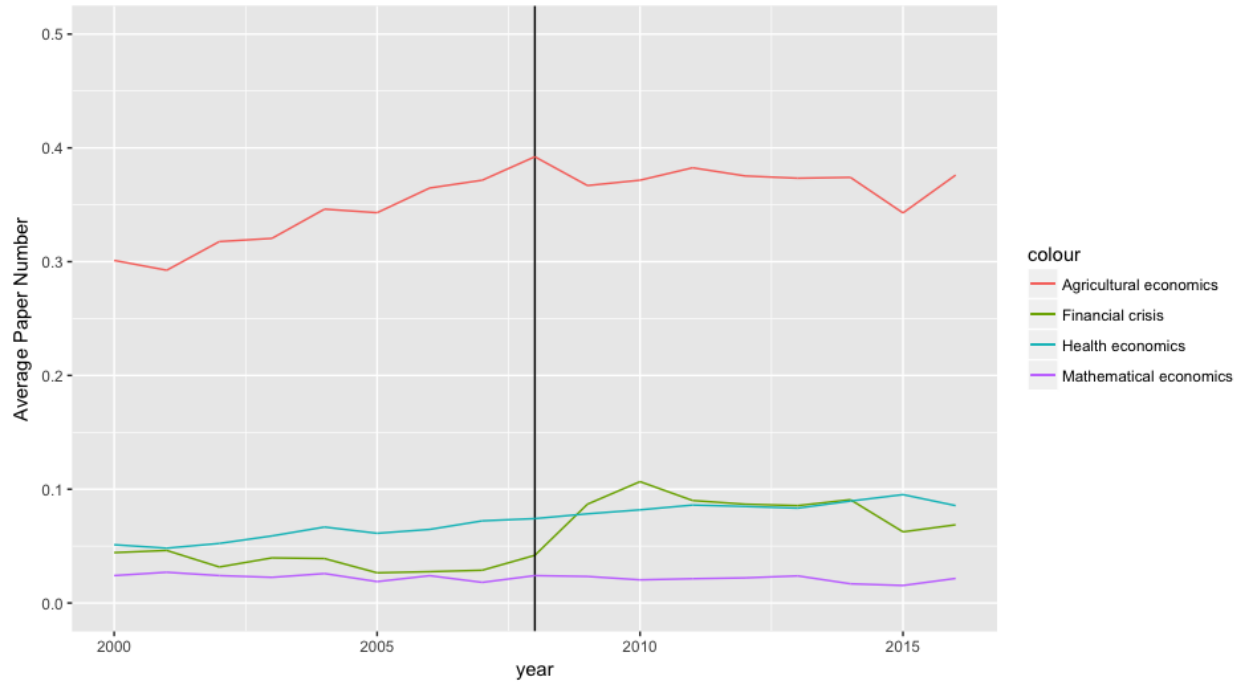Figure 4: Number of papers comparison for each research field

