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Research Evaluation of Financial Research – Evidence from a Survey

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Abstract

I explore the role of team collaboration in financial research based on a survey of conference participants. Precisely, I investigate whether various team and project characteristics are associated with research quality. The use of different quality proxies, i. e., normalized total citations, Journal Impact Factor, and publication success in top 10 finance journals, and the origin of the data allow me to not only analyse working papers spread throughout the entire quality spectrum but also to research new variables, e. g., team work quality and communication intensity. I document a positive relation between research quality and the following project characteristics: authors' scholarly capability, working paper's presentation at top tier conferences and research seminar series.

Keywords: Research Quality, Assessment of Research Quality, Survey, Citation Analysis, Research Collaboration

JEL Classification: G00

I. Introduction

Publication success has become more important for academics over the last years as it is used more frequently for merit, promotion, and tenure decisions (*Moore* et al. 2001; *Chan* et al. 2013). This development increased the pressure for academics to successfully publish high quality research. At the same time, successful publication in top journals has become more difficult due to a combination of the following reasons[1]. First, more extensive revision requirements applied by the journals result in a dramatic slowdown in the publication process

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[1] Results of the survey of finance conference participants reveal that 86.76 % (77.63 %) of all participants think that is has become more difficult to publish in the top 3 (top10) finance journals over the last five years. More information about the results of the survey of conference participants is available upon request.

(*Ellison* 2002), and lead to an increased time to market for research projects, i. e., the time required to publish a working paper in a journal (*Azar* 2007). Second, acceptance rates of leading conferences and journals decreased tremendously (C*ard/Della Vigna* 2013). To exemplify, acceptance rates at the annual meeting of the American Finance Association, were reported to be as low as 2.5 % (AFA 2007).

At the same time, previous research documents an enormous increase in co-authoring over the last decades (*Adams* et al. 2005). This development has been identified in various disciplines such as finance (*Holder* et al. 2000; *Brown* et al. 2011), economics (*Hudson* 1996; *Laband/Tollison* 2000), general business (*Manton/English* 2007), marketing (*Brown* et al. 2006), accounting (Brown 2005), management, and organization (*Acedo* et al. 2006). As some of these studies indicate a quality enhancement effect of co-authorship (*Laband/Tollison* 2000; *Brown* 2005; *Chung* et al. 2009), team collaboration seems to be one important adaptation factor of academics in the value chain of the publication process to face increased publication difficulty.

Therefore, by further exploring current characteristics of co-authorship in financial research, this study aims to investigate whether different team and project characteristics are associated with research quality. Using information obtained from a survey of finance conference participants, I am able to not only examine different team characteristics in more detail, but also to shed light on otherwise unobservable factors such as communication intensity and quality of team work. Interestingly, despite there is vast literature on team collaboration in academic research, only a few existing studies surveyed researchers directly. These studies mostly focus on (co-)authors perceptions and experiences of co-authoring in general, e. g., motivations for co-authoring (*Tompkins* et al. 1997; *Schinski* et al. 1998; *Holder* et al. 2000). In contrast, *Krapf* (2015) examines the effect of complementarity – measured by co-authors' age difference – on research quality. He documents that research collaborations are most efficient if the age difference between the authors is about 10 years.

However, the survey populations of most prior studies are largely limited, as they often only comprise authors who published in distinct journals (Holder et al. 2000), who are members of a certain finance association (*Schinski* et al. 1998), or who are randomly selected by using different academic databases such as Web of Science or EconLit (*Tompkins* et al. 1997; *Krapf* 2015; *Kumar/Ratnavelu* 2016). Additionally, those studies mainly focus on published journal articles, only. This limitation of using a small subset of the entire quality range of research output may lead to severe selection biases as these studies do not consider a representative working paper population by ignoring unpublished working papers (*Krapf* 2015). My study overcomes this shortcoming by surveying authors of working papers that were presented at 15 major international finance

conferences between 2007 and 2009. For that purpose, I analyse 945 conference papers written by 882 scholars from research institutions in 46 different countries. This enables me to include both published and unpublished research collaborations that are spread throughout the whole quality spectrum.

I examine the relationship between research quality and various team and project characteristics. The team characteristics include author number, mean age, gender diversity, affiliation diversity, communication intensity, team work quality, and author scholarly capability. The project characteristics are the number of conference presentations, the number of top tier conference presentations, and the number of research seminar presentations. Similar to other studies examining research output (*Medoff* 2003; *Chung* et al. 2009; *Krapf* 2015), I use different quality proxies to measure research quality. I apply normalized citations, i. e., the age-adjusted sum of citations a paper receives as working paper and published journal article, as main quality proxy to avoid age, publication, and journal biases (*Chan* et al. 2002; *Chan/Liano* 2009; *Pons-Novell/Tirado-Fabregat* 2010; *Moosa* 2011). Based on findings of previous studies (*Hollis* 2001; *Medoff* 2003; Hamermesh 2018), I additionally use normalized citations per author as modified measure of citation frequency to control for the number of authors. Finally, to further test the results' stability, I apply two alternative quality proxies: the Journal Impact Factor and publication success in top 10 finance journals.

The findings of this study can be summarized as follows: First, the number of working paper's presentations at research seminar series and the participation at top tier finance conferences are positively related with research quality, i. e., valuable feedback and extensive discussions obtained from other scholars seem to improve a paper's quality. Second, there is a significant positive relation between author's scholarly capability and research quality, i. e., researchers with a positive publication track record in top 10 finance journals produce higher quality research. In contrast, neither gender diversity, affiliation diversity, mean age, communication intensity nor team work quality seem to be associated with research quality. These findings are in line with previous studies from other fields of research which also document that demographic factors such as gender or age (van *Knippenberg/ Schippers* 2007; *Bell* et al. 2011; *van Dijk* et al. 2012), and affiliation diversity (*Stvilia* et al. 2011) have no significant influence on the quality of research output. Interestingly, the same holds true for team work quality indicating that researchers professionally cooperate even if they are not willing to work with the same team members in future research projects again. Furthermore, I document mixed results for multiple conference presentations and communication intensity as both characteristics are positively related with just one of the three different applied quality proxies. Finally, even though co-authored papers are cited more frequently, they are not associated with higher citations

per author. The latter is in line with previous studies of *Hollis* (2001), *Medoff* (2003), and *Hamermesh* (2018) who after discounting citations by the number of authors report no positive impact of co-authored papers on research quality measured via citation frequencies.

The remainder of the study is structured as follows: Section II introduces commonly used measures to assess research quality and discusses various team and project characteristics that are potentially correlated with research quality. Detailed information about the survey of conference participants is provided in section III. Section IV. describes the underlying econometric methodology and presents descriptive statistics. The empirical results of the relation between various characteristics and the different quality proxies are shown and discussed in section V. Finally, I conclude in section VI.

II. Research Quality and Characteristics Potentially Correlated with Research Quality

1. Assessment of Research Quality

The evaluation of research quality is crucial as hiring, tenure, and merit decisions for academics are commonly based on quality assessments of research output (*Chan* et al. 2013; *Coupé* 2013). There are two main approaches regularly used to assess research quality (*Currie/Pandher* 2011). The first approach measures paper quality based on the citation frequency of an individual article. Even though, citations are just one possible measure of academic productivity, they are a quantifiable and essentially market-based way of distinguishing among different participants in a particular academic enterprise (*Hamermesh* 2018). Citations are an arguably objective way of judging the research contributions of academics because they measure the long term impact of academic papers and thus, their intellectual value (*Laband* 1990; *Chan* et al. 2002; *Hamermesh/Schmidt* 2003). Citation-based analyses centered on articles are commonly based on citation indices such as the Social Science Citation Index (SSCI) or Scopus (*Borokhovich* et al. 2000; *Chung* et al. 2009; *Borokhovich* et al. 2011).

However, citation counts are imperfect measures as they suffer from several biases: First, the life cycle of citations has to be taken into account, i. e., citations observed at a moment too close to the date of publication will not necessarily offer a reasonable proxy of quality (*Abramo* et al. 2010). Second, there are systematic differences in citation frequencies among various (sub-)fields of research (*Hamermesh* 2018). Additionally, citations can be manipulated through self-citations, they include 'negative' citations, and authors can cite selectively by only referring to works of their friends (*Coupé* 2013).

