

On the relation between intellectual collaboration and intellectual output: Evidence from the finance academe

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Abstract

This paper tests the relation between intellectual collaboration and the quality of the intellectual output using academic papers published in prestigious finance journals during 1988-2005. We use the number of authors of a paper to measure the extent of intellectual collaboration and the number of citations that a paper receives (adjusted by the number of years since the paper's publication) as a measure of its intellectual value. Based on empirical tests, we find that papers with more authors are cited more often. This relation does not hold for purely theoretical papers. Coauthoring with a prolific author leads to higher quality papers, but coauthoring with colleagues at the same institution leads to neither higher nor lower quality papers. Papers with four authors are cited most often. Overall, when it comes to intellectual collaboration, our results counter the notion that "too many cooks spoil the broth."

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Abstract

This paper tests the relation between intellectual collaboration and the quality of the intellectual output using academic papers published in prestigious finance journals during 1988-2005. We use the number of authors of a paper to measure the extent of intellectual collaboration and the number of citations that a paper receives (adjusted by the number of years since the paper's publication) as a measure of its intellectual value. Based on empirical tests, we find that papers with more authors are cited more often. This relation does not hold for purely theoretical papers. Coauthoring with a prolific author leads to higher quality papers, but coauthoring with colleagues at the same institution leads to neither higher nor lower quality papers. Papers with four authors are cited most often. Overall, when it comes to intellectual collaboration, our results counter the notion that "too many cooks spoil the broth."

1. Introduction

Consider the following two American sayings, “the more the merrier” and “too many cooks spoil the broth.”^{1,2} Both sayings are equally well known and both are largely regarded as conventional wisdom, but yet they convey *opposite* messages. Which message is correct? The obvious answer is that there is probably some middle ground, and where that middle ground can be found is likely to depend on the task at hand. What about tasks that involve intellectual pursuits, such as the general pursuit of knowledge? Is it more productive to pursue intellectual endeavors individually or with others? This question is obviously of tremendous importance, as the intellectual pursuit of knowledge is largely regarded as one of the important endeavors of humankind.³ Our study contributes some empirical evidence to this important question. We examine the relation between intellectual collaboration and its intellectual output. Specifically, we study academic papers published in prestigious finance journals to see if coauthored papers have more intellectual value than solo-authored papers.

The academic study of finance and financial economics is clearly indicative of an intellectual pursuit of knowledge. For example, the academic organization that publishes the *Journal of Finance* states that its aim is “devoted to the study and promotion of knowledge...”⁴ Much has already been written about academic collaboration and its output, not only in the finance profession (e.g., see Holder, Langrehr, Schroeder (2000) and numerous references therein), but also in other academic fields including economics (e.g., Barnett, Ault, and Kaserman (1988), Hudson (1996), Laban and Tollison (2000), Sauer (1988)), political science (e.g., Fisher, Cobane, Vander Ven, and Cullen (1998)), criminology (e.g., Fisher, Vander Ven,

¹ See *The New Dictionary of Cultural Literacy*, which is available online at <http://www1.bartleby.com/59/>.

² Another opposite saying to “too many cooks...” is “there is safety in numbers.”

³ The importance of the intellectual pursuit of knowledge to humankind dates back at least to the Greek philosophers. See http://en.wikipedia.org/wiki/Greek_philosophy and links therein.

Cobane, Cullen, and Williams (1998)), library science (e.g., Bahr and Zemon (2000)), education (e.g., Fox and Faver (1984)), psychology and social psychology (e.g., Over (1982) and Presser (1980)), accounting (e.g., Brown (2005)), and management and organizations (e.g., Acedo, Barroso, Casanueva, and Galan (2006)). Almost all of these papers on academic collaboration focus on the nature of coauthoring, its determinants, the allocation of work and credit among coauthors, and coauthoring trends.

According to group decision-making theory, the tradeoff between working as an individual versus working as a team is considered straightforward. Larger teams combine the wisdom and talents of individuals, so teams may be more productive than individuals. However, coordination and process problems increase with team size.^{5,6} Hudson (1996) proposes tradeoffs that are specific to coauthoring in economics, which is a field for which finance is largely regarded as a subset. He states that the advantage to coauthoring is that it allows for an efficient division of labor. Publishing in the top economics journals has become increasingly more difficult as the subject area has grown and techniques have become more advanced. As stated by Hudson (1996), a good economics paper nowadays usually contains at least two, if not all three, of the following three elements: good and/or novel idea, high-powered theory/math, and/or high powered empirics/econometrics. Synergistic coauthoring can facilitate the process of producing a good economics paper. Many other economists have also contended that coauthoring leads to better quality intellectual output (e.g., see Barnett et al. (1988)). Members of the finance academe seem to share this sentiment. In a survey of successful authors in the finance

⁴ <http://www.afajof.org>

⁵ In studies of group decision-making, teams are found to be more productive than individuals at accomplishing tasks, however, as teams increase in size the disadvantages outweigh the advantages (e.g., see Hackman (1990) and Steiner (1972)).

⁶ The academic literature on the size of corporate board of directors is pertinent. Board size has been found to be negatively correlated to its firm value (e.g., Yermack (1996)).

profession, the top reason given for coauthoring is that it increased the quality of the output (see Holder et al. (2000)).

The disadvantages of coauthoring, according to Hudson (1996), are that it involves coordination and, perhaps most importantly, coauthors may have to make compromises when working with one another that lead to reduced risk-taking and thus quality. That is, “too many cooks spoil the broth.” Hudson (1996) also suggests that authors may simply put in $1/n^{\text{th}}$ amount of work into coauthored papers, where ‘n’ is the number of authors on a paper, as opposed to the 100 percent of the work obviously needed for solo-authored papers. It may be that ‘n’ authors collectively put in just enough efforts to make the paper acceptable by journal referees and/or editors. If this were the case, synergies and value-added contributions from having additional authors may not materialize from coauthorship. It is worth mentioning that it is also entirely possible that as ‘n’ gets larger, then an author might do less than $1/n^{\text{th}}$ of the work, which is indicative of the well-known free-rider problem.

The existing empirical evidence on the relation between intellectual collaboration and intellectual output quality, which is unfortunately scant, is either weak or mixed. Presser (1980) finds that coauthored social psychology papers have a higher acceptance rate by journals than do solo-authored papers, suggesting that coauthored papers are of better quality on average. Laband and Tollison (2000) study economics papers and they also find a higher acceptance rate for coauthored papers than solo-authored papers. Brown (2005) finds evidence that *informal* collaboration leads to better quality academic papers. He documents that academic accounting papers that were widely circulated and frequently presented at conferences and/or seminars had a higher chance of getting accepted by a prestigious accounting journal. That is, getting and incorporating feedback from others, which is an informal form of collaboration, improves the

quality of academic papers. These findings are telling, but they have a shortcoming. To characterize the quality of a paper by a binary variable (i.e., accepted paper is a good paper, rejected paper is a bad paper), is an overly simple generalization, especially given the fact that journal acceptance decisions are usually made by only a few people including the journal referee(s) and the editor. Many good economics papers, even some of the so-called classics, have been rejected by journals (see Gans and Shephard (1994)).

Laband and Tollison (2000) find that published papers that *thanked* more people in their acknowledgements were papers that were more often cited by other papers. If the number of citations that a paper receives appropriately proxies for the quality of that paper, then their study suggests that collaboration, the informal kind, does lead to high quality intellectual output. The two benefits of using citation data to measure paper quality, as opposed to a journal accept/reject measure of paper quality, is that a paper's number of citations is akin to a continuous measure of paper quality, and, it is also reflective of a market measure of quality as the entire academic community can decide whether or not a paper is worth citing. Unfortunately, while Laband and Tollison (2000) investigate the relation between formal collaboration (i.e., coauthoring) and journal acceptance, and the relation between informal collaboration and citations, they do *not* investigate the relation between formal collaboration and citations.

In contrast to the above studies that suggest that coauthoring and collaboration lead to better papers, Medoff (2003) finds that coauthored economics papers are *not* of higher quality than solo-authored papers. In addition, Acedo et al. (2006) find very weak evidence that coauthored management papers are of higher quality than solo-author papers. As with Laband and Tollison (2000), both Medoff (2003) and Acedo et al. (2006) measure paper quality by the number of citations that it receives, and they find either no statistical relation or weak statistical

relation between the number of authors on a paper and the number of citations that the paper receives. While there are many papers in the finance literature that have looked at the publishing productivity of finance scholars and citation patterns (e.g., Chung and Cox (1990), Zivney and Bertin (1992), Alexander and Mabry (1994), Borokhovich, Bricker, Brunanski, and Simkins (1995), Fische (1998), Chung, Cox, and Mitchell (2001)), none has looked at the relation between coauthoring and output quality as measured by citations.

To see if intellectual collaboration leads to high quality intellectual output, we use the number of authors on a published finance paper to measure the extent of collaboration, and we use the number of times the paper is cited (adjusted by the number of years since the paper's publication) as a measure of its intellectual value. In this regard, our paper is similar to Medoff (2003). However, while Medoff (2003) only studies economics papers published during one year, 1990, we study all papers published in the most prestigious finance journals from 1988 through 2005. More importantly, while Medoff (2003) finds no relation between the number of authors on a paper and its subsequent number of citations, we find strong evidence that coauthored papers are cited more often. This relation disappears for papers that are purely theoretical, as opposed to papers that have empirical content.