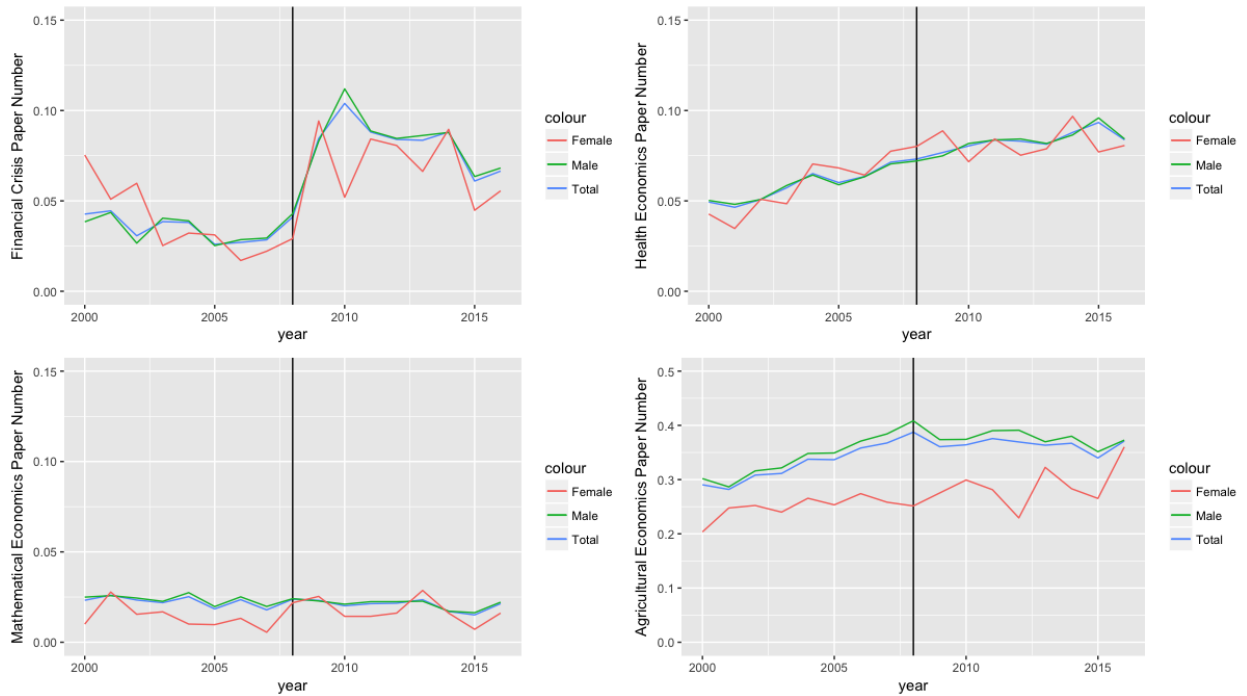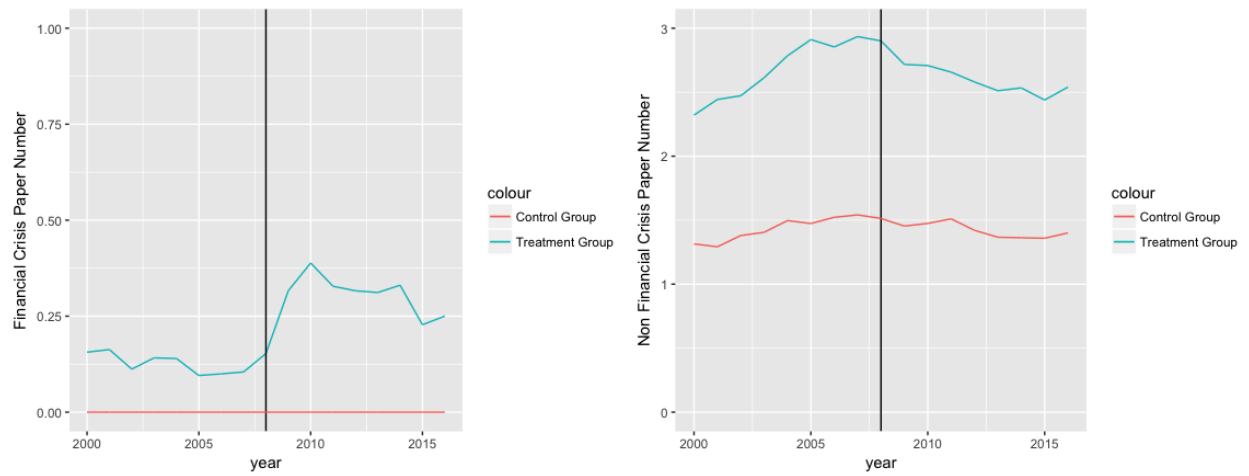Figure 5: Number of papers comparison for each research field

Figure 6: Number of papers comparison for each research field

A Textual Analysis Algorithms

A.1 Measuring author publication information

The steps of measuring author publication information:

1. Drop the publications without abstract from author a's publication list.[3]

2. Count citations by year for each of the remaining papers in a's publication list.

3. Tokenize titles of the remaining papers in author a's publication list, and standardize the unigrams in paper titles using Porter stemming algorithm.