For the second approach, I measure the research quality using the quality of its outlet (*Hamermesh* 2018; *Kerl* et al. 2018). A widely used proxy for a journal's quality is the Journal Impact Factor (JIF) published by Thomson Reuters (formerly Institute of Scientific Information, ISI). The JIF is a bibliometric index reflecting the average number of citations articles published in a specific journal received during a certain period of time. The JIF may be more useful, in terms of helping someone form more accurate expectations of the quality of a given article published in a journal, than the information provided by citations per article, only (*Laband* 2013). However, numerous and authoritative works in the literature warn against the risks in using this indicator, related to a series of evident limitations and biases (*Abramo* et al. 2010).

In addition to this citation-based approach, several other journal rankings have emerged (*Harzing* 2016). Journal rankings are often based on peer-reviewed (or survey-based) perception studies evaluating journals quality based on the opinions of a predetermined group of experts. This 'reputation' might be based on the perceptions of a set of individuals who may or may not be very knowledgeable, or it might be based on factual information about the papers published previously in that journal (*Laband* 2013). Even though, peer review is the most widely used performance evaluation mechanism in academia (*Coupé* 2013), the tremendous heterogeneity of individual contributions published in the same outlet makes attributing journals' average quality to the individual articles they published extremely error-prone (*Hamermesh* 2018).

Since survey-based judgments might suffer from 'subjective' perceptions, non-responding, and sampling biases (*Chan/Liano* 2009; *Moosa* 2011; *Coupé* 2013), some studies extend their analyses to avoid these biases (*Oltheten* et al. 2005; *Currie/Pandher* 2011) or develop alternative ranking approaches, e. g., *Beattie/Goodacre* (2006) use submissions to the U.K. Research Assessment Exercise as ranking input.

As the discussion about the use of different proxies to measure research quality has shown, one is not able to say conclusively which of these measures is the correct one (*Coupé* 2013). However, good sense and common agreement is that citations are preferable, and there is a rich literature in favor of this assertion (*Abramo* et al. 2010). Citations present an implicit market test, namely whether the scholarly contribution affected the subsequent research of other scholars, thus, they may be better indicators of the quality of a person's scholarly work than numbers of publications or the kinds of outlets where the research appeared (*Hamermesh* 2018). Therefore, in this study normalized, i. e., age-adjusted, citations are used as main proxy for research quality.

Even though some studies indicate that the various quality proxies are positively correlated (*Laband* 1990; *Kerl* et al. 2018), other studies document interesting discrepancies. *Laband/Tollison* (2003) by focusing on published journal

articles show that there are a lot of 'dry holes', papers that were published but never cited. In contrast, *Gans/Shephard* (1994) provide various examples of initially rejected papers which later turned out to be very influencing articles by means of citations. Lastly, by investigating 'best paper awards' *Coupé* (2013) finds that the winning papers based on peer reviewed evaluations are rarely the most cited papers. Consequently, to investigate results' stability alternative quality proxies such as the Journal Impact Factor and publication success in top 10 finance journals are applied as robustness checks in section V.

2. Team and Project Characteristics Potentially Related with Research Quality

a) Co-Authorship

Already in 1983, McDowell/Melvin noticed a strong increase in co-authorship. The advances in communication technology have even facilitated and accelerated this trend (*Bielinska-Kwapisz* 2012). Nowadays, most research papers are co-authored[2]. Previous research identified three main motivational factors for co-authorship (Barnett et al. 1988; *Medoff* 2003; *Manton/English* 2007; *Chung* et al. 2009). First, team work is believed to advance research quality due to blending of complementary skills (*Holder* et al. 2000). Second, publication success may not solely driven by quality of the research output but also by network effects, i. e., affiliation or editor relationships (*Acedo* et al. 2006; *Franceschet/Costantini* 2010; *Besancenot* et al. 2017). Third, the desire to diversify and thereby to increase publication probability due to an increased number of journal submissions via co-authoring (*Holder* et al. 2000). More recently, *Fahn/Hakenes* (2019) developed a theoretical approach showing that team formation can also serve as an implicit commitment device to overcome problems of self-control.

Whereas the motives for co-authorship are commonly accepted, the effect on research quality is less clear as previous empirical research reveals some contradictory results. In an extensive study covering a variety of different academic disciplines, *Wuchty* et al. (2007) find that team collaborations are not only more frequently cited but also produce the exceptionally high impact research. The majority of studies document a significant positive impact of research teams on the quality of research output in the field of finance and economics (*Laband/Tollison* 2000; *Glänzel* 2002; *Brown* 2005; *Acedo* et al. 2006; *Chan* et al. 2009; *Chung* et al. 2009; *Bosquet/Combes* 2013; *Levitt* 2015). However, some studies do not report such a positive effect of co-authorship, especially after controlling for

[2] As described in section IV., the survey of finance researchers reveals that 88 % of the working papers in the sample are co-authored. At the same time, 77.07 % of all survey participants co-authored 80 % to 100 % of their research projects.

self-citations (*Medoff* 2003) or author numbers, i. e., fractional citation counts (*Hollis* 2001; *Lee/Bozeman* 2005; *Ductor* 2015; *Hamermesh* 2018).

b) Team Diversity Characteristics

As discussed above, some of the existing studies find a positive effect of co-authorship on research quality. To obtain further insights in team characteristics, it is important to study team diversity characteristics in more detail. In general, team diversity is categorized into bio-demographic diversity on the one hand, i. e., race, ethnicity, gender, or age, and cognitive resource diversity on the other hand, i. e., differences in values and beliefs, or personality differences (*Mannix/Neale* 2005; *van Dijk* et al. 2012). With respect to bio-demographic diversity characteristics, the findings of previous studies are not unambiguous. Whereas some researchers document a positive effect of more homogeneous teams (*Jackson* et al. 2003), other studies state that demographic factors such as gender or age have no significant negative influence on output (*van Knippenberg/Schippers* 2007; *Bell* et al. 2011; *van Dijk* et al. 2012). In contrast, in a recent study *Ghosh/Liu* (2020) argue that the given institutional gender bias leads to disadvantageous team matching for women resulting in fewer publications in top 20 economics journals compared to men.

On the other hand, cognitive resource diversity often measured via task- or job-related diversity is reported to positively influence team performance as it leads to a larger pool of information, skills, tools, and networks which enables team members to be more creative and innovative (*Jackson* et al. 2003; *Mannix/Neale* 2005; *Bell* et al. 2011). Exemplary, *Krapf* (2015) uses age difference of co-authors to proxy complementarity and finds an age difference of ten years to increase research productivity.

Despite the vast literature on the impact of diversity on team performance, only few studies investigate the effect of both research teams' bio-demographic and cognitive resource diversity on paper quality at the same time. *Stvilia* et al. (2011) show that seniority diversity has a significant negative effect on the quantity of peer-reviewed articles in the field of biology, chemistry, physics, and material science. At the same time, they do not find a statistically significant effect of neither gender nor affiliation diversity. However, the study of *Hinnant* et al. (2012) reveals insignificant impacts of both affiliation and seniority diversity for papers published in Physical Review Letters. In contrast, *Saá-Pérez* et al. (2017) report a significant positive impact of both gender and affiliation diversity on the number of published articles. To conclude, previous researches document diverging effects of team diversity on research quality (*Webber/Donahue* 2001; *Jackson* et al. 2003; *Horwitz/Horwitz* 2007).

In addition to the team diversity variables discussed above, I draw on the survey of conference participants and consider team variables that were not studied yet. First, following *Gruenfeld* et al. (1996) who argue that information exchange frequency plays an important role for the generation of new knowledge, I incorporate a variable measuring the teams' communication intensity. Second, as *Hoegl/Gemuenden* (2001) discuss the impact of the overall quality of teamwork on the success of the team project, I also include a variable measuring the overall satisfaction with the team collaboration.

c) Other Project Characteristics

Research quality is certainly not exclusively affected by the number of authors and the composition of the research team, thus, additional characteristics have to be considered. Probably the most intuitive factor is author's scholarly capability or quality. Obviously, more capable researchers should be able to write papers of high quality which in turn should be especially successful in the reviewing process. Although, *Brown* (2005) does not find a significant impact of author's scholarly capability on output quality, most studies report such a positive impact (*Medoff* 2003; *Chung* et al. 2009).