We also find that it matters with whom one coauthors. Not surprisingly, papers coauthored with a prolific author in finance are of higher quality (i.e., they are cited more often than other papers). Interestingly, papers coauthored with colleagues from the same institution are *not* of higher quality. Apparently, coauthors do not derive synergistic benefits, which in turn lead to higher quality papers, from being in the same physical location. Finally, we document that papers with four authors are cited most often.

All of these results survive a battery of robustness checks. As such, we offer the first solid piece of evidence (not just in finance but in any academic field) that intellectual collaboration leads to higher quality output, where paper quality is measured by citations. We also describe some of the conditions (though, they are not necessary conditions) for which collaboration leads to higher quality output. Overall, therefore, when it comes to intellectual collaboration, our paper counters the notion that “too many cooks spoil the broth” (at least for the academic finance profession, and at least for papers that go from having one author to four authors).

Our paper raises an issue regarding how academia might wish to assess and measure one’s research productivity. When quantifying one’s research productivity, we sometimes count the number of papers that the person has published, where papers with n authors are often counted as $1/n^{\text{th}}$ of a paper. If coauthored papers tend to be of higher quality than solo-authored papers, as we find in our study, then this practice potentially undercounts the productivity of a scholar who often coauthors.

The rest of our paper proceeds as follows. In the next section, we describe our data. Section 3 provides some stylized facts about coauthoring in the academic finance profession. Section 4 presents a variety of empirical results. The last section concludes.

2. Data

Our initial study sample includes all papers published by the five most prestigious finance journals, including the *Journal of Finance*, *Journal of Financial Economics*, *Review of Financial Studies*, *Journal of Financial and Quantitative Analysis*, and *Financial Management*, during the period from 1988 through 2005. The first four journals are widely regarded as top academic journals in finance (e.g., see Alexander and Mabry (1994), Zivney and Reichenstein

(1994), Swidler and Goldreyer (1998), Borokovich, Bricker, and Simkins (1999), and Oltheten, Theoharakis, and Travlos (2003)). *Financial Management* is often viewed as the fifth best journal in the finance profession (see Borokhovic, Bricker, and Simkins (1999)), but we realize that this view is not without dissenting opinions. We conduct journal specific tests later in the paper and our overall findings are invariant to whether or not we include *Financial Management* in our study sample. Of course, prestigious journals outside of finance also occasionally publish finance papers, such as the *American Economic Review*, *Management Science*, and most notably the *Journal of Business*, but because these journals publish so many papers not about finance, and because citation patterns in academic fields outside of finance may differ from the finance field, these journals are not included in our study.

During 1988-2005, the five finance journals published a total of 4,075 papers. We eliminate 17 Presidential Addresses of the American Finance Association meetings that are published annually in the *Journal of Finance*, two Merton Miller tributes that were published in the *Journal of Finance* in lieu of the presidential address in 2001, and 26 published conference and symposium discussions⁷ from our study sample, as these papers have only one author *by design*. By eliminating these papers, we ensure that we will not attribute solo-authored papers as getting fewer citations simply because they are presidential addresses and/or discussions. This leaves us with 4,030 papers in the final study sample.

In addition to full length papers, the study sample also contains eight notes, twelve comments, three replies, three corrections, and three introductions to special issues. These shorter papers may receive fewer citations, however, because these papers are not necessarily more or less inclined to having a greater or a fewer number of authors, we leave these papers in

the sample. However, we do recognize that it may take fewer authors to produce a shorter paper. Therefore, to eliminate any effect that this bias may have on our results, we will also conduct tests of our sample without these shorter papers.

For every paper, we record its total number of authors, its years since publication, its total number of *JF*-equivalent pages,⁸ whether or not it is primarily a theory paper, and whether or not it was the lead paper in the issue. For issues that contain presidential addresses or introductions, the first paper after the address or introduction is identified as the lead paper.

For every paper, we also record its number of citations. Our citations data come from two sources. The first source is the *Social Science Citation Index* (SSCI). Identifying the number of SSCI citations that a paper receives is the most common method of evaluating a paper's quality, value, and influence in the finance literature (e.g., see Borokhovich, Bricker, Brunanski, and Simpkins (1995), Borokhovich, Bricker, and Simpkins (2000), Schwert (1993), and Fische (1998)).⁹ The second source of citation information is *Google Scholar* (GS), which is an online search engine (www.scholar.google.com) that covers scholarly papers available across the web. GS's coverage is more extensive than SSCI's coverage, as GS covers not only the social sciences, but from all broad areas of research, and it covers not only published works, but also any unpublished working papers that are available on the web.¹⁰ For papers that are available on *Google Scholar*, the website also reports the number of times that a paper is cited by

⁷ Discussions of published papers presented at the American Finance Association conferences appeared in volumes 43, 55, and 56 of the *Journal of Finance* and discussions of published papers presented at special symposiums appeared in volumes 3 and 15 of the *Review of Financial Studies*.

⁸ Consistent with prior literature, we count the average number of words for three "typical" pages from each journal to identify *JF*-equivalent pages (e.g., see Chan, Chen, and Steiner (2002)). A "typical" page contains no footnotes, equations, graphs, tables, and headings. For example, we find that a typical *JFQA* page has 561 words, on average, as compared to the *JF* which has 582 words per typical page. Therefore, *JFQA* pages are adjusted by 561/582. *Financial Management* changed its page size after 1999; we make adjustments accordingly.

⁹ Perhaps the strongest evidence that citations are valid indicators of an academic paper's quality is Lawani and Bayer (1983).

¹⁰ <http://scholar.google.com/intl/en/scholar/about.html>

other papers in *Google Scholar*, and they even provide links to those citing papers. Both SSCI and GS citation numbers in our study sample are as of May 2006. It should be noted that papers published in the first two volumes of the *Review of Financial Studies* were not included in SSCI and so those papers are, of course, not included in our SSCI citation analysis, but those papers are included in the *Google Scholar* citation analysis. The total number of citations that a paper receives is adjusted by the number of years since the paper was published, as older papers are obviously biased to have more citations.

Summary statistics are presented in Table 1. From this table, we see that the average number of times that a paper in our sample is cited in SSCI and GS, adjusted by the years since the paper's publication, is 2.274 times and 9.794 times, respectively. The correlation coefficient between SSCI and GS citations is a highly positive 0.746, which is not surprising. This being the case, we largely expect similar results between SSCI and GS citations when we later conduct our empirical analyses. There are many papers that have never been cited, which is somewhat surprising because these papers appear in prestigious finance journals. For example, a total of 424 papers have zero SSCI citations, with 126 of those papers published during 1988-1999. Note that this observation further echoes the problem of simply using journal accept/reject decisions to assess paper quality. From Table 1, we also see that multiple-authored papers are cited more often than solo-authored papers. For example, solo-authored papers are cited 2.04 times on a year-adjusted basis, while multiple-authored papers, regardless of the total number of authors, are cited more often. The differences are statistically significant. These findings provide some initial support to the hypothesis that coauthored papers are of higher quality than solo-authored papers. However, because these differences do not control for other differences among papers, we do not focus too much on these preliminary observations.

[Insert Table 1 here]

The average number of authors on a paper is 1.99. There are 1,154 papers with one author (28.6 percent of the sample), 1,877 papers with two authors (46.6 percent of the sample), 888 papers with three authors (22.0 percent of the sample), 108 papers with four authors (2.7 percent of the sample), and only three papers with five authors (less than one percent of the sample), which is the maximum number of authors that a paper has in our sample. These numbers, in and of themselves, are telling. The majority of published papers have two authors, suggesting that authors prefer to work in twosomes. The number of papers dramatically drops when going from two authors to three authors, with the drop being quite dramatic when going from three authors to four authors. Perhaps this is where coordination and process problems become an impediment to intellectual collaboration. Alternatively, perhaps authors perceive a significant benefit to collaborating when it potentially involves cutting their individual effort by 50 percent (when going from solo-authoring to two authors), but they don't see much benefit of cutting their individual effort by 17 percent (going from two authors to three authors) or by 8 percent (going from three authors to four authors).

Years since publication, which is as of 2006, varies from 1 to 18 by design. The average paper length is 24 *JF*-equivalent pages. Purely theoretical papers and lead papers comprise 18.4 percent and 11.9 percent of our sample, respectively. Over a third of the papers in our sample are published in the *Journal of Finance*.

3. Some basic stylized facts about coauthoring in finance

Prior studies have studied coauthoring among finance academics. However, while those studies document on the incidence of coauthorship (Petry and Kerr (1981)) or how authors viewed coauthorship (Tompkins, Nathan, Hermanson, and Hermanson (1997), Schinski, Kugler,

and Wick (1998), and Holder et al. (2000)), no study provides empirical stylized facts about coauthorship in the academic finance profession. Therefore, we take this opportunity to do so.