4. Compare titles of the remaining papers in author a's publication list with each other, and check whether there exist multiple papers having "very similar" titles.[4]

5. Merge the papers with "very similar" titles in author a's publication list, and add up cumulative citations of these papers.

6. Calculate number of author's publications, number of author's top field publications, and number of author's top 5 publications by parsing journal information of the remaining papers.

7. Calculate author's yearly cumulative citations by adding up the yearly citations of the remaining papers.

A.2 Measuring publication information of author's co-authors

The steps of measuring publication information of author's co-authors:

1. Use author a's publication list to obtain a list of author a's co-authors, and calculate the number of co-authors of author a.[5]

2. Drop the publications without journal information and the publications without citations.[6]

---

[3]By going through the publication lists of some authors, I find the publications without abstract are usually book chapters, conference speeches, announcements, etc. These publications cause miscounting of the number of an author's publications.

[4]Papers with "very similar" titles in an author's publication list are almost sure to be different versions of the same paper in the academic database. If these paper are not merged, the number of papers by author a is falsely inflated. The algorithm to compare titles of papers uses function "SequenceMatcher" in Python module "difflib", and the smilarity ratio in "SequenceMatcher" is set as 0.8.

[5]The number of co-authors are counted in two ways – the "non-duplicated" way and the "duplicated" way. The "non-duplicated" way counts co-author who collaborates with the author in multiple papers within one year as one co-author. The "duplicated" way counts co-author who collaborates with the author in multiple papers within one year as multiple co-authors. The "non-duplicated" way indicates the extensiveness of the author's collaboration with co-authors, and the "duplicated" way indicates the intensiveness of the author's collaboration with co-authors.

[6]Due to the large amount of papers in the publication lists of co-authors, I drop the publications without journal information and the publications without citations to reduce the computational burden. A big portion of the publications without journal information and the publications without citations are not academic

3. Count citations by year for each of the remaining papers of each co-author's publication list.

4. Tokenize titles of the remaining papers in each co-author's publication list, and standardize the unigrams in paper titles using Porter stemming algorithm.

5. Compare titles of the remaining papers in each co-author's publication list with each other, and check whether there exist multiple papers having "very similar" titles.[7]

6. Merge the papers with "very similar" titles in each co-author's publication list, and add up cumulative citations of these papers.

7. Calculate the total number of publications, number of publications in top field journals in economics, and number of publications in the top 5 economics journals written by co-authors of author a.[8]

8. Calculate the total yearly cumulative citations of papers by co-authors of author a.

A.3 Measuring the research topics of a paper

The steps of measuring the topic words of a paper:

1. Use the keywords under two-digit JEL codes on American Economic Association website to get a dictionary of topic words by research field.[9]

2. Use "Sentence Segmentation" function of "NLTK" module (**?**) in Python to segment paper abstracts into sentences.

3. Use Porter stemming algorithm to standardize the keywords in each dictionary and paper abstracts, and tokenize paper abstracts to unigrams, bigrams, and trigrams.

4. Use the keywords dictionaries to parse the abstracts of papers published in the top 5 economics journals during 1990-2011, and count the frequency of each keywords in each research field.

5. Keep the top 50 frequent keywords under each research field, and use the constructed word lists to parse the abstract of each paper to create dummy variables for each identified

---

papers, which are not in the scope of this study.

[7]Papers with "very similar" titles in one author's publication list are almost sure to be different versions of the same paper in the academic database. If these paper are not merged, the number of papers by the co-author is falsely inflated. The algorithm to compare titles of papers uses function "SequenceMatcher" in Python module "difflib", and the smilarity ratio in "SequenceMatcher" is set as 0.8.

[8]The numbers of co-authors' publications are counted in two ways – the "cumulative" way and the "point" way. The "cumulative" way counts the number of each co-author's papers by the end of the year of the co-authorship. The "point" way only counts the number of papers written by co-authors in the year of the co-authorship. The "cumulative" way measures the "publication background" of the author's co-authors, and the "point" way measures the "activeness" of the author's co-authors.

