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REPUTATION AND THE RETURNS TO QUALITY: EVIDENCE FROM ACADEME

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ABSTRACT

We examine the determinants of reputation, an inchoate indicator of regard by one's peers. The essential questions are: 1) Does the quantity of exposures affect reputation independent of their quality? and 2) Assuming that their overall quality matters for reputation, does the quality of an individual's most important exposure have an extra effect on reputation? Using a variety of evidence for academic economists, we find that the quantity of output has no impact on reputation, but some evidence that the importance of their most influential work enhances their reputation beyond its effect through a measure of overall quality. Quality rankings matter more than measures of absolute quality. Data on salaries show, on the contrary, substantial positive effects of quantity, independent of quality, and little extra effect of the most influential work. Overall the results suggest that in the market for reputation one may be judged disproportionately by quality, particularly of one's best-known work, but that salary is determined in ways different from reputation.

Keywords: quality/quantity trade-off; memory; salary determination

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I. Introduction

There has been an immense literature in economics on the formation of reputation, both of individuals and of the groups to which they belong. Most of the research has been purely theoretical, with much of the work focused on reputation arising from behavior in repeated games (see Mailath and Samuelson, 2006). Another strand of theory has focused on timing, including the dynamics of the relation of individuals' behavior and reputations and those of the firms for which they work (or the products or services they produce) (Tirole, 1996) and on the reputation-maximizing timing of the release of information (Sarafidis, 2007). Presumably reputation, defined as "overall quality or character as seen or judged by people in general," is something that develops over time in the minds of those who are judging the person, group, product, etc.[1]

Because reputation is based on perceptions of "overall quality," the appropriate prior question would seem to be what we mean by quality—what aspects of individuals' behavior contribute to quality and thus generate their reputations and those of the groups to which they belong. As such, the construction of reputation might be thought of as analogous to an implicit market in which bundled aspects of a good or service are traded for some overall price (Rosen, 1974). A "supplier" of characteristics brings them to a market, where "purchasers" (employers; the public; one's professional peers) express their preferences by assigning reputations to the suppliers. These reputations in turn produce higher monetary and non-monetary rewards for the person to whom they are attached. In this market for reputation the returns to its various determinants are created by the buyers' preferences and the ability of the existing and potential suppliers to generate those determinants. We can always identify the market "price" of the dimensions of quality; and if we can identify the separate behavior of each party, or assume that one party's behavior does not respond to the returns to various aspects of quality, we can even infer the structure of preferences for reputational quality and/or the reputation-enhancing productivity of various characteristics.

[1]Merriam-Webster Online Dictionary, June 5, 2008.

In this study we concentrate on the example of the determinants of the reputations of academic economists. Our particular focus is on how the market values both the quantity of their scholarly output and, in the spirit of the hedonic markets literature, various aspects of the quality of their output. The more specific questions are: 1) How does the quantity of publications affect the regard in which a scholar is held by his/her colleagues? 2) Do a few extremely well-regarded publications have the same reputational effect as an equally successful (in terms of its total impact on other scholars) publication list that is more diffuse? and 3) Are the determinants of reputation the same as the determinants of pecuniary returns? The answers to these specific questions about the rewards to scholars should shed some light on the general determinants of reputation, especially about how its formation is affected by the trade-offs along various dimensions of reputation-enhancing activities, as well as on the returns to reputation.

II. Thinking about Reputation

Our question is about how reputation is formed—what goes on in buyers' minds as they observe the outcomes of suppliers' efforts to generate reputations. Presumably reputation is related to memory and how the actions and sequences of suppliers' behavior produce memories in the minds of the buyers. As such, the literature on memory and learning in experimental psychology may be informative for our purposes. That literature unsurprisingly makes it clear that memory is enhanced by additional exposure. In terms of our question about the trade-offs among the dimensions of quality, however, the question is whether memory of an item within a class is better enhanced by a given number of stimuli of one item in that class or of several different items in the class. One might imagine the following experiment. Treatment 1: Show a subject a dish, glass, fork, spoon, cup and bottle in sequence for five seconds each. Treatment 2: Show a subject a dish, fork and cup in sequence for ten seconds each. When asked later to pick from among a set of different objects, say a knife, a book and a baseball, are those subjects who received Treatment 2 more or less likely to select the knife than those who received Treatment 1? If more likely, one might infer that greater exposure to fewer similar objects stimulates memory better than a more diffuse exposure. By analogy, this finding might suggest that a scholar's reputation is