Additionally, some more project characteristics are possibly associated with research quality. First, the employed methodology of the paper, e. g., theoretical or empirical, might affect the impact or quality of an article (*Benedetto* et al. 2016). But previous research indicates that the effect is not statistically significant (*Chung* et al. 2009). One exception is the study of *Walter* (2011) who reports a quality-reducing effect of empirical papers focusing on German data in financial research. Second, a few studies also investigate the impact of a working paper's presentation at research seminar series and conferences on research quality. *Brown* (2005) documents a positive effect for research seminar series presentation but not for conference participation. This result is confirmed by *Bielinska-Kwapisz* (2012) who also report an insignificant impact of conference presentation. However, as this study's survey results reveal that the average working paper is presented on 2.42 conferences before publication[3], conference presentation might play an important role in the value chain of the publication process. This reasoning is confirmed by two recent studies focusing on quality differences of international finance conferences (*Reinartz/Urban* 2017; *Kerl* et al. 2018). Both studies document the existence of huge quality differences between major international finance conferences. Therefore, I not only study the effect of research seminar series presentation but also control for conference

[3] For more details see section IV. 3. *Descriptive statistics*.

presentation frequency, and quality of the conference on which the working paper was presented.

III. Survey of Conference Participants

1. Data and Data Collection Process

Most of the existing studies analysing determinants of research quality are biased towards a specific set of journals, published articles, or authors (*Holder* et al. 2000; *Laband/Tollison* 2000; *Brown* 2005; *Chung* et al. 2009). Thanks to the unique database, I avoid these biases due to the following reasons: The data stems from the authors of the papers directly, contains published and unpublished working papers that were presented at different international finance conferences, so that the data has a global reach, and covers journals from the entire quality range. Additionally, next to personal information about the authors and their co-authors, I also obtain information about the quality and intensity of research collaboration that would not be observable otherwise by asking the authors directly.

The underlying data stems from a survey of finance conference participants. The conference universe of 15 international finance conferences is the result of a selection process based on four criteria. First, I focus on general finance conferences, i. e., topics of conference papers must not be restricted to a specific sub field. Second, the conferences must not be restricted to an exclusive audience, i. e., there must be a public Call for Papers enabling all interested researchers to submit their papers. Third, the conferences must be held on a regular basis, e. g., annually. Consequently, I do not incorporate conferences initiated for a special and unique incident only. Fourth, the conference programs must be available to enable me to collect and document the presented conference papers. These selection criteria result in the identification of the annual meetings of the following finance associations: American Finance Association (AFA), Australasian Finance and Banking Conference (AFBC), Eastern Finance Association (Eastern FA), European Finance Association (EFA), European Financial Management Association (EFMA), French Finance Association (FFA), Financial Management Association (FMA), Financial Management Association Europe (FMAE), German Finance Association (GFA), Midwest Finance Association (MFA), Northern Finance Association (NFA), Southern Finance Association (SFA), Swiss Society for Financial Market Research (SSFMR), Southwestern Finance Association (SWFA), and Western Finance Association (WFA). As every working paper which was presented at one of the above mentioned conferences between 2007 and 2009 was collected, the entire data set contains 9,679 working papers[4].

[4] The number of presented conference papers strongly varies between conferences with the FMA being by far the largest conference with, on average, approximately 776

In a second step, for each conference paper the following information was extracted: working paper's title, conference, year of presentation, name, and email address of all co-author(s). Based on this information, for each individual (co-) author I then identified all conference papers written by this author either as single or co-author[5]. For each author I collate all working papers presented at one of the above mentioned conferences in the observation period. This unique data set enabled me to create a questionnaire investigating characteristics of team collaboration in more detail by directly asking authors about the specific research project on an individual working paper level. Therefore, I am able to shed light on otherwise unobservable information and characteristics potentially correlated with research quality.

As a result, the data set contains 7,559 different (co-)authors whose research was presented at least at one of the 15 conferences during the observation period. Interestingly, the number of conference papers presented at the above mentioned conferences exceeds the number of (co-)authors due to the following reasons. First, in financial research it is common practice to present articles at different conferences in the same or subsequent years. In the sample, approximately 31 % of all articles have been presented at two or more conferences[6]. Second, for many of the researchers the data set also contains more than one working paper because different working papers of the same author were presented at the underlying conferences. Exemplary, the author with the highest number of working papers in the data set has 24 conference papers in the observation period including multiple conference presentation, i. e., working papers that have been presented at more than one conference.

The survey was conducted using the professional survey software from Exavo, a service provider specialized on online surveys. On January 30th 2016, the respondents were contacted via the email address obtained from the conference paper she or her co-authors has been presenting at one of the above mentioned conferences. The respondents received an invitation email and were asked to participate in the anonymous online survey. The first reminder was sent on

presented papers per year. On the other end of the scale, the conference program of the FFA only contains approximately 49 articles per year on average. More detailed information about the underlying conferences such as average number of conference papers per conference is available upon request.

[5] As the aim of this study is to analyse research collaboration, I collected all co-authors, regardless of whether they have been personally presenting the working paper at the conference or not.

[6] To identify multiple conference presentations, the titles of all conference papers are compared. Only those conference papers having identical titles are counted as multiple presentations. Since articles occasionally change their names during the publication process (*Walter* 2011), the estimate of multiple conference presentation indicates the lower bound.

3rd March 2016, the final reminder to participate in the survey was sent on 21st March 2016. Finally, the survey was closed on 15th April 2016.

The survey was structured into different parts. First, the questionnaire assessed the respondent's demographic characteristics (year of birth, sex, country of origin, mother tongue), information about their academic position (current position, country of current affiliation) as well as their research experience and publication success (experience as editor and referee, publication track record). In the second part of the survey, the respondents were asked several questions about their own conference papers. In that vein, respondents were requested to provide information for each individual working paper they have written as single or co-author. The questionnaire contains a loop, so authors who wrote more than one working paper, were asked to provide the required information for each individual working paper, separately. However, to limit the required amount of time necessary to complete the questionnaire, the number of working papers, the authors were asked to provide information on, was restricted to three working papers per author. If the database contains more than three single or co-authored working papers of a specific author, three working papers were randomly selected. The information required covers three different areas: First, respondents should provide some general information about their co-author(s), if applicable. This information contains demographic characteristics (age, sex, country of origin, mother tongue) and information about the academic position of each co-author (academic position, country of affiliation) at the time they worked on the underlying working paper. This information is used to investigate effects of different team characteristics on research quality in more detail. Second, if the underlying working paper was co-authored, respondents were additionally asked several questions about the individual research collaboration (communication intensity during the research project, overall quality of cooperation). Finally, the questionnaire assessed some general project characteristics of the individual working paper such as publication success, methodological approach, conference and research seminar presentation history (frequency of conference and research seminar presentations, names of conferences)[7].

[7] Furthermore, the survey contains some more general questions about financial research, e. g., the perceived change in difficulty to publish research over time, the change in time spent on research, and questions aiming to rank 15 major international finance conferences. However, as this information is not used in this study the answers to these questions are not presented or discussed in this paper. The entire questionnaire as well as the answers to all questions are available upon request.

2. Descriptive Statistics of Survey Participants

From the 7,559 originally sent emails, 2,408 were returned as non-deliverable or generated an automated vacation message. The comparatively high number of non-deliverable emails might be explained by the long time lag between the point of time the conference papers were originally presented, i. e., between 2007 and 2009, and the start of the survey, i. e., January 2016. Therefore, many of the collected email addresses were probably out of date or have changed due to fluctuations and job changes. 5,151 emails were delivered successfully. After closing the survey, 882 academics from research institutions in 46 different countries followed the invitation to participate in the survey. This translates into a participation rate of roughly 17.12 %, which is comparable to other surveys in financial research (*Schinski* et al. 1998; *Holder* et al. 2000). The survey contained up to three conference papers per author, therefore, the number of processed working papers exceeds the number of participating respondents. In total, respondents answered questions on 945 different working papers[8].

Table 1

Survey of Conference Participants – Summary Statistics

Panel A: General Information		
	# Responses	Mean
Total Survey Participants	882	
# Conf Part p. a.	324	2.56
Age (Years)	529	50.07
Sex (0 = Male, 1 = Female)	530	19.25 %
Panel B: Current Position		
	# Responses	Responses (%)
Total respondents	558	
Full Professor	242	43.37 %
Associate Professor	181	32.44 %
Assistant Professor	85	15.23 %
Other (i. e., practitioner)	50	8.96 %

[8] However, some participants did not provide information on all questions asked in the survey, which reduces the available data for the empirical analyses provided in section VI.