Table 2 presents correlation coefficients between the number of authors on a paper and other variables used in our study. In addition to the number of authors variable, we also utilize a dummy variable indicating papers with more than one author. From these correlation results, a few interesting observations emerge about coauthoring in the academic finance profession. First, the prevalence of coauthoring has increased through time (the correlation coefficient between author numbers and years since publication is negative and statistically significant at the one percent level). This trend is consistent with the increasing incidence of coauthoring in other academic fields such as economics (Hudson (1996)), and across all social sciences in general (e.g., Endersby (1996)).

[Insert Table 2 here]

Second, coauthored papers are longer in length. However, the direction of causality is unclear. On the one hand, this finding could be suggesting that longer papers, those that involve a long hypothesis development, more story-telling, more mathematical derivations and/or empirical tests, require more authors to work on it. On the other hand, this finding could be suggesting that the combined wisdom of coauthors simply leads to more text being written. Third, it appears that coauthoring is less prevalent for purely theoretical papers (the correlation coefficient between author numbers and a dummy variable indicating a theory paper is negative and statistically significant). This finding may be suggesting that purely theoretical papers are less conducive to coauthoring. For example, an empirical paper could involve one person who does the statistical analysis and another person who does the writing (and, if the empirical paper

also contains theory, then the paper could also include yet another person who derives the theory). For a purely theoretical paper, this type of division of labor may not come as easily.

It appears that coauthored papers and solo-authored papers are equally likely to appear as a lead paper of an issue. We discuss this result in more detail later in the paper. Finally, it is interesting to note that papers published in the *Journal of Financial Economics* have more authors on a paper, on average, while papers published in the *Review of Financial Studies* have fewer authors on a paper, on average. Upon further investigation, we discover that the cause of these results is that the *Journal of Financial Economics* is less likely to publish purely theoretical papers (the correlation coefficient between the *JFE* dummy variable and theory dummy variable is a statistically significant -0.129) and the *Review of Financial Studies* is more likely to publish purely theoretical papers (the correlation coefficient between the *RFS* dummy variable and theory dummy variable is a statistically significant 0.186).

There seems to be some interest in the finance profession as to which authors are the most active and productive (e.g., Heck and Cooley (2005), Chan, Chen, and Steiner (2002), Chung and Cox (2001), Fische (1998), and Alexander and Mabry (1994)). Therefore, we also take this opportunity to list the most active authors in the finance profession, but in doing so, we emphasize how often these active authors have *coauthored* papers. These active authors, as defined as having 16 or more papers published in our sample, are listed in Table 3.¹¹ From Table 3, note that these active authors are often coauthors. That is, 71.4 percent of all papers in our sample are coauthored papers. However, for these most active authors, 85.9 percent of their papers are coauthored. Active authors appear to like coauthoring. Further, note also that their coauthored papers seem to be of higher quality than their solo-authored papers. That is, for most of these active authors, their coauthored papers have higher year-adjusted citation counts, on

average, than their solo-authored papers. However, given the small by-author sample sizes of solo-authored papers, and given that other differences between their coauthored and solo-authored papers are not controlled for, we do not put too much emphasis on these by-author comparisons at this point. Incidentally, the names listed here are not simply for idle curiosity. We use this information later in the paper.

[Insert Table 3 here]

Table 4 lists the 30 most SSCI-cited papers in our sample. Note that 21 of these papers are coauthored. The three most cited papers are coauthored. Eight of the ten most cited papers are coauthored. These results again suggest that coauthoring leads to higher quality papers. Again, however, this observation is merely suggestive. More insightful and meaningful results from regression analyses are discussed next.

[Insert Table 4 here]

4. Empirical results on coauthoring and paper quality

To identify the relation between intellectual collaboration and intellectual output quality we use a regression framework. In our regression models, we use a paper's number of SSCI citations or *Google Scholar* citations, each divided by the number of years since the paper was published, as a dependent variable and the number of authors on the paper as the key independent variable of interest. We are assuming that a greater number of authors is indicative of a greater extent of intellectual collaboration. Because the nature of our data is a time-series, all of our regression models also contain year-dummies (though, the results are invariant to whether or not year-dummies are included). Table 5 presents these regression results.

[Insert Table 5 here]

¹¹ Eight authors are tied with 15 papers published in our sample.

Panel A reports results using SSCI citation data and Panel B reports results using *Google Scholar* citation data. At this point, we should mention that the sample sizes are different between Panel A and Panel B because papers published in the first two volumes of the *Review of Financial Studies* do not have SSCI citations data, as mentioned earlier. From the first column of results in both panels, we see that papers with more than one author are cited more often (a dummy variable indicating papers with more than one author is statistically significant at the one percent level) and the second column of results show that citations increase as the number of authors increase. Because our year-adjusted citations count dependent variable and the number of authors independent variable are both count variables, we can directly interpret the regression's parameter coefficient between the two variables. For example, when the number of authors on a paper increases by one author the number of year-adjusted SSCI citations that the paper receives increases by 0.238, on average. Given that the average number of year-adjusted SSCI citations that a paper receives on average is 2.274, the effect that additional authors have on improving paper quality is not only statistically significant, it also seems to be economically significant. For year-adjusted *Google Scholar* citations, when the number of authors on a paper increases by one author the number of year-adjusted *Google Scholar* citations that a paper receives increases by 1.18. Given that the average number of year-adjusted *Google Scholar* citations that a paper receives is 9.794 times, we again see that the effect that coauthoring has on paper quality is economically significant. Overall, our findings here directly contradict those of Mendoff (2003) in his study of coauthoring in economics. He finds no statistically significant relation between the number of authors on a paper and the number of times that the paper is cited. Therefore, our findings are the first to support strongly the contention that intellectual

collaboration (i.e., indicated by multiple authors on a paper) leads to higher quality intellectual output (i.e., more citations).¹²

Model 3 includes the number of *JF*-equivalent pages of an article to control for the possibility that longer papers get cited more often, as longer papers potentially contain more information that can be cited (see Vandermeulen (1972) and Medoff (2003)). Because longer papers have more authors (recall that the correlation between paper length and author number is positive), we need to make sure that our finding of a positive relation between author number and citations are not being driven by a positive relation between author number and paper length. From the results in Model 3 in both panels, we do see that longer papers are cited more often, but more importantly, we see that this relation is *not* driving our primary result that the number of authors on a paper and its citations are positively related.

Model 4 includes a dummy variable indicating papers that are primarily theoretical. It is possible that because purely theoretical papers often lay the initial foundation for subsequent empirical studies, such theory papers will be cited more often than other papers. Recall that purely theoretical papers have fewer authors. Because papers with more authors are cited more often, controlling for whether or not a paper is primarily theoretical is unlikely to affect our key finding; i.e., while purely theoretical papers may be expected to have more citations, they have fewer authors. From model 4 results, we see that theory papers are actually cited less often, which runs counter to our initial expectation. More importantly, we see that coauthoring and citations remain positively related.

¹² At this point, a caveat is in order. There is the possibility that authors gratuitously self-cite. If so, then this could explain our findings. Multiple-authored papers have more authors that might gratuitously cite their own paper than solo-authored papers. Unfortunately, we know of no feasible way to eliminate self-citations from our citations data. The 4,030 papers in our sample are cited almost 87,000 times according to SSCI and over 272,000 times according to *Google Scholar*. The task of finding these citations to check for self-citation behavior is daunting. However, in our paper, we assume that if authors self-cite then they do so without bias. Note also that dropping all self-citations may not necessarily be ideal because it means that we ignore the citation decisions of those who know the work best.

Model 5 includes a dummy variable that controls for whether or not a paper is a lead paper in its issue. Whether or not a paper is a lead paper could be viewed as endogenous to a citations variable, as papers that editors view to be important and of high quality are often placed as the lead paper. Alternatively, lead papers may get cited more often because its position as the lead paper represents an endorsement from the editor, and thus gets more attention (see Borokhovitch, Bricker, and Simkins (2000) and Pinkowitz (2002) for discussions in these regards). Recall that the number of authors on a lead paper is not statistically different from the number of authors on other papers.¹³ Therefore, we do not expect that the inclusion of a lead paper dummy in our regression model will affect our key finding, and the results in Model 5 confirm this conjecture. That is, the positive relation between author number and citations remain intact even after we control for whether or not a paper is a lead paper. Not surprisingly, we also see that lead papers do get cited more often.

Model 6 includes journal dummy variables. If one journal is more difficult to get published in than another, and thus more coauthors are needed to get a paper published in that journal, and if publications in those journals lead to more citations, then we need to control for the possibility that our primary finding is being driven by these relations. However, from the results in Model 6, we see that the inclusion of journal dummy variables does not affect our main finding on the positive relation between coauthoring and citations.

¹³ Given that lead papers are often viewed as the best paper in the issue (Borokhovitch et al. (2000) and Pinkowitz (2002)), and given that collaboration appears to lead to higher quality papers, one might expect coauthored papers to be lead papers more often than solo-authored papers. Overall, we find that lead papers are coauthored 73.2 percent of the time, while other papers are coauthored 71.1 percent of the time. Lead papers have an average of 2.03 authors, while other papers have an average of 1.98 authors. These statistics suggest that coauthored papers appear as lead papers more often than solo-authored papers, however, as mentioned earlier, these differences between coauthored lead papers and solo-authored lead papers are not statistically significant. Overall, however, because a lead paper distinction represents a binary variable of quality, and because it is a distinction usually determined by one person, the editor, we do not lament on this further.