[9]The keywords under field A (General Economics and Teaching), B (History of Economic Thought, Methodology, and Heterodox Approaches), N (Economic History), Y (Miscellaneous Categories), and Z (Other Special Topics) are excluded due to the small number of keywords under these codes.

research field.

6. Sum up each author's yearly number of publications in each research field.

B List of Top Fields Journals

Table 9: List of top-field journals

Journal Name	Journal Name
Econometrica	Journal of Economic Geography
Quarterly Journal of Economics	Journal of Marketing Research
the Review of Economic Studies	Journal of Time Series Analysis
Journal of Political Economy	Journal of Human Resources
Journal of Finance	World Bank Economic Review
Journal of Monetary Economics	Journal of Applied Econometrics
American Economic Review	Journal of Economic Behavior and Organization
Journal of Economic Theory	European Economic Review
Journal of Econometrics	Journal of Financial and Quantitative Analysis
Games and Economic Behavior	the Journal of Law and Economics
International Economic Review	Journal of Marketing
Journal of Financial Economics	Accounting Organizations and Society
Review of Financial Studies	Journal of Environmental Economics and Management
Journal of Economic Growth	Journal of Development Economics
Journal of International Economics	Economic Inquiry
the Review of Economics and Statistics	Financial Management
Journal of Labor Economics	Management Science
Journal of Business and Economic Statistics	International Journal of Forecasting
Journal of Public Economics	National Tax Journal
Economic Journal	Journal of Corporate Finance
Economic Theory	Industrial Relations
the RAND Journal of Economics	Journal of Urban Economics
Econometric Theory	Journal of Industrial Economics
Journal of Economic Dynamics and Control	Contemporary Accounting Research
Journal of Mathematical Economics	the Journal of Business
Journal of Risk and Uncertainty	Journal of the American Statistical Association
Journal of Money Credit and Banking	Explorations in Economic History
Marketing Science	the Scandinavian Journal of Economics
Accounting Review	Oxford Bulletin of Economics and Statistics
Review of Accounting Studies	Economica
Journal of Accounting Research	Oxford Economic Papers
Journal of Financial Intermediation	Canadian Journal of Economics
Review of Economic Dynamics	Journal of Comparative Economics
Macroeconomic Dynamics	International Journal of Industrial Organization
Journal of Financial Markets	Journal of Population Economics
Social Choice and Welfare	Economics Letters
Journal of Consumer Research	

C Robustness Check

Table 10: Distribution of robustness check group (percentage)

	Male	Female
Experience		
0-20 years	30.13	50.47
21-30 years	36.84	35.73
31-40 years	23.02	11.91
41+ years	10.02	1.89
Total	100	100
Productivity		
High productivity	84.24	76.56
Low productivity	15.76	23.44
Total	100	100

Table 11: Number of papers on stochastic and dynamic games, evolutionary games, and repeated games (JEL Code: C73)

	All Journals			Top Field Journals			Top 5 Journals		
	All	Male	Female	All	Male	Female	All	Male	Female
time	0.00482***	0.00430**	0.00796**	0.00153	0.00178	0.00003	0.00101	0.00095	0.00166
	(0.00170)	(0.00186)	(0.00391)	(0.00106)	(0.00118)	(0.00210)	(0.00065)	(0.00072)	(0.00142)
did	−0.01688**	−0.02032***	0.01580	−0.01588**	−0.01757**	0.00061	−0.00243	−0.00117	−0.01128
	(0.00751)	(0.00781)	(0.02752)	(0.00766)	(0.00809)	(0.02394)	(0.01084)	(0.01166)	(0.02968)
experience years	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
number of papers	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
number of coauthors	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
number of coauthors' papers	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Observations	65,964	57,538	8,426	65,964	57,538	8,426	65,964	57,538	8,426
R^2	0.01492	0.01490	0.01916	0.02065	0.02101	0.02404	0.02685	0.02900	0.02283
Adjusted R^2	-0.04940	-0.04918	-0.04814	-0.04330	-0.04267	-0.04293	-0.03669	-0.03416	-0.04422