Panel C: Location of Current Affiliation – Top 3 Regions

	# Responses	Responses (%)
Total Respondents	547	
North America	229	41.86%
Europe	199	36.38%
Australasia	69	12.61%

Panel D: Research Experience

	Top3			**Top10**		
Experience	Yes	No	# Responses	Yes	No	# Responses
Editor	3.25%	96.75%	431	9.15%	90.85%	437
Referee	35.04%	64.96%	468	73.99%	26.01%	496
# Publications (Mean)	1.16		474	3.01		503

Notes: This table presents the summary statistics of the survey of conference participants. Information about survey participants is obtained by analysing the conference papers presented at 15 international finance conferences between 2007 and 2009. The survey was conducted between January and April 2016. Panel A reports some general information on conference participants. For each characteristic listed in the first column, the number of responses and the mean value of all responses are shown in the second and third column, respectively. *# Conf Part p. a.* is the number of conference participations per annum. Panel B and C present further information on the current position and location of current affiliations of survey participants. The percentage share for each of the categories based on the number of total respondents (column 2) is reported in the third column. Panel D documents information about the research experience of survey respondents. Research experience is measured by editor, referee, and publication experience in top 3 and top 10 finance journals, respectively. The definitions of the top 3 and top 10 finance journals refer to the ranking scores of the JIF obtained from the Journal Citation Reports (JCR). *# Publications* (Mean) measures the mean number of publications in top 3 and top 10 finance journals per respondent, respectively, based on information provided by conference participants.

Table 1 shows selected summary statistics of survey participants. On average, respondents are 51.07 years of age, male (80.75% of the participants are men), and attend on average 2.56 finance conferences per annum (Panel A). 43.37% of the participants currently hold full professorships. Nearly one in two respondents are either associate or assistant professors (Panel B). The regional distribution of survey participants largely mirrors the conference universe and includes respondents from 46 different countries. The top 3 regions of participants' current affiliations are North America (41.86%), Europe (36.38%), and Australia and Asia (12.61%) (Panel C). In addition, Panel D reports information on the research experience of the survey participants. On average, conference participants have published 1.16 (3.01) in the top 3 (top 10) finance jour-

nals[9]. Additionally, 35.04 % (73.99 %) of the respondents currently serve or have served as referees for one of the top 3 (top 10) finance journals, and 3.25 % (9.15 %) have served as editors for one of the top 3 (top 10) finance journals, respectively. At the first glance, based on the different characteristics described above survey respondents seem to be a good representative cross section of the average finance researcher.

3. Testing for Selective Response

To further investigate whether the data obtained in the survey is sufficiently representative of finance researchers, I study the characteristics of the papers whose authors participated in the survey in more detail. However, this analysis is not trivial as most of the characteristics provided by survey participants are not observable or not available. This is especially true for data of the different team and project characteristics. For example, the exact geographic distribution of authors of the basic population is not known. Similarly, more detailed information about co-authors' characteristics and team collaboration properties is not existent for the basic population. Hence, the test for selective response focuses on variables that were already collected for the basic population as well. These variables include the proxies to measure research quality. First, the papers whose authors participated in the survey receive on average 4.11 normalized citations (see also section *IV. 1. Descriptive statistics* for more details on the data used in the analysis). In contrast, the remaining papers in the basic population whose authors did not participate in the survey have mean normalized citations of 4.38. The comparison of the alternative quality proxies reveals similar results. The average JIF score for papers whose authors participated in the survey is 2.16, whereas the mean JIF score for the remaining papers of the basic population is 1.97. Furthermore, the average publication ratios in top 10 finance journals are 16 % for the papers of participating authors and 13 % for the remaining papers in the basic population, respectively. The mean values of the papers of participating authors are very similar to the corresponding values of the remaining papers of the basic population for all three determinants used to proxy research quality. Therefore, the survey data indeed seems to be a very good representative cross section of the average working paper in the basic population.

[9] For the purposes of the questionnaire, to define top 3 and top 10 finance journals, I refer to the ranking scores of the 5-Year Journal Impact Factors (JIF) obtained from the Journal Citation Reports (JCR).

IV. Methodology and Descriptive Statistics

1. Methodological Approach to Analyse the Relation Between Research Quality and Various Team and Project Characteristics

The main aim of this study is to further explore current characteristics of co-authorship in financial research on the one hand, and to investigate whether different team and project characteristics are associated with research quality on the other hand. As described above, there are various approaches to assess an article's quality (see section *II.1. Assessment of research quali*ty for more details). To avoid the disadvantages associated with each of the different measures, this study applies different quality proxies. First, citation frequencies of individual articles are used as citations directly measure a paper's quality[10]. Today, the two most commonly used online methods of acquiring citation counts to a scholarly work or to a person's works are the Web of Science, created by the Institute for Scientific Information, and Google Scholar (*Hamermesh* 2018)[11]. Whereas Web of Science focuses on published papers, only, Google Scholar also measures citations of unpublished working papers. Even though, *Hamermesh* (2018) reports a high correlation between rankings based on citations frequencies obtained from Google Scholar and Web of Science, in this study, similar to *Keloharj* (2008), citation frequencies obtained from Google Scholar are used as I consider both published and unpublished working papers. To mitigate the age of an article, I use normalized (age-adjusted) citations. For instance, an article that receives 50 citations and that was published five years ago has a normalized citation number of 10 (for a similar approach, see *Chan* et al. 2013). Therefore, in this study normalized citations are defined as sum of the age-adjusted number of citations that an individual paper receives either as unpublished working paper or as published journal article. Thereby, potential age and journal biases are avoided.

Based on findings of previous studies (*Hollis* 2001; *Medoff* 2003; *Hamermesh* 2018), I also use normalized citations per author as modified measure of citation frequency to control for author number. To further investigate results' stability, alternative quality proxies such as the Journal Impact Factor (JIF) and publication success in top 10 finance journals are applied in further analyses. To obtain the different quality proxies mentioned above for of all the 9,679 working papers in the basic population, I manually track the publication success, i. e., the

[10] See section II. *1 Assessment of research quali*ty for a discussion of the different proxies to measure research quality.

[11] However, there are other less frequently employed literature databases such as Business Source Premier, Microsoft Academic Search, Elsevier Scopus, or EconLit.

journal outlet in case of successful publication, and citations frequencies of all papers as of the end of February 2017.

This study uses different quality proxies to investigate a potentially existing relation of various variables with research quality. These variables can be divided into two groups: team and project characteristics. The investigated team characteristics include team size, i. e., number of authors, and typical team diversity characteristics such as age, gender heterogeneity, and affiliation diversity. Furthermore, thanks to the unique database obtained from the survey of conference participants, I am able to also draw on additional information about quality and intensity of the research collaboration that would not have been measurable otherwise (see section *III. Survey of conference participants* for more information). In contrast, the investigated project characteristics include the number of conference and research seminar series presentations of the underlying working paper. Table 2 provides a detailed description of these team and project characteristics potentially related with research quality.

Table 2

Overview of Analysed Team and Project Characteristics

Group	Characteristic	Description
Team characteristics	**Team**	A dummy variable that equals one if the paper is written by a team of researchers, and zero otherwise.
	# Authors	Author number measures the number of authors of the working paper, i. e., the team size.
	Ø Age	Mean age measures the mean age of the research team.
	Gender Diversity	A dummy variable that equals one if the working paper is written by a team of researchers and at least one of the team members is female, and zero otherwise.
	Aff Diversity	A dummy variable that equals one if the working paper is written by a team of researchers and at least one of the team members was located at a different affiliation than the remaining team members, and zero otherwise.
	Comm Intensity	A dummy variable that equals one if the working paper was written by a team of researchers and the team exchanged information frequently, i. e., at least once a week, and zero otherwise, i. e., information exchange less than once a week.

	Team Work Quality	A dummy variable that equals one if the members of the research team have been satisfied with the team work and would like to cooperate with the same team members on future research projects, and zero otherwise.
Project characteristics	**Author Quality**	This variable measures the quality or experience of the author of a working paper. An author's quality is measured by the number of articles the author has been published in one of the top 10 finance journals.
	Multiple Conf Pres	A dummy variable that equals one if the working paper has been presented at two or more conferences, and zero otherwise.
	Top Tier Conf Pres	A dummy variable that equals one if the working paper has been presented at one of the top tier finance conferences at least once, and zero otherwise. Following Kerl et al. (2018), top tier finance conferences are defined as the annual meetings of the American Finance Association, the Western Finance Association, and the European Finance Association.
	# Research Seminars	Number of research seminar presentations of the underlying working paper.

Note: This table presents the analysed team and project characteristics potentially related with research quality.