Another way to control for journal-specific effects is to run our regression models for each journal. This way, we can see if the relation between coauthoring and paper quality varies across journals. For regressions on SSCI citations, we find that the relation between coauthoring and citations are positive and statistically significant for papers published in every journal except for papers published in the *Review of Financial Studies*, which shows a positive, but not statistically significant, relation. For regressions on *Google Scholar* citations, we find a statistically significant positive relation between coauthoring and citations for papers published in the *Journal of Finance*, the *Journal of Financial Economics*, and the *Journal of Financial and Quantitative Analysis*. The relation is also positive for the *Review of Financial Studies*, but it is not statistically significant. We also run our regressions on a pooled sample of four out of five journals, by varying which four journals are pooled, and all of these regressions (including those that exclude the *Journal of Finance* which published over a third of the papers in our sample) find a positive relation between coauthoring and citations. Overall, a strong journal-specific effect does not emerge.

Model 7 combines all control variables. All previously discussed findings remain intact (albeit, the theory paper dummy, while still negatively related to year-adjusted *Google Scholar* citations, becomes statistically insignificant). This observation suggests that potential multicollinearity among our independent variables is not biasing our parameter estimates. Note also that when controlling for all variables at the same time, the parameter coefficient on the number of authors variable indicates that increasing the number of authors on a paper by one author increases the paper's year-adjusted SSCI citations by 0.208 and it increases the paper's year-adjusted *Google Scholar* citations by 1.112, on average. Therefore, even after we control

for many differences among papers, the effect of adding authors to improve paper quality remains both statistically and economically significant.

Are a handful of shorter papers driving our results? Our sample includes 29 notes, comments, replies and corrections. Most of these papers are solo-authored, and they generate fewer citations than other papers. To make sure these papers are not driving our results, we eliminate them from our sample and re-run our regression models. All of our findings remain intact. We also eliminate shorter papers from our sample, (i.e., papers less than five pages and less than ten pages), as they may have fewer authors. Again, all of our findings remain intact. A handful of shorter papers is not driving our finding on the positive relation between coauthoring and paper quality.

Are a handful of seminal papers driving our results? That is, outliers may be driving our findings. Recall from Table 4 that some of the most highly cited papers are coauthored papers and perhaps this handful of highly cited coauthored papers is driving our results. To address this possibility, we eliminate papers in the top one percent for citations (these represent 40 papers) from our sample and we re-run all of our regressions. Overall, the regression results using this reduced sample are nearly identical to what is reported. A handful of the most frequently cited papers is not driving our reported results.

Do purely theoretical papers benefit from intellectual collaboration? Recall from the correlation analysis that purely theoretical papers have fewer coauthors, on average, than other papers. Specifically, purely theoretical papers have 1.7 authors on average, while those papers with empirical content have 2.1 authors on average. This difference is statistically significant at the one percent level. We previously conjectured that the division of labor may come more easily for an empirical paper, especially for those papers that have both empirical and theoretical

content, than for a purely theoretical paper. Here, we explicitly test to see whether or not coauthoring does benefit papers with empirical content. While coauthoring is less common for purely theoretical papers, we also test to see if coauthoring benefits these papers as well. To conduct these investigations, we re-run the regression of Model 7 on separate samples of papers. One set of papers contains empirical content. The other set includes purely theoretical papers. Results are presented in Table 6.

[Insert Table 6 here]

Panel A of Table 6 shows regression results for the sample of papers with empirical content. From this Panel, we see that coauthored papers with empirics are cited more often than solo-authored papers. This finding confirms our conjecture that papers with empirics are conducive to coauthoring. This finding, of course, also suggests that intellectual collaboration on empirical papers leads to higher quality papers. Panel B of Table 5 shows regression results for the sample of purely theoretical papers. Here, we see that the relation between the number of authors on a theory paper and its citations is not statistically significant. Coauthored purely theoretical papers do *not* significantly generate more citations than solo-authored theory papers. This finding is consistent with our conjecture that purely theoretical papers are less conducive to coauthoring than are empirical papers.

4.1 Does it matter who one coauthors with?

While our results show that coauthored papers are of better quality than solo-authored papers, on average, we are not suggesting that one can randomly pick any person to coauthor with in order to produce a high quality paper. To produce a high quality coauthored paper, it probably matters with whom one coauthors. Perhaps a successful collaboration involves picking coauthors who provide complementary skills, have prior success and experience, are intelligent,

are hard-working and ambitious, and/or are simply next door. We identify two types of coauthors to see if coauthoring with them leads to high quality papers. First, we test to see if collaborating with an active, successful, and experienced author leads to high quality papers. We identify these authors as being those listed in Table 3 (i.e., authors with 16 or more papers published in our sample). Second, we test to see if collaborating with a colleague at the same institution leads to high quality papers.

4.1.1 Coauthoring with a prolific author

Earlier, from Table 3, we saw that many of the most active authors in finance are also active *coauthors*. It is very likely that collaborating with one of these successful authors, in particular, is what leads to high quality papers. To test for this possibility, we only use a subsample of all papers that are coauthored and we create a dummy variable equal to one if a paper is coauthored with at least one of the individuals listed in Table 3, otherwise the dummy variable is equal to zero. We include this dummy variable into our regression model (and we exclude the number of authors explanatory variable from the regression model as all papers in the test subsample are coauthored) to see if among coauthored papers it is important to coauthor with an active author. Regression results are reported in Table 7.

[Insert Table 7 here]

From Table 7, we see that coauthored papers that are coauthored with at least one of the authors listed in Table 3 are cited more often than other papers. Therefore, it does matter who one coauthors with. Coauthoring with successful and experienced authors leads to higher quality papers. Note that these findings are not surprising. Accomplished authors are coauthors on many papers because other authors like coauthoring with them, and one of the reasons for this is

probably because collaborating with one of these prolific and successful authors leads to higher quality papers.¹⁴

4.1.2 *Coauthoring with colleagues at the same institution*

Authors often coauthor with their colleagues at their institutions. The benefits seem obvious: these coauthors are intimately familiar with one other, they can communicate in person, and they can more easily monitor each other (i.e., they can more easily identify slacking). These benefits may lead to higher quality coauthored papers. To test for this possibility, we again use a subsample of coauthored papers only and we identify all papers that were coauthored by authors at the same institution to see if those papers are of higher quality than other papers.¹⁵

In total, 688 coauthored papers in our sample (i.e., one-quarter of our sample of coauthored papers) are papers coauthored by colleagues at the same institution. 564 of these papers are two-authored, 114 are three-authored, and 10 are four-authored. This finding suggests that being in the same physical location is conducive to coauthoring. We create a dummy variable equal to one if a paper is one of these 688 same-institution coauthored papers, otherwise the dummy variable is equal to zero. We include this dummy variable into our regression model (and we again exclude the number of authors explanatory variable from the regression model as all papers in the test subsample are coauthored) to see if among coauthored papers it is beneficial to coauthor with people at the same institution. Regression results are reported in Table 8.

[Insert Table 8 here]

From Table 8, we see that papers coauthored with colleagues at the same institution are neither of higher nor lower quality than other papers. This finding could be viewed as somewhat

¹⁴ We could measure active, experienced, or influential coauthors by how often they are cited, but note that any such measure will be mechanically related to the dependent variable, which is the number of citations.

surprising and subject to numerous interpretations, some not without controversy (for example, perhaps choosing to work with colleagues at the same institution represents drawing from an inferior and limited pool when compared to drawing a coauthor from the entire academic community). However, these surprising results are consistent with the recent findings of Kim, Morse, and Zingales (2006). They study academic authors in economics and finance and they find that for productive coauthoring to take place in the 1990s, physical access to coauthors is not nearly as important as it was during the 1970s. Cyber space provides a kind of proximity that eliminates the need for coauthors to be in the same physical space. One does not have to work with their departmental colleagues to produce a high quality paper. This is not to say, however, that collaborating with ones next door neighbor is by any means a fruitless endeavor, as such collaborations have yielded a quarter of the coauthored papers in our sample. This is nothing to sneeze at. Recall that our sample consists of papers published in the most prestigious finance journals.

At this point, a caveat is merited. It is important to recognize that coauthoring with *anyone* is *not* necessarily better than coauthoring with no one. Nor is this what our results are suggesting. Obviously, coauthors are not randomly assigned to work with each other. The decision with whom one chooses to coauthor with is an endogenous one. That is, coauthors choose to collaborate with each other for a reason and whatever that reason is it seems validated, as coauthored papers appear to be of higher quality than solo-authored papers.

4.2 *Is the relation between a paper's quality and its number of authors monotonic?*

So far, we have seen that papers with more authors have higher quality. But, are four authors better than three, are three authors better than two, and are two authors better than one?

¹⁵ When authors list more than one institutional affiliation (e.g., in addition to their home institution, some authors

In other words, is the relation between a paper's quality and its number of authors a monotonic one? To answer this question, we create dummy variables indicating papers with two authors, three authors, four authors, and five authors. These dummy variables replace the number of authors variable in our regression models. Table 9 presents these regression results.