Note: *p<0.1; **p<0.05; ***p<0.01

Table 12: Number of papers on analysis of health care markets (JEL Code: I11)

	All Journals			Top Field Journals			Top 5 Journals		
	All	Male	Female	All	Male	Female	All	Male	Female
time	−0.00641**	−0.00639**	−0.00509	0.00070	0.00071	0.00056	−0.00005	−0.00012	0.00034
	(0.00265)	(0.00287)	(0.00676)	(0.00110)	(0.00116)	(0.00344)	(0.00072)	(0.00076)	(0.00203)
did	0.03108***	0.03261***	0.01862	0.00571	0.00260	0.02374	−0.00193	−0.00825	0.03427
	(0.00584)	(0.00629)	(0.01499)	(0.00704)	(0.00752)	(0.01957)	(0.00924)	(0.00993)	(0.02394)
experience years	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
number of papers	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
number of coauthors	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
number of coauthors' papers	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Observations	65,964	57,538	8,426	65,964	57,538	8,426	65,964	57,538	8,426
R^2	0.06885	0.06917	0.07188	0.02173	0.02096	0.03398	0.02619	0.02593	0.04136
Adjusted R^2	0.00805	0.00862	0.00820	-0.04214	-0.04272	-0.03231	-0.03739	-0.03743	-0.02443

Note: *p<0.1; **p<0.05; ***p<0.01

Table 13: Number of papers on economic development: agriculture, and others. (JEL Code: O13)

	All Journals			Top Field Journals			Top 5 Journals		
	All	Male	Female	All	Male	Female	All	Male	Female
time	0.00829	0.00973*	0.00060	0.00620**	0.00648**	0.00524	0.00499***	0.00569***	0.00204
	(0.00524)	(0.00566)	(0.01376)	(0.00271)	(0.00295)	(0.00668)	(0.00145)	(0.00156)	(0.00384)
did	−0.00782	−0.00379	−0.03877***	−0.01240***	−0.01176***	−0.01742*	−0.01785***	−0.01614***	−0.03043***
	(0.00480)	(0.00516)	(0.01308)	(0.00350)	(0.00377)	(0.00940)	(0.00407)	(0.00441)	(0.01055)
experience years	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
number of papers	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
number of coauthors	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
number of coauthors' papers	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Observations	65,964	57,538	8,426	65,964	57,538	8,426	65,964	57,538	8,426
R^2	0.19624	0.19539	0.20804	0.15387	0.15494	0.14783	0.17450	0.17497	0.18145
Adjusted R^2	0.14376	0.14305	0.15369	0.09862	0.09997	0.08935	0.12060	0.12130	0.12528

Note: $^{*}p<0.1$; $^{**}p<0.05$; $^{***}p<0.01$

Table 14: Placebo test

	All Journals			Top Field Journals			Top 5 Journals		
	All	Male	Female	All	Male	Female	All	Male	Female
time	0.02734***	0.02853***	0.01888**	0.00257***	0.00250**	−0.00199	0.00082**	0.00104***	−0.00010
	(0.00287)	(0.00308)	(0.00824)	(0.00089)	(0.00100)	(0.00235)	(0.00036)	(0.00040)	(0.00064)
did	−0.00560	−0.00510	−0.01618	0.00018	−0.00046	0.01289	0.00139	0.00163	−0.00003
	(0.00571)	(0.00600)	(0.01918)	(0.00192)	(0.00173)	(0.01260)	(0.00112)	(0.00128)	(0.00042)
experience years	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
number of papers	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
number of coauthors	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
number of coauthors' papers	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Observations	65,964	57,538	8,426	65,964	57,538	8,426	65,964	57,538	8,426
R^2	0.32025	0.32608	0.29995	0.45465	0.55741	0.24989	0.73892	0.72928	0.84445
Adjusted R^2	0.27586	0.28225	0.25191	0.41904	0.52862	0.19842	0.72187	0.71167	0.83378

Note: $^{*}p<0.1$; $^{**}p<0.05$; $^{***}p<0.01$