Some of the above mentioned characteristics might be endogenously determined. Endogeneity issues arise because of unobserved heterogeneity in the data, possibly stemming from unobserved characteristics, which implies that the dependent variable is correlated with some regressors (*Besancenot* et al. 2017). The existence of endogeneity would be an econometric problem: If some of the underlying variables are endogenously determined and if this bias would be ignored, the effects of the endogenously determined variables would be incorrectly attributed and biased coefficients would be obtained (*Ductor* 2015).

One variable which might be endogenously determined is co-authorship formation. For example, an author may choose to collaborate because some ideas are hard to tackle individually or because she prefers to work with authors that have similar characteristics or intellectual skills (*Ductor* 2015). Another potentially affected characteristic is the author's scholarly capability. There might be endogeneity in individual productivity relative to the quality of co-authors, i. e., an author's quality is interlinked with the quality of her co-authors.

The most common framework for addressing the problem of endogeneity are instrumental variables (IV) methods. Efficient instruments must meet two conditions: First, they should be highly correlated with the potentially endogenously determined explanatory variable. Second, they should be uncorrelated with the error term. With respect to co-authorship formation, Lee and *Bozeman* (2005) were the first to deal with the endogeneity problem by instrumenting co-authorship using a 'cosmopolitan scale' that ranges from zero to five depending on the location of the co-author. However, there is a potential correlation between the instruments and productivity, as links with international colleagues will provide access to new ideas and resources (*Ductor* 2015). In a more recent study, *Ductor* (2015) instruments the amount of co-authorship by the common research interest between an author and her potential co-authors. To deal with endogeneity in individual quality relative to the quality of co-authors, *Besancenot* et al. (2017) use the best quality single authored paper of an author.

However, similar to most of the existing studies and due to data constraints, in this study it is assumed that all explanatory variables are exogenously determined – or for some reasons which are not correlated with research quality. At the same time, I avoid to infer directions of causalities with respect to the documented relations between research quality and the different team and project characteristics because I am not able to certainly exclude the existence of endogeneity.

2. Econometric Model

As described above, normalized citations are used to proxy research quality. Normalized citations are (non-negative) count data and are commonly analysed with Poisson regression models. The Poisson probability distribution is defined as (*Hilbe* 2011):

$$P(y_i) = \frac{exp^{(-\lambda)} \lambda_i^{y_i}}{y_i!}, \tag{1}$$

where $P(y_i)$ is the probability of paper i receiving y_i normalized citations, and λ_i is the mean of normalized citations, $E(y_i)$. In the Poisson regression model, $E(y_i)$ is estimated with the following equation:

$$\lambda_i = E(y_i) = e^{\beta_0 + \beta_1 X_i}, \tag{2}$$

where X_i is a vector comprising the various explanatory variables, i. e., the different team and project characteristics presented in the previous section, β_0 is

the intercept, and β_1 is the vector of regression coefficients to be estimated with the standard maximum likelihood method.

One important prerequisite to use the Poisson distribution as underlying estimation method is that the variance equals the mean of the distribution, i. e., $E(y_i) = VAR(y_i)$. However, if $E(y_i) > VAR(y_i)$, the data is under-dispersed, and if $E(y_i) < VAR(y_i)$, the data is over-dispersed, respectively. Applying the Poisson regression in these scenarios would lead to biased estimations of standard errors and test statistics. To overcome this problem, the negative binomial regression model should be used as alternative estimation method as it introduces an extra parameter to control for the over-dispersion (*Hardin/Hilbe* 2007). Therefore, equation (2) changes to

$$\lambda_i = E(y_i) = e^{\beta_0 + \beta_1 X_i + \in_i}, \tag{3}$$

where $\in_i$ is a gamma-distributed error term with mean one and variance α^2. Then, the variance is defined as

$$VAR(y_i) = E(y_i) + \alpha E(y)^2, \tag{4}$$

where α indicates over-dispersion or under-dispersion, respectively. To test for potential dispersion in the data, I apply a goodness-of-fit statistic and find α to be significantly different from zero, thus, the data does not follow a Poisson regression. As the variance of the response, i. e., normalized citations, is larger than the mean of the response, the underlying data is over-dispersed. Consequently, instead of the Poisson regression, I apply the negative binomial regression model[12]. The probability distribution of the negative binomial regression is given as

$$P(y_i) = \frac{e^{(-\lambda_i)^{\in_i}} \left(\lambda_i e^{\varepsilon_i}\right)^{y_i}}{y_i!}. \tag{5}$$

The negative binomial model integrating $\dot{o}_i$ then takes the following form (*Long* 1997):

$$P(y_i) = \left(\frac{1/\alpha}{(1/\alpha)+\lambda_i}\right)^{(1/\alpha)} \left(\frac{\lambda_i}{(1/\alpha)+\lambda_i}\right)^{y_i} \frac{\gamma((1/\alpha)+y_i!)}{\gamma(1/\alpha)\, y_i!}, \tag{6}$$

where γ(.) is a gamma function. The standard maximum likelihood method is used to estimate the negative binomial model:

[12] For a similar approach, see *Brown* (2005).

$$L(\lambda_i) = \Pi i \left(\frac{1/\alpha}{(1/\alpha)+\lambda_i}\right)^{(1/a)} \left(\frac{\lambda_i}{(1/\alpha)+\lambda_i}\right)^{y_i} \frac{\gamma((1/\alpha)+y_i!)}{\gamma(1/\alpha)\,y_i!} \tag{7}$$

3. Descriptive Statistics

The aim of this study is to investigate the relation between publication quality measured via different quality proxies and various team and project characteristics. Table 3 presents the descriptive statistics for the underlying quality proxies and explanatory variables.

On average a working paper receives 4.11 normalized citations. However, the citation frequencies strongly vary between zero and 139.2, which indicates the existence of strong quality differences. I also provide summary statistics for the two alternative quality proxies, i. e., JIF and publication success in top 10 finance journals. Concerning the team characteristics, 88 % of all working papers in the sample are co-authored, and a working paper is written by 2.46 researchers on average, which is in line with existing studies (*Holder* et al. 2000; *Medoff* 2003; *Acedo* et al. 2006; *Manton/English* 2007; *Chung* et al. 2009). The mean age of research teams is 46.28 years. Interestingly, only 18 % of all survey participants are female. Additionally, less than 40 % of all research collaborations consisted of researchers of both sexes. This indicates that women are still underrepresented in financial research. Interestingly, 82 % of all research teams communicated regularly, i. e., at least once a week, during the project. On average, authors published 3.47 articles in the top 10 finance journals, the measure to proxy for author scholarly capability. Finally, almost 70 % of all researchers were satisfied with the research collaboration and would like to work with her team members in future research projects, again[13]. With respect to project characteristics, almost 50 % of all working papers were presented at two or more conferences. These figures confirm the perception that conferences are an integral part in the value chain in the publication process and is in line with findings of *Kerl* et al. (2018). In contrast, only 17 % of all working papers have been presented at one of the top tier conferences. Finally, on average working papers were presented at 2.53 research seminar series.

[13] The survey also includes additional questions about perceptions of survey participants regarding general trends and current patterns in the publication process. The results of these questions are available upon request.

Table 3

Descriptive Statistics

	(1) Norm Citations	(2) JIF	(3) Publ Success Top 10 Journals	(4) Team	(5) # Authors	(6) Male	(7) Ø Age	(8) Gender Diversity	(9) Aff Diversity	(10) Comm Intensity	(11) Auth Quality	(12) Team Work Quality	(13) Multiple Conf Pres	(14) Top Tier Conf Pres	(15) # Research Seminars
Min	0	0.25	0	0	1	0	27	0	0	0	0	0	0	0	0
Max	139.20	6.66	1	1	5	1	72	1	1	1	11	1	1	1	11
Mean	4.11	2.16	0.16	0.88	2.46	0.82	46.28	0.39	0.58	0.82	3.47	0.69	0.47	0.17	2.53
Std Dev	10.60	1.49	0.37	0.32	0.84	0.38	7.54	0.49	0.49	0.38	3.61	0.46	0.50	0.38	2.50
N	945	295	600	945	945	939	535	787	621	691	865	696	755	945	713