[Insert Table 9 here]

From Table 9, we see that papers with two, three, and four authors are cited more often than solo-authored papers. However, the only statistically significant difference among these parameter coefficients are between the coefficient on the four author dummy and two author dummy, and between the four author dummy and three author dummy. The parameter coefficients of the two author dummy and three author dummy are not statistically different from each other. Therefore, these results suggest that paper quality improves when going from one author to two authors, and when going from three authors to four authors, but paper quality does not improve when going from two authors to three authors. The relation between paper quality and its number of authors is not monotonic. We do not have a good explanation for this result. Perhaps papers with more than two authors are more conducive to having a free-riding coauthor, but papers with four authors are not likely to have two free-riders. Regardless, it is most important to note that papers with two-authors and three-authors are cited more often than solo-authored papers. Finally, it would nice if we could identify when the benefits of adding an author levels off. Unfortunately, however, the data do not allow us to identify this point. Only three papers in our sample have five authors. No paper in our sample has more than five authors. However, as mentioned earlier, the fact there are so few five-authored papers is telling. Perhaps this is where coordination and process costs become an impediment to collaboration.

are also affiliated with NBER), we assume that the first affiliation is their primary institution.

Are prolific duos, trios, or foursomes driving our results? From Table 9, when one sees the dummy variable results for two authors, three authors, and four authors, one might wonder if these findings are driven by papers written by prolific duos (Eugene Fama and Kenneth French will immediately come to mind to most people in the finance profession), prolific trios, and/or prolific foursomes. We conduct a careful screen of our sample to identify prolific teams of authors. As for prolific duos, Fama and French have 17 two-authored papers in our sample. Their papers are cited often. In fact, the two most cited papers in our sample are papers coauthored by Fama and French. The next closest prolific duo is Milton Harris and Artur Raviv with nine papers. There were no trios or foursomes that had eight or more papers. Though, we should mention that Andrei Shleifer is a member of eight four-authored papers that involve a total of ten different coauthors. The reason why this is worth mentioning is that we find papers with four authors are cited most often. Perhaps it is Shleifer's involvement in four-authored papers that drives this result.

To see if prolific teams are driving our results, we eliminate their papers from our sample (in particular, we eliminate all two-authored papers written by Fama and French and all four-authored papers written with Shleifer) and re-run all of our regression results. Overall, the results are qualitatively similar to the results in our table. Prolific teams, while they do of course contribute to our results, are not the only ones driving our results. Put another way, there is no significant Fama-French factor.¹⁶

5. Conclusion

When it comes to the pursuit of knowledge, which, arguably, is the most important endeavor of humankind, is it better to collaborate in this pursuit or is it better to go at it alone?

¹⁶ Yes, the pun is intended.

The answer is not straight-forward. Group decision-making theory recognizes that team work requires coordination, compromise, and a process, whereas individual endeavors do not. Further, synergies from collaboration may not materialize if they are illusory or if free-riding occurs. This paper specifically sets out to test the relation between intellectual collaboration and the quality of the intellectual output.

To conduct our test, we study academic papers published in prestigious finance journals during 1988-2005. Publishing in academic finance journals is clearly an intellectual endeavor. We use the number of authors of a paper to measure the extent of intellectual collaboration, and we use the number of citations that a paper receives as a measure of its intellectual value. Based on empirical tests, we find that papers with more authors are cited more often. This relation does not hold for purely theoretical papers. Among coauthored papers, we find that papers coauthored with a prolific author are of higher quality, suggesting that it does matter with whom one coauthors with. Coauthoring with a colleague at the same institution does not lead to higher or lower quality papers than other papers, but the collaboration does generate many published papers. Papers with four authors are cited most often.

Overall, when it comes to intellectual collaboration, our results counter the notion that “too many cooks spoil the broth.” That is, the collective wisdom, the complementary skills, and combined efforts of coauthors lead to higher quality papers. Synergies from coauthoring seem real. Coordination and process costs that might occur in coauthoring appear to get overcome. Simply put, intellectual collaboration leads to higher quality intellectual output. Note that our results also provide an important implication to academia as a whole. When assessing one’s research productivity, simply counting the number of papers that the person has published, where

papers with n authors are often counted as $1/n^{\text{th}}$ of a paper, potentially undercounts the productivity of a scholar who often coauthors.

References

- Acedo, F.J., C. Barroso, C. Casanueva, and J.L. Galán, 2006, Co-authorship in management and organizational studies: An empirical and network analysis, *Journal of Management Studies* 43, 957-983.
- Alexander, J.C. and R.H. Mabry, 1994, Relative significance of journals, authors, and articles cited in financial research, *Journal of Finance* 49, 697-712.
- Bahr, A.H. and M. Zemon, 2000, Collaborative authorship in the journal literature: Perspectives for academic librarians who wish to publish, *College & Research Libraries* 61, 410-419.
- Barnett, A.H., R.W. Ault, and D.L. Kaserman, 1988, The rising incidence of coauthorship in economics: Further Evidence, *Review of Economic and Statistics* 70, 539-543.
- Borokhovich, K.A., R.J. Bricker, K.R. Brunanski, and B.J. Simkins, 1995, Finance research productivity and influence, *Journal of Finance* 50, 1691-1717.
- Borokhovich, K.A., R.J. Bricker, and B.J. Simkins, 1999, Financial Management's success as an academic journal, *Financial Management* 28, 76-82.
- Borokhovich, K.A., R.J. Bricker, and B.J. Simkins, 2000, An analysis of finance journal impact factors, *Journal of Finance* 55, 1457-1469.
- Brown, L.D., 2005, The importance of circulating and presenting manuscripts: Evidence from the accounting literature, *Accounting Review* 80, 55-83.
- Chan, K., C. Chen, and T. Steiner, 2002, Production in the finance literature, institutional reputation, and labor mobility in academia: A global perspective, *Financial Management* 31, 131-156.
- Chung, K.H. and R.A.K. Cox, 1990, Patterns of productivity in the finance literature: A study of the bibliometric distributions, *Journal of Finance* 45, 301-309.
- Chung, K.H., R.A.K. Cox, and J. Mitchell, 2001, Citation patterns in the finance literature, *Financial Management* 30, 99-118.
- Endersby, J.W., 1996, Collaborative research in the social sciences: Multiple authorship and publication credit, *Social Science Quarterly* 77, 375-392.
- Fishe, R.P.H., 1998, What are the research standards for full professor of finance?, *Journal of Finance* 53, 1053-1079.
- Fisher, B.S., C.T. Cobane, T.M. Vander Ven, and F.T. Cullen, 1998, How many authors does it take to publish an article? Trends and patterns in political science, *PS: Political Science and Politics* 31, 847-856.

- Fisher, B.S., T.M. Vander Ven, C.T. Cobane, F.T. Cullen, and N. Williams, 1998, Trends in multiple-authored articles in criminology and criminal justice: A comparative analysis, *Journal of Criminal Justice Education* 9, 19-38.
- Fox, M.F. and C.A. Faver, 1984, Independence and cooperation in research: The motivation and costs of collaboration, *Journal of Higher Education* 55, 347-359.
- Gans J.S. and G.B. Sheperd, 1994, How are the mighty fallen: Rejected classic articles by leading economists, *Journal of Economic Perspectives* 8, 165-179.
- Hackman, J.R., 1990, *Groups That Work*, Jossey-Bass Publishers, San Francisco.
- Heck, J.L. and P.L. Cooley, 2005, Prolific authors in the finance literature: A half century of contributions, *Journal of Finance Literature* 1, 46-69.
- Holder, M.E., F.W. Langrehr, D.M. Schroeder, 2000, Finance journal coauthorship: How do coauthors in very select journals evaluate the experience?, *Financial Practice and Education* 10, 142-152.
- Hudson, J., 1996, Trends in multi-authored papers in economics, *Journal of Economic Perspectives* 10, 153-158.
- Kim, E.H., A. Morse, and L. Zingales, 2006, Are elite universities losing their competitive edge? University of Michigan working paper.
- Laban, D.N. and R.D. Tollison, 2000, Intellectual collaboration, *Journal of Political Economy* 108, 632-662.
- Lawani, S.M. and A.E. Bayer, 1983, Validity of citation criteria for assessing influence of scientific publication: New evidence with peer assessment, *Journal of the American Society for Information Science* 34, 59-66.
- Medoff, M.H., 2003, Collaboration and the quality of economics research, *Labour Economics* 10, 597-608.
- Oltheten, E. V. Theoharakis, and N.G. Travlos, 2003, Faculty perceptions and readership patterns of finance journals: A global view, *Journal of Financial and Quantitative Analysis* 40, 223-239.
- Over, R., 1982, Collaborative research and publication in psychology, *American Psychologist* 37, 996-1001.
- Petry, G.H. and H.S. Kerr, 1981, The risking incidence of coauthorship as a function of institutional reward systems, *Journal of Financial Education* 10, 78-84.

- Pinkowitz, L., 2002, Research dissemination and impact: Evidence from web site downloads, *Journal of Finance* 57, 485-499.
- Presser, S., 1980, Collaboration and the quality of research, *Social Studies of Science* 10, 95-101.
- Sauer, R.D., 1988, Estimates of the returns to quality and coauthorship in economic academia, *Journal of Political Economy* 96, 855-866.
- Schinski, M., A. Kugler, and W. Wick, 1998, Perceptions of the academic finance profession regarding publishing and the allocation of credit in coauthorship situations, *Financial Practice and Education* 8, 60-67.
- Schwert, G.W., 1993, The *Journal of Financial Economics*: A retrospective evaluation (1974-1991), *Journal of Financial Economics* 33, 369-424.
- Steiner, I.D., 1972, *Group Process and Productivity*, Academic Press, New York.
- Swidler, S. and E. Goldreyer, 1998, The value of a finance journal publication, *Journal of Finance* 53, 351-356.
- Tompkins, J.G., S. Nathan, R.H. Hermanson, and D.R. Hermanson, 1997, Coauthoring in refereed journals: Perceptions of finance faculty and department chairs, *Financial Practice and Education* 7, 47-57.
- Vandermeulen, A., 1972, Manuscripts in the maelstrom: A theory of the editorial process, *Public Choice* 13, 107-111.
- Yermack, D., 1996, Higher valuation of companies with a small board of directors, *Journal of Financial Economics* 40, 185-211.
- Zivney, T.L. and W.J. Bertin, 1992, Publish or perish: What the competition is *really* doing, *Journal of Finance* 48, 295-329.
- Zivney, T.L. and W. Reichenstein, 1994, The pecking order in finance journals, *Financial Practice and Education* 4, 77-87.

Table 1
Summary Statistics

This table presents summary statistics on papers published in the *Journal of Finance (JF)*, *Journal of Financial Economics (JFE)*, *Review of Financial Studies (RFS)*, *Journal of Financial and Quantitative Analysis (JFQA)*, and *Financial Management*, during the years 1988-2005. Years-adjusted citation numbers are the number of citations that a paper received as of May 2006 divided by the number of years since publication. The number of authors variable (n) denote the number of authors on a paper. Years since publication are as of 2006. A theory paper dummy variable is equal to one (zero) if the paper is a theory (empirical) paper. A lead paper dummy variable is equal to one if the paper is the first paper of the issue or the second paper of the issue if the first paper is a presidential address or special issue introduction, otherwise the dummy variable is equal to zero. Journal dummy variables are equal to one if the paper was published in that particular journal, otherwise it is equal to zero.

	Mean	Std. Dev.	Min	Max
Number of years-adjusted SSCI citations				
All papers	2.274	3.281	0.0	45.6
When n = 1	2.040	2.845	0.0	28.3
When n = 2	2.351	3.337	0.0	45.6
When n = 3	2.281	3.291	0.0	41.1
When n = 4	3.348	5.532	0.0	44.1
When n = 5	2.672	3.388	0.4	6.6
Number of years-adjusted <i>Google Scholar</i> citations				
All papers	9.794	15.407	0.0	257.0
When n = 1	7.948	11.143	0.0	105.2
When n = 2	10.052	15.307	0.0	234.0
When n = 3	10.778	17.392	0.0	257.0
When n = 4	15.693	26.998	0.0	184.4
When n = 5	54.476	79.740	0.0	146.0
Number of authors	1.990	0.788	1	5
Years since publication	9.195	6.278	1	18
Number of <i>JF</i> -equivalent pages	24.052	9.018	0.964	75.0
Theory paper dummy	0.184	0.388	0	1
Lead paper dummy	0.119	0.323	0	1
<i>JF</i> dummy	0.361	0.480	0	1
<i>JFE</i> dummy	0.220	0.414	0	1
<i>RFS</i> dummy	0.149	0.356	0	1
<i>JFQA</i> dummy	0.143	0.351	0	1

Table 2
Correlation Results on Number of Coauthors

This table presents correlation results between the number of authors on a paper and other variables used in our paper. The sample includes all papers published in the *Journal of Finance (JF)*, *Journal of Financial Economics (JFE)*, *Review of Financial Studies (RFS)*, *Journal of Financial and Quantitative Analysis (JFQA)*, and *Financial Management*, during the years 1988-2005. A more than 1 author dummy variable is equal to one if there is more than one author on a paper, otherwise the dummy is equal to zero. The number of authors variable denote the number of authors on a paper. Years since publication are as of 2006. A theory paper dummy variable is equal to one (zero) if the paper is a theory (empirical) paper. A lead paper dummy variable is equal to one if the paper is the first paper of the issue or the second paper of the issue if the first paper is a presidential address or special issue introduction, otherwise the dummy variable is equal to zero. Journal dummy variables are equal to one if the paper was published in that particular journal, otherwise it is equal to zero. ***, **, and * denote the correlation coefficient is statistical significance at the 1, 5, and 10 percent levels, respectively.

	More than 1 author dummy	Number of authors
Years since publication	-0.092***	-0.132***
Number of <i>JF</i> -equivalent pages	0.062***	0.063***
Theory paper dummy	-0.142***	-0.172***
Lead paper dummy	0.015	0.020
<i>JF</i> dummy	-0.001	0.002
<i>JFE</i> dummy	0.029*	0.037**
<i>RFS</i> dummy	-0.028*	-0.049***
<i>JFQA</i> dummy	-0.018	-0.029*
<i>FM</i> dummy	0.014	0.033**

Table 3
The Most Active Authors in Finance

This table lists the most active authors in finance. The criteria is based on having 16 or more papers published in the *Journal of Finance*, *Journal of Financial Economics*, *Review of Financial Studies*, *Journal of Financial and Quantitative Analysis*, and *Financial Management* during the years 1988-2005. For each author, we distinguish their papers by whether or not they are coauthored or solo-authored. With this distinction, we report the average year-adjusted number of citations per paper. SSCI denotes SSCI citations and GS denotes *Google Scholar* citations.

	Total # of papers		Avg. year-adj. # of cites per paper	
			SSCI	GS
René M. Stulz	# coauthored	27	3.926	19.330
	# solo-authored	3	9.043	19.937
Sheridan Titman	# coauthored	27	4.374	16.253
	# solo-authored	2	0.735	3.125
Francis A. Longstaff	# coauthored	17	4.032	19.209
	# solo-authored	11	1.343	3.993
Roni Michaely	# coauthored	26	2.794	14.608
	# solo-authored	1	2.070	3.940
Andrei Shleifer	# coauthored	27	13.682	63.855
	# solo-authored	0	n/a	n/a
Avanidhar Subrahmanyam	# coauthored	21	4.098	21.239
	# solo-authored	4	1.880	4.510
Eugene F. Fama	# coauthored	18	12.587	50.028
	# solo-authored	5	12.588	35.302
Josef Lakonishok	# coauthored	23	5.698	17.457
	# solo-authored	0	n/a	n/a
Campbell R. Harvey	# coauthored	18	5.181	40.078
	# solo-authored	4	6.033	17.098
Michael J. Brennan	# coauthored	18	2.548	10.532
	# solo-authored	2	0.235	2.050
John J. McConnell	# coauthored	20	3.200	9.546
	# solo-authored	0	n/a	n/a
Maureen O'Hara	# coauthored	19	3.638	17.166
	# solo-authored	1	0.720	1.720
Jeremy C. Stein	# coauthored	16	5.950	36.428
	# solo-authored	4	6.160	24.540

Kenneth R. French	# coauthored	19	12.104	47.633
	# solo-authored	0	n/a	n/a
Narasimhan Jegadeesh	# coauthored	14	4.563	18.889
	# solo-authored	5	2.246	6.882
Paul H. Schultz	# coauthored	13	3.217	8.408
	# solo-authored	6	1.925	8.782
Hendrik Bessembinder	# coauthored	11	2.548	7.578
	# solo-authored	7	2.479	8.083
David J. Denis	# coauthored	14	3.132	10.561
	# solo-authored	4	1.180	2.638
Ananth Madhavan	# coauthored	16	3.569	9.006
	# solo-authored	2	4.525	10.760
Vojislav Maksimovic	# coauthored	17	2.930	14.066
	# solo-authored	1	0.930	1.560
Thomas H. Noe	# coauthored	16	0.559	1.903
	# solo-authored	2	1.250	3.665
Kalok Chan	# coauthored	15	1.349	6.599
	# solo-authored	2	2.820	6.180
Jay R. Ritter	# coauthored	14	6.866	29.068
	# solo-authored	3	6.333	16.530
Anjan Thakor	# coauthored	11	2.223	9.243
	# solo-authored	6	0.860	2.385
Robert A. Jarrow	# coauthored	12	2.186	10.164
	# solo-authored	4	10.83	2.728
Mathew P. Richardson	# coauthored	16	2.163	8.326
	# solo-authored	0	n/a	n/a
Robert W. Vishny	# coauthored	16	17.071	71.539
	# solo-authored	0	n/a	n/a

Table 4
The 30 Most Cited Papers

This table lists the 30 most cited papers for papers published in the *Journal of Finance*, *Journal of Financial Economics*, *Review of Financial Studies*, *Journal of Financial and Quantitative Analysis*, and *Financial Management* during 1988-2005 based on the total number of SSCI citations that it received as of May 2006. For every paper, we report the author names, the year of publication, title of paper, and the journal where the paper is published (where JF, JFE, and RFS denote *Journal of Finance*, *Journal of Financial Economics*, and *Review of Financial Studies*, respectively). We also specify the number of authors on the paper.