Notes: This table presents descriptive statistics for the underlying quality proxies and explanatory variables. Column (1) displays the number of *normalized citations*, i.e., the year adjusted number of citations a working paper has received as working paper and published journal article. Column (2) shows the *JIF score* for each analysed working paper. Unpublished working papers and journals not covered by the JIF obtain a JIF score of zero. Column (3) presents the *publication success in top 10 finance journals*. Top 10 finance journals are defined as the 10 finance journals with the highest JIF scores. *Team* in column (4) shows the dummy variable that equals one if the paper is written by a team of researchers and zero otherwise. *# Authors* in column (5) measures the number of authors of the working paper, i.e., the team size. *Male* in column (6) presents the sex of the survey population. Ø Mean age in column (7) measures the mean age of the research team. *Gender diversity* in column (8) displays a dummy variable that equals one if the working paper is written by a team of researchers and at least one of the team members is female and zero otherwise. *Aff Diversity* column (9) presents a dummy variable that equals one if the working paper is written by a team of researchers and at least one of the team members was located at a different affiliation than the remaining team members and zero otherwise. *Comm Intensity* in column (10) shows the information exchange frequency which is a dummy variable that equals one if the working paper was written by a team of researchers and the team exchanged information frequently, i.e., at least once a week, and zero otherwise, i.e., information exchange less than once a week. This variable measures the intensity of the team work. Column (11) presents *Auth Quality*. This variable measures the quality or experience of the author of a working paper. An author's quality is measured by the number of articles the author has been published in one of the top 10 finance journals. *Team Work Quality* in column (12) presents the satisfaction with cooperation, a dummy variable that equals one if the members of the research team have been satisfied with the team work and would like to cooperate with the same team members on future research projects again. *Multiple Conf Pres* in column (13) is a dummy variable that equals one if the working paper has been presented at two or more conferences and zero otherwise. *Top Tier Conf Pres* in column (14) is a dummy variable that equals one if the working paper has been presented at one of the top tier finance conferences at least once and zero otherwise. Based on Kerl et al. (2018), I define top tier finance conferences as the annual meetings of the American Finance Association, the Western Finance Association, and the European Finance Association. Finally, *# Research Seminars* in column (15) presents the number of research seminar presentations.

V. Empirical Analysis

1. Results Based on Normalized Citations

The results of the empirical analysis based on normalized citations are presented in Table 4. Column (1) presents the relation between normalized citations and different project characteristics. It is based on all papers in the sample, i. e., single and co-authored working papers. The estimation outcome indicates that research collaborations are associated with higher citations. Additionally, author quality measured via the number of authors' publications in top 10 finance journals, is significantly positively related with citation frequencies, too. The same is true for the project characteristics presentation at top tier finance conferences and presentation frequency at research seminar series.

Whereas column (1) focuses on project characteristics, column (2) shows the relation between various team characteristics and research quality measured via normalized citations. As a consequence, only co-authored working papers are included in this estimation. Generally, the results of the different project characteristics obtained from the previous analysis are confirmed by the model focusing on team based working papers. With respect to team characteristics, the estimation outcomes suggest that the number of authors is significantly positively related with citation frequencies. The same is true for communication intensity, i. e., a more frequent information exchange between team participants is associated with higher research quality. Similar to the previous model, there is a positive impact of author's scholarly capability on the quality of research output. However, the results do not indicate a significant relation between any other team characteristic and paper quality, i. e., neither mean age nor gender or affiliation diversity seem to be associated with research quality. Interestingly, the same holds true for team work quality indicating a professional working attitude of finance researchers.

To summarize, team collaboration, number of authors, author quality, presentation at top tier finance conferences, and presentation frequency at research seminar series are associated with higher citation frequencies. In contrast, the remaining team and project characteristics do not seem to be related with research quality measured via citations. These findings confirm the majority of existing studies documenting a positive effect of co-authoring on research output (see section II. 2. a) Co-authorship).

2. Modified Analysis Based on Normalized Citations per Author

As team collaboration might tie up substantially more resources than sole authorship with respect to the overall amount of time actually spent on and capac-

Table 4

Empirical Analysis – Normalized Citations as Quality Proxy

Norm. citations	**(1)**	**(2)**
Team	0.756***	
	(0.200)	
# Authors		0.186*
		(0.113)
Ø Age		–0.0224
		(0.0568)
Gender Diversity		–0.163
		(0.217)
Aff Diversity		0.0451
		(0.262)
Comm Intensity		0.871***
		(0.206)
Auth Quality	0.0621***	0.0695**
	(0.0234)	(0.0295)
Team Work Quality		0.327
		(0.228)
Multiple Conf Pres	0.195	0.153
	(0.232)	(0.285)
Top Tier Conf Pres	0.571***	0.497**
	(0.201)	(0.240)
# Research Seminars	0.163***	0.161***
	(0.0281)	(0.0319)
Const	–0.437**	–0.958**
	(0.207)	(0.470)
N	679	459
Wald Chi^2	168.4	210.6
(p-value)	0.000	0.000

Notes: This table shows the relation between normalized citations as quality proxy and various team and project characteristics based on a negative binomial regression. Column (1) presents the results of the model based on all working papers, i. e., sole- and multi-authored papers. Column (2) shows the results of the model based on multi-authored papers, only. The following team and project characteristics are used in the models as explanatory variables: *Team* is a dummy variable that equals one if the paper is written by a team of researchers, and zero otherwise. *# Authors* measures the number of authors of a paper. *Ø Age* measures the mean age of the research team. *Gender diversity* is a dummy variable that equals one if the research team consists of different researchers of both genders, and zero otherwise. *Aff Diversity* is a dummy variable that equals one of the research team consists of researchers working at different affiliations, and zero otherwise. *Comm Intensity* is a dummy variable that equals one if the research team regularly exchanged information regarding the research project, i. e., at least once a week, and zero otherwise. *Author Quality* proxies the author's experience in publishing financial research measured via Top 10 finance journal publications. *Team Work Quality* is a dummy variable that measures the satisfaction with the team work on the research project and equals one if the authors are willing to cooperate on a future research project, again, and zero otherwise. *Multiple Conf Pres* is a dummy variable that equals one if the paper was presented at more than two finance conferences, and zero otherwise. *Top Tier Conf Pres* is a dummy variable that equals one if the paper was presented at least at one top tier finance conferences, and zero otherwise. *# Research Seminars* measures the number of research seminars the paper was presented at. Standard errors are reported below the coefficients in parentheses. ***,**, and * indicate statistical significance at the 1 %, 5 %, and 10 % level, respectively.

ities devoted to the research project, the quantitative or qualitative output is supposed to increase proportionally. However, *Hamermesh* (2018) documents that multi-authored papers indeed receive more citations than single authored papers, though citations roughly only double from one to four or more authors but do not quadruple. Consequently, in an additional analysis based on a negative binomial estimation method, normalized citations are discounted by the number of authors.

The results are presented in Table 5. Column (1) presents the results of the relation of different project characteristics and normalized citations per author based on all papers in the sample. Whereas the results of the first analysis are confirmed by this modified analysis for most of the variables, the significant positive relation between collaboration and citation frequencies disappears when controlling for the number of authors. These findings are confirmed by the model focusing on team projects, only (column 2). Discounting citations by the number of authors eliminates the positive relation between number of authors and citation frequencies. These findings are in line with previous studies of *Hollis* (2001), *Medoff* (2003), *Ductor* (2015), and *Hamermesh* (2018). In contrast, the relation of the remaining team and project characteristics and normalized citations per author is the same as in the first analysis using unadjusted normalized citation frequencies.

To conclude, the results obtained in the first analysis are confirmed for most of the underlying team and project characteristics when controlling for author number. However, more co-authors do not result in significantly higher citation frequencies. In light of these findings, the common practice of universities and other granting agencies to preferentially reward research collaborations to maximize research output seems to be questionable (*Hollis* 2001). Therefore, at the very least, multi-authored articles should be discounted by some factor (*Hamermesh* 2018).

3. Further Analyses

For robustness purposes, I additionally apply alternative proxies that are frequently used to measure research quality. This is important as citation counts at the paper-level have been criticized among others for self-citation (*Chan* et al. 2002), journal bias (*Pons-Novell/Tirado-Fabregat* 2010), and fractional citation counting (*Medoff* 2003; *Lee/Bozeman* 2005). The first alternative quality proxy is publication success in top 10 finance journals[14]. Publication success in top 10 finance journals is a binary outcome taking either the value of one, if the paper

[14] To define top 10 finance journals, I refer to the ranking scores of the 5-Year Journal Impact Factors (JIF) obtained from the Journal Citation Reports (JCR).

Table 5

Determinants of Research Quality – Normalized Citations per Author as Quality Proxy

Norm. citations per author	(1)	(2)
Team	–0.179	
	(0.197)	
# Authors		–0.125
		(0.122)
Ø Age		–0.0287
		(0.0541)
Gender Diversity		–0.212
		(0.211)
Aff Diversity		0.0769
		(0.250)
Comm Intensity		0.877***
		(0.199)
Auth Quality	0.0571**	0.0683**
	(0.022)	(0.030)
Team Work Quality		0.327
		(0.211)
Multiple Conf Pres	0.308	0.207
	(0.212)	(0.277)
Top Tier Conf Pres	0.615***	0.450*
	(0.186)	(0.234)
# Research Seminars	0.137***	0.156***
	(0.025)	(0.031)
Const	–0.418**	–1.039**
	(0.196)	(0.459)
N	679	459
Wald Chi^2	161.4	191.1
(p-value)	0.000	0.000

Notes: This table shows the relation between normalized citations per author and various team and project characteristics based on a negative binomial regression. Normalized citations per author are defined as normalized citations divided by the number of authors of the respective working paper. Column (1) presents the results of the model based on all working papers, i. e., sole- and multi-authored papers. Column (2) shows the results of the model based on multi-authored papers, only. The following team and project characteristics are used in the models as explanatory variables: *Team* is a dummy variable that equals one if the paper is written by a team of researchers, and zero otherwise. *# Authors* measures the number of authors of a paper. *Ø Age* measures the mean age of the

research team. *Gender diversity* is a dummy variable that equals one if the research team consists of different researchers of both genders, and zero otherwise. *Aff Diversity* is a dummy variable that equals one of the research team consists of researchers working at different affiliations, and zero otherwise. *Comm Intensity* is a dummy variable that equals one if the research team regularly exchanged information regarding the research project, i. e., at least once a week, and zero otherwise. *Author Quality* proxies the author's experience in publishing financial research measured via Top 10 finance journal publications. *Team Work Quality* is a dummy variable that measures the satisfaction with the team work on the research project and equals one if the authors are willing to cooperate on a future research project, again, and zero otherwise. *Multiple Conf Pres* is a dummy variable that equals one if the paper was presented at more than two finance conferences, and zero otherwise. *Top Tier Conf Pres* is a dummy variable that equals one if the paper was presented at least at one top tier finance conferences, and zero otherwise. *# Research Seminars* measures the number of research seminars the paper was presented at. Standard errors are reported below the coefficients in parentheses. ***,**, and * indicate statistical significance at the 1 %, 5 %, and 10 % level, respectively.

is successfully published in one of the top 10 finance journals, or zero, otherwise. Consequently, I apply a logit model, a commonly used type of discrete choice models, to estimate the relationship between the underlying team and project characteristics of a paper and its research quality. In the logit model the probability, *P* that a paper *i* is published in one of the top 10 finance journals is then calculated using the cumulative logistic function of the form:

$$P(y_i = 1 \mid Z_i) = \frac{1}{1 + e^{-Z_i}}, \tag{8}$$

and

$$Z_i = \beta_0 + \beta_i X_i + \varepsilon_i\,, \tag{9}$$

where β_0 is a constant, X_i is a vector comprising the various explanatory variables, i. e., the different team and project characteristics, and β_i is the vector of regression coefficients, and $\in_i$ is the error term.

The vector of regression coefficients is estimated using the maximum likelihood method to maximize the log-likelihood function:

$$logL(\beta) = \sum\nolimits_{i=1}^{n} y_i log p_i + (1 - y_i) log\,(1 - p_i), \tag{10}$$

where p_i depends on X_i and β_1 through the logit transformation of equation Z_i; y_i is the publication outcome of paper *i*, i. e., 1, if the paper is published in one of the top 10 finance journals, or 0, otherwise.

Additionally, I also apply another commonly used quality proxy, the Journal Impact Factor (JIF) (*Reinartz/Urban* 2017). The JIF is a citation-based journal quality assessment, as the JIF of a particular journal corresponds to the number of citations the average publication in that journal generates in a predetermined year after its publication[15]. To estimate the relation between the various team

and project characteristics of a paper and its research quality measured via the JIF, an ordinary least square (OLS) estimation is used:

$$Y_i = \beta_0 + \beta_i X_i + \varepsilon_i \,, \tag{11}$$

where Y_i is the JIF score of the respective journal in which paper *i* was published, β_0 is a constant, X_i is a vector comprising the various explanatory variables, i. e., the different team and project characteristics, and β_i is the vector of regression coefficients, and $\in_i$ is the error term.

Table 6

Empirical Analysis – Alternative Quality Proxies

	Publ Success Top 10 Fin Journals		JIF	
	(1)	(2)	(3)	(4)
Team	1.362*		0.098	
	(0.803)		(0.158)	
# Authors		0.207		0.37***
		(0.313)		(0.127)
Ø Age		–0.266		7.63E-05
		(0.162)		(0.086)
Gender Diversity		–0.294		–0.142
		(0.403)		(0.178)
Aff Diversity		–0.312		–0.208
		(0.409)		(0.202)
Comm Intensity		0.505		0.0313
		(0.711)		(0.275)
Auth Quality	0.086**	0.176***	0.028	0.0669**
	(0.044)	(0.055)	(0.023)	(0.029)
Team Work Quality		0.0477		0.0999
		(0.471)		(0.231)
Multiple Conf Pres	1.205***	1.22**	0.116	0.179
	(0.399)	(0.472)	(0.137)	(0.187)
Top Tier Conf Pres	1.877***	1.369***	1.263***	0.784**
	(0.339)	(0.432)	(0.249)	(0.311)
# Research Seminars	0.239***	0.282***	0.151***	0.158***
	(0.059)	(0.072)	(0.038)	(0.046)
Const	–5.581***	–3.892***	0.962***	–0.00979
	(0.878)	(1.323)	(0.165)	(0.708)

(continue next page)

[15] For the exact calculations used for the JIF, see http://ipscience-help.thomsonreuters.com/inCites2Live/indicatorsGroup/aboutHandbook/usingCitationIndicatorsWisely/jif.html.

(table 6 continued)

N	469	321	218	149
(Pseudo) R-squared	34.41 %	35.50 %	42.50 %	42.64 %
Chi^2/ F	149.90	104.40	22.20	8.48
(p-value)	0.00	0.00	0.00	0.00

Notes: This table shows the relation between alternative quality proxies and various team and project characteristics. Column (1) and column (2) present the relation between publication success in top 10 finance journals and various team and project characteristics based on a logit regression. Column (3) and column (4) show the relation between JIF scores of the publication outlets of the underlying working paper and various team and project characteristics based on an ordinary least square regression. Column (1) and column (3) present the results of the model based on all working papers, i. e., sole- and multi-authored papers, whereas column (2) and column (4) show the results of the model based on multi-authored papers, only. The following team and project characteristics are used in the models as explanatory variables: *Team* is a dummy variable that equals one if the paper is written by a team of researchers, and zero otherwise. *# Authors* measures the number of authors of a paper. *Ø Age* measures the mean age of the research team. *Gender diversity* is a dummy variable that equals one if the research team consists of different researchers of both genders, and zero otherwise. *Aff Diversity* is a dummy variable that equals one of the research team consists of researchers working at different affiliations, and zero otherwise. *Comm Intensity* is a dummy variable that equals one if the research team regularly exchanged information regarding the research project, i. e., at least once a week, and zero otherwise. *Author Quality* proxies the author's experience in publishing financial research measured via Top 10 finance journal publications. *Team Work Quality* is a dummy variable that measures the satisfaction with the team work on the research project and equals one if the authors are willing to cooperate on a future research project, again, and zero otherwise. *Multiple Conf Pres* is a dummy variable that equals one if the paper was presented at more than two finance conferences, and zero otherwise. *Top Tier Conf Pres* is a dummy variable that equals one if the paper was presented at least at one top tier finance conferences, and zero otherwise. *# Research Seminars* measures the number of research seminars the paper was presented at. Standard errors are reported below the coefficients in parentheses. ***,**, and * indicate statistical significance at the 1 %, 5 %, and 10 % level, respectively.

The results of the robustness tests are presented in Table 6. Columns (1) and (2) present the results of the first alternative quality proxy, i. e., publication success in top 10 finance journals. As shown in column (1) which presents the estimation outcome for single and co-authored working papers, all explanatory variables are significantly positively associated with publication success in top 10 finance journals. In contrast to the main analysis, multiple conference presentation is also significantly related with research quality. However, for the remaining characteristics the model reveals the same results as for (unadjusted) citation frequencies.