<u>30 most cited papers based on SSCI citations</u>	<u># authors</u>
Fama, E.F. and K.R. French, 1992, The cross-section of expected stock returns, JF 47, 427-465.	2
Fama, E.F. and K.R. French, 1993, Common risk factors in the returns on stocks and bonds, JFE 33, 3-56.	2
Morck, R., A. Shleifer, and R.W. Vishny, 1988, Management ownership and market valuation: an empirical analysis, JFE 20, 293-315.	3
Fama, E.F., 1991, Efficient capital markets: II, JF 46, 1572-1617.	1
LaPorta, R., F. Lopez-de-Silanes, A. Shleifer, and R.W. Vishny, 1997, Legal determinants of external finance, JF 52, 1131-1150.	4
Shleifer A. and R.W. Vishny, A survey of corporate governance, JF 52, 737-783.	2
Weisbach, M.S., 1988, Outside directors and CEO turnover, JFE 20, 431-460.	1
Poterba, J.M. and L.H. Summers, 1988, Mean reversion in stock prices: evidence and implications, JFE 22, 27-59.	2
Glosten, L.R., R. Jagannathan, and D.E. Runkle, 1993, On the relation between the expected value and the volatility of the nominal excess return on stocks, JF 48, 1779-1801.	3
Fama, E.F. and K.R. French, 1989, Business conditions and expected returns on stocks and bonds, JFE 25, 23-49.	2
Heston, S.L., 1993, A closed-form solution for options with stochastic volatility with applications to bond and currency options, RFS 6, 327-343.	1
LaPorta, R., F. Lopez-de-Silanes, and A. Shleifer, 1999, Corporate ownership around the world, JF 54, 471-517.	3
Smith, C.W.J. and R.L. Watts, 1992, The investment opportunity set and corporate financing, dividend, and compensation policies, JFE 32, 263-292.	2
Schwert, G.W., 1989, Why does stock market volatility change over time?, JF 44, 1115-1153.	1
Fama, E.F. and K.R. French, 1988, Dividend yields and expected stock returns, JFE 22, 3-25.	2
Stulz, R.M., 1988, Managerial control of voting rights: financing policies and the market for corporate control, JFE 20, 25-54.	1
Lokonishok, J., A. Shleifer, and R.W. Vishny, 1994, Contrarian investment, extrapolation, and risk, JF 49, 1541-1578.	3
Jegadeesh, N. and S. Titman, 1993, Returns to buying winners and selling losers: implications for stock market efficiency, JF 48, 65-91.	2
R.G. Rajan, 1992, Insiders and outsiders: the choice between informed and arm's-length debt, JF 47, 1367-1400.	1
Baker, G.P., M.C. Jensen, and K.J. Murphy, 1988, Compensation and incentives: practice vs. theory, JF 43, 593-616.	3
Peterson, M.A. and R.G. Rajan, 1994, The benefits of lending relationships: evidence from small business data, JF 49, 3-37.	2
Loughran, T. and J.R. Ritter, 1995, The new issues puzzle, JF 50, 23-51.	2
McConnell, J.J. and H. Servaes, 1990, Additional evidence on equity ownership and corporate value, JFE 27, 595-612.	2
Warner, J.B., R.L. Watts, and K.H. Wruck, 1988, Stock prices and top management changes, JFE 20, 461-492.	3
Fama, E.F. and K.R. French, 1996, Multifactor explanations of asset pricing anomalies, JF 51, 55-84.	2
Engle, R.F. and V.K. Ng, 1993, Measuring and testing the impact of news on volatility, JF 48, 1749-1778.	2
Ritter, J.R., 1991, The long-run performance of initial public offerings, JF 46, 3-27.	1
Carhart, M.M., 1997, On persistence in mutual fund performance, JF 52, 57-82.	1
Harris, M. and A. Raviv, 1991, The theory of capital structure, JF 46, 297-355.	2

Table 5
Regression Results on Citations

This table presents regression results. The sample includes all papers published in the *Journal of Finance (JF)*, *Journal of Financial Economics (JFE)*, *Review of Financial Studies (RFS)*, *Journal of Financial and Quantitative Analysis (JFQA)*, and *Financial Management*, during the years 1988-2005. The dependent variable in the regression model is the number of SSCI citations that a paper receives divided by the number of years since the paper's publication (Panel A) or number of *Google Scholar* citations that a paper receives divided by the number of years since the paper's publication (Panel B). Citation numbers are the number of citations that a paper received as of May 2006. The number of authors variable denote the number of authors on a paper. A more than 1 author dummy variable is equal to one if there is more than one author on a paper, otherwise the dummy is equal to zero. A theory paper dummy variable is equal to one (zero) if the paper is a theory (empirical) paper. A lead paper dummy variable is equal to one if the paper is the first paper of the issue or the second paper of the issue if the first paper is a presidential address or special issue introduction, otherwise the dummy variable is equal to zero. Journal dummy variables are equal to one if the paper was published in that particular journal, otherwise it is equal to zero. Year dummies are included in all models. Heteroskedastic-consistent t-statistics are reported in parenthesis. ***, **, and * denote statistical significance at the 1, 5, and 10 percent levels, respectively.

[Results are reported on subsequent pages]

Panel A: Dependent variable = Year-adjusted number of SSCI citations

	(1)	(2)	(3)	(4)	(5)	(6)	(7)
Intercept	1.990*** (7.106)	1.781*** (6.067)	-0.575* (-1.926)	2.029*** (6.696)	1.680*** (5.794)	0.025 (0.100)	-1.260*** (-4.041)
More than 1 author dummy	0.343*** (3.283)						
Number of authors		0.238*** (3.353)	0.232*** (3.445)	0.194*** (2.715)	0.228*** (3.234)	0.248*** (3.647)	0.208*** (3.131)
Number of <i>JF</i> -equivalent pages			0.141*** (14.880)				0.107*** (11.056)
Theory paper dummy				-0.551*** (-4.215)			-0.434*** (-3.412)
Lead paper dummy					1.243*** (5.593)		1.007*** (5.127)
<i>JF</i> dummy						2.564*** (22.416)	2.041*** (19.972)
<i>JFE</i> dummy						2.527*** (18.879)	1.655*** (12.170)
<i>RFS</i> dummy						1.713*** (15.048)	1.417*** (11.188)
<i>JFQA</i> dummy						0.624*** (8.671)	0.697*** (9.088)
Year dummies	yes	yes	yes	yes	yes	yes	yes
No. of observations	3,986	3,986	3,986	3,986	3,986	3,986	3,986
F-value	9.43***	9.67***	40.38***	10.07***	12.60***	26.57***	41.78***
Adjusted R ²	0.037	0.038	0.158	0.042	0.052	0.124	0.204

Panel B: Dependent variable = Year-adjusted number of Google Scholar citations

	(1)	(2)	(3)	(4)	(5)	(6)	(7)
Intercept	2.973*** (5.002)	1.980** (2.400)	-7.800*** (-6.848)	2.562*** (2.931)	1.446* (1.755)	-4.597*** (-4.962)	-10.658*** (-8.623)
More than 1 author dummy	1.754*** (4.100)						
Number of authors		1.180*** (3.317)	1.155*** (3.350)	1.080*** (3.015)	1.138*** (3.253)	1.214*** (3.511)	1.112*** (3.286)
Number of <i>JF</i> -equivalent pages			0.580*** (12.827)				0.452*** (9.516)
Theory paper dummy				-1.262** (-2.156)			-0.824 (-1.389)
Lead paper dummy					5.727*** (5.473)		4.808*** (5.099)
<i>JF</i> dummy						10.166*** (20.000)	7.957*** (17.354)
<i>JFE</i> dummy						8.920*** (13.827)	5.256*** (7.913)
<i>RFS</i> dummy						6.201*** (11.399)	4.680*** (7.679)
<i>JFQA</i> dummy						1.970*** (5.268)	2.269*** (5.960)
Year dummies	yes	yes	yes	yes	yes	yes	yes
No. of observations	4,030	4,030	4,030	4,030	4,030	4,030	4,030
F-value	21.31***	21.57***	46.18***	20.67***	24.15***	31.59***	43.48***
Adjusted R ²	0.083	0.084	0.176	0.085	0.098	0.143	0.209

Table 6
Regression Results on Citations: Empirical Papers versus Purely Theoretical Papers

This table presents regression results. The sample includes all papers published in the *Journal of Finance (JF)*, *Journal of Financial Economics (JFE)*, *Review of Financial Studies (RFS)*, *Journal of Financial and Quantitative Analysis (JFQA)*, and *Financial Management*, during the years 1988-2005. The dependent variable in the regression model is the number of SSCI citations that a paper receives or the number of *Google Scholar (GS)* citations that a paper receives, divided by the number of years since the paper was published. Citation numbers are the number of citations that a paper received as of May 2006. The number of authors variable denote the number of authors on a paper. A lead paper dummy variable is equal to one if the paper is the first paper of the issue or the second paper of the issue if the first paper is a presidential address or special issue introduction, otherwise the dummy variable is equal to zero. Journal dummy variables are equal to one if the paper was published in that particular journal, otherwise it is equal to zero. Year dummies are included in the models. Panel A (B) reports results for empirical (pure theory) papers. Heteroskedastic-consistent t-statistics are reported in parenthesis. ***, **, and * denote statistical significance at the 1, 5, and 10 percent levels, respectively.