The results focusing on team projects are shown in column (2). Similar to the main analysis, they suggest a positive relation between participation frequencies at research seminar series, presentation at top tier conferences, and author quality. In addition, it also indicates no significant relation between publication success in top 10 finance journals, team work quality, mean age, gender diversity, and affiliation diversity. Furthermore, as in the model using single and co-authored papers, multiple conference presentation is significantly related with publication success in top 10 finance journals. In contrast, neither the number of authors nor the communication intensity is associated with publication success in top 10 finance journals.

To sum up, the use of publication success in top 10 finance journals as alternative quality proxy generally confirms the conclusions obtained by (unadjusted) citation frequencies, i. e., a significant and positive relation between publication success in top 10 finance journals on the hand and author quality, top tier conference presentation, and research seminar series presentation frequency on the other hand. Similar to (unadjusted) citation frequencies, publication success in top 10 finance journals is not associated with mean age, gender diversity, and affiliation diversity. However, similar to the results obtained for the quality proxy citations per author, publication success in top 10 finance journals is not related with author number. In contrast, whereas communication intensity is significantly associated with citation frequencies, the model indicates no relation for the publication success in top 10 finance journals. Interestingly, exactly the opposite is true for multiple conference presentation.

The results of the last alternative quality proxy, JIF, are presented in column (3) which shows the results for all papers, and column (4) which focuses on research collaborations, only. The general model suggests that multiple conference presentation, top tier conference presentation, and research seminar series participation frequencies are positively related with JIF scores. In contrast, neither research collaboration nor author quality is associated with this quality proxy. Comparing the results between JIF scores and (unadjusted) citation frequencies focusing on team collaborations reveal the same findings for number of authors, author quality, top tier conference presentation, and participation frequencies at research seminar series as all of these characteristics are positively related with research quality for both quality proxies. At the same time, mean age, gender diversity, affiliation diversity, team work quality, and multiple conference presentation are not associated with JIF scores, thereby confirming the results obtained from citation frequencies. The only deviation between the quality proxies JIF scores and citation frequencies stems from communication intensity which is not related with JIF scores.

To sum up, the results using JIF scores as underlying quality proxy strongly confirm the findings obtained by citation frequencies, i. e., a positive relation between research quality at the one hand and top tier conference presentation, research seminar presentation frequency, number of authors, and author quality on the other hand. Additionally, there is no significant relation between research quality and mean age, gender diversity, affiliation diversity, multiple conference presentation, and team work quality for both quality proxies. As communication intensity is not associated with higher JIF scores, it is the only characteristic with deviating impact compared to the model based on (unadjusted) citation frequencies.

4. Discussion of Empirical Analyses

As discussed in section II, because one is not able to say conclusively which of the different quality measures is the correct one (*Coupé* 2013), I base my overall evaluation of the relation between the different team and project characteristics and research quality on results obtained from several quality proxies, i. e., unadjusted and adjusted normalized citations, publication success in top 10 finance journals, and the JIF. The findings suggest a positive relation between research quality and several project characteristics. First, the presentation frequency of a working paper at research seminar series is associated with higher research quality. This result confirms the study of *Brown* (2005) who discusses the important role of research seminar series on paper quality. Furthermore, the participation at top tier finance conferences is positively associated with higher quality of the research output. These findings are in line with conclusions of *Kerl* et al. (2018) who argue that top tier finance conference participation is beneficial for publication quality by improving a paper's quality due to valuable feedback and discussions[16]. Besides, as reported by previous studies (*Medoff* 2003; *Chung* et al. 2009), I document a significant positive relation between author's experience or quality and research output.

In contrast, the results do not indicate a significant relation between any other team characteristic and paper quality. Neither mean age nor the gender or affiliation diversity of collaborations seem to be associated with research quality. These findings are in line with previous research also documenting that demographic factors such as gender or age (van *Knippenberg/Schippers* 2007; *Bell* et al. 2011; *van Dijk* et al. 2012), and affiliation diversity (*Stvilia* et al. 2011) have no significant influence on the quality of research output. Interestingly, the same holds true for team work quality which indicates that researchers professionally cooperate in existing teams even if they are not willing to work with the same team members in future research projects again[17].

Besides, there are some team and project characteristics with deviating findings depending on the underlying model and quality proxy. First, multiple conference presentation is the only factor associated with higher publication success in top 10 finance journals. Second, communication intensity is related with higher adjusted and unadjusted citation frequencies. Third, the number of au-

[16] In unreported results, I also find no significant impact of additional project characteristics on paper quality. The investigated variables include the methodological approach of the paper, regional background of data if it is an empirical paper, applied author ordering rule, and time-to-market, i. e., the time span between the initiation of the research project and paper publication.

[17] In unreported results, I also find no significant relation between research quality and additional team characteristics such as country entropy.

thors is associated with higher JIF scores but not with publication success in top 10 finance journals and citation frequencies – at least when adjusted citation frequencies, i. e., citations per author, are used. Finally, research collaborations are related with publication success in top 10 finance journals but not with JIF scores. Even though team collaborations are cited more frequently, they are not associated with higher citations per author. The latter is in line with previous studies of *Hollis* (2001), *Medoff* (2003), *Ductor* (2015), and *Hamermesh* (2018) who after discounting citations by the number of authors report no positive impact of research collaborations on research quality measured via citation frequencies.

VI. Conclusion

Publication success is frequently used for merit, promotion, and tenure decisions which increases the pressure for researchers to successfully publish high quality research (*Chan* et al. 2013). Consequently, the identification of potentially important characteristics that are associated with the quality of research output is crucial for the individual future scholarly success of academics in all fields of research. However, most of the previous studies focused on co-authorship, only, or constrain themselves either to a group of papers which are published or aimed to be published in elite journals, or focus on published articles in some prestigious journals (*Tompkins* et al. 1997; *Holder* et al. 2000; *Chung* et al. 2009). The limitation to only a small subset of the entire quality range of research output may lead to severe selection biases as these studies do not consider a representative working paper population (*Krapf* 2015).

My study overcomes this shortcoming by surveying authors of working papers that were presented at 15 international finance conferences between 2007 and 2009. For that purpose, I analyse 945 former conference papers written by 882 scholars from research institutions in 46 different countries. This enables me to research both published and unpublished research collaborations that are spread throughout the whole quality spectrum. In addition, based on the results of this survey of conference participants, I am able to also shed light on the impact of new team characteristics that have not been studied, yet, i. e., communication intensity and team work quality. Similar to other studies examining research quality, I apply different quality proxies, i. e., normalized citations, JIF, publication success in top 10 finance journals, to investigate whether the different team and project characteristics are associated with the quality of the underlying working paper.

The results show that the following project characteristics are positively related with research quality: presentation frequency at research seminar series, presentation at top tier conferences, and author quality. These findings are in

line with existing studies which also suggest quality enhancing effects of these variables (*Brown* 2005; *Chung* et al. 2009; *Kerl* et al. 2018). In contrast, gender heterogeneity, affiliation diversity, mean age, and team work quality are not associated with output quality. Thereby, the results confirm previous research (*Bell* et al. 2011; *Stvilia* et al. 2011; *van Dijk* et al. 2012). Besides, the analyses suggest mixed results for multiple conference presentation and communication intensity as both characteristics are positively related with just one of the three different applied quality proxies. Finally, even though team collaborations are cited more frequently, they are not associated with higher citations per author. The latter is in line with previous studies of *Hollis* (2001), *Medoff* (2003), and *Hamermesh* (2018).

Even though this study avoids some of the biases of prior studies, it has several limitations. As previously discussed, I am not able to certainly exclude the existence of endogeneity. Consequently, I avoid to infer directions of causalities with respect to the documented relations between research quality and team and project characteristics. To improve results' validity, more structural estimations based on a broader data base should be applied. Therefore, it would be beneficial to incorporate additional explanatory variables, e. g., quality of an author's institution, or more detailed information about the utilized variables, e. g., characteristics of the research seminar series at which the working paper have been presented at. Additionally, the use of suitable instrument variables to deal with endogeneity concerns would allow to infer the directions of causalities with respect to the documented relations between research quality and the related team and project characteristics.

The results of this study substantiate the important role of conferences and research seminar series in the value chain of the publication process, thus, they may provide researchers with guidance to efficiently allocate their scarce time and travel budgets in deciding which conference or research seminar series to attend. Whereas recent studies (*Reinartz/Urban* 2017; Kerl et al. 2018) shed light on the existing quality differences between different academic finance conferences, to the best of my knowledge, little is known about research seminar series, yet. In this sense, I hope to stimulate further research on the quality characteristics of research seminar series.

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