Panel A: Empirical Papers

Dependent variable:	Year-adj SSCI Cites	Year-adj GS Cites
Intercept	-1.255*** (-3.289)	-11.327*** (-8.057)
Number of authors	0.219*** (2.960)	1.168*** (3.051)
Number of <i>JF</i> -equivalent pages	0.107*** (10.389)	0.451*** (9.038)
Lead paper dummy	1.000*** (4.510)	5.096*** (4.648)
<i>JF</i> dummy	2.127*** (18.175)	8.283*** (15.762)
<i>JFE</i> dummy	1.654*** (12.197)	5.404*** (8.029)
<i>RFS</i> dummy	1.602*** (10.693)	6.037*** (8.308)
<i>JFQA</i> dummy	0.761*** (8.879)	2.489*** (5.791)
Year dummies	yes	yes
No. of observations	3,269	3,288
F-value	35.57***	37.20***
Adjusted R ²	0.203	0.209

Panel B: Purely Theoretical Papers

Dependent variable:	Year-adj SSCI Cites	Year-adj GS Cites
Intercept	-1.500*** (-3.089)	-8.589*** (-4.455)
Number of authors	0.200 (1.404)	0.785 (1.368)
Number of <i>JF</i> -equivalent pages	0.104*** (4.374)	0.449*** (3.716)
Lead paper dummy	0.932** (2.445)	3.316** (2.142)
<i>JF</i> dummy	1.537*** (8.009)	5.919*** (7.079)
<i>JFE</i> dummy	1.857*** (3.455)	5.183** (2.119)
<i>RFS</i> dummy	0.759*** (2.985)	0.763 (0.633)
<i>JFQA</i> dummy	0.227 (1.212)	0.578 (0.678)
Year dummies	yes	yes
No. of observations	717	742
F-value	8.03***	8.04***
Adjusted R ²	0.191	0.186

Table 7
Regression Results on Citations of Coauthored Papers while Identifying
Papers with Active Authors

This table presents regression results. The sample includes all coauthored papers published in the *Journal of Finance (JF)*, *Journal of Financial Economics (JFE)*, *Review of Financial Studies (RFS)*, *Journal of Financial and Quantitative Analysis (JFQA)*, and *Financial Management*, during the years 1988-2005. The dependent variable in the regression model is the number of SSCI citations that a paper receives or the number of *Google Scholar (GS)* citations that a paper receives, divided by the number of years since the paper's publication. Citation numbers are the number of citations that a paper received as of May 2006. A dummy variable indicates papers coauthored by one of the 27 most active authors (i.e., those authors with 16 or more publications in our sample). A theory paper dummy variable is equal to one (zero) if the paper is a theory (empirical) paper. A lead paper dummy variable is equal to one if the paper is the first paper of the issue, otherwise the dummy variable is equal to zero. Journal dummy variables are equal to one if the paper was published in that particular journal, otherwise it is equal to zero. Years dummies are included in the models. Heteroskedastic-consistent t-statistics are reported in parenthesis. ***, **, and * denote statistical significance at the 1, 5, and 10 percent levels, respectively.

Dependent variable:	Year-adj SSCI Cites	Year-adj GS Cites
Intercept	-0.714** (-2.017)	-9.045*** (-7.585)
Paper with active author dummy	1.949*** (7.267)	9.280*** (7.088)
Number of <i>JF</i> -equivalent pages	0.112*** (9.385)	0.518*** (8.416)
Theory paper dummy	-0.508*** (-3.102)	-1.004 (-1.241)
Lead paper dummy	0.682*** (3.045)	3.832*** (3.396)
<i>JF</i> dummy	1.791*** (14.995)	6.865*** (12.037)
<i>JFE</i> dummy	1.377*** (8.412)	3.845*** (4.710)
<i>RFS</i> dummy	1.121*** (7.162)	3.310*** (4.027)
<i>JFQA</i> dummy	0.576*** (6.040)	1.435*** (2.905)
Year dummies	yes	yes
No. of observations	2,847	2,876
F-value	36.59***	38.05***
Adjusted R ²	0.238	0.244

Table 8
Regression Results on Citations of Coauthored Papers while Identifying
Papers with Coauthors from the Same Institution

This table presents regression results. The sample includes all coauthored papers published in the *Journal of Finance* (*JF*), *Journal of Financial Economics* (*JFE*), *Review of Financial Studies* (*RFS*), *Journal of Financial and Quantitative Analysis* (*JFQA*), and *Financial Management*, during the years 1988-2005. The dependent variable in the regression model is the number of SSCI citations that a paper receives or the number of *Google Scholar* (*GS*) citations that a paper receives, divided by the number of years since the paper's publication. Citation numbers are the number of citations that a paper received as of May 2006. A dummy variable indicates papers coauthored by authors all at the same institution. A theory paper dummy variable is equal to one (zero) if the paper is a theory (empirical) paper. A lead paper dummy variable is equal to one if the paper is the first paper of the issue or the second paper of the issue if the first paper is a presidential address or special issue introduction, otherwise the dummy variable is equal to zero. Journal dummy variables are equal to one if the paper was published in that particular journal, otherwise it is equal to zero. Year dummies are included in the models. Heteroskedastic-consistent t-statistics are reported in parenthesis. ***, **, and * denote statistical significance at the 1, 5, and 10 percent levels, respectively.

Dependent variable:	Year-adj SSCI Cites	Year-adj GS Cites
Intercept	-0.826** (-2.207)	-9.518*** (-7.463)
Paper with coauthors at same institution dummy	0.043 (0.283)	-0.049 (-0.100)
Number of <i>JF</i> -equivalent pages	0.115*** (9.293)	0.534*** (8.345)
Theory paper dummy	-0.471*** (-2.753)	-0.859 (-1.020)
Lead paper dummy	0.850*** (3.637)	4.639*** (3.851)
<i>JF</i> dummy	2.051*** (16.046)	8.097*** (13.824)
<i>JFE</i> dummy	1.624*** (10.043)	5.017*** (6.107)
<i>RFS</i> dummy	1.360*** (9.095)	4.417*** (5.680)
<i>JFQA</i> dummy	0.723*** (7.713)	2.128*** (4.478)
Year dummies	yes	yes
No. of observations	2,847	2,876
F-value	29.31***	30.94***
Adjusted R ²	0.199	0.207

Table 9
Regression Results on Citations Using n-Author Dummies

This table presents regression results. The sample includes all papers published in the *Journal of Finance (JF)*, *Journal of Financial Economics (JFE)*, *Review of Financial Studies (RFS)*, *Journal of Financial and Quantitative Analysis (JFQA)*, and *Financial Management*, during the years 1988-2005. The dependent variable in the regression model is the number of SSCI citations that a paper receives or the number of *Google Scholar (GS)* citations that a paper receives, divided by number of years since the paper's publication. Citation numbers are as of May 2006. A two author dummy variable is set equal to one if there are two authors on a paper, a three author dummy variable is set equal to one if there are three authors on a paper, and so on. A theory paper dummy variable is equal to one (zero) if the paper is a theory (empirical) paper. A lead paper dummy variable is equal to one if the paper is the first paper of the issue or the second paper of the issue if the first paper is a presidential address or special issue introduction, otherwise the dummy variable is equal to zero. Journal dummy variables are equal to one if the paper was published in that particular journal, otherwise it is equal to zero. Year dummies are included in the models. Heteroskedastic-consistent t-statistics are reported in parenthesis. ***, **, and * denote statistical significance at the 1, 5, and 10 percent levels, respectively.

Dependent variable:	Year-adj SSCI Cites	Year-adj GS Cites
Intercept	-1.056*** (-3.541)	-9.528*** (-8.963)
Two authors dummy	0.203** (1.985)	1.265*** (2.933)
Three authors dummy	0.231* (1.828)	1.243** (2.112)
Four authors dummy	1.417*** (2.898)	5.900*** (2.445)
Five authors dummy	-0.323 (-0.361)	37.569 (1.058)
Number of <i>JF</i> -equivalent pages	0.108*** (11.192)	0.456*** (9.675)
Theory paper dummy	-0.441*** (-3.461)	-0.932 (-1.556)
Lead paper dummy	1.005*** (5.131)	4.651*** (5.083)
<i>JF</i> dummy	2.037*** (20.049)	7.856*** (17.407)
<i>JFE</i> dummy	1.655*** (12.165)	5.202*** (7.983)
<i>RFS</i> dummy	1.402*** (11.034)	4.604*** (7.541)
<i>JFQA</i> dummy	0.701*** (9.118)	2.253*** (5.927)
Year dummies	yes	yes
No. of observations	3,986	4,030
F-value	37.80***	39.97***
Adjusted R ²	0.205	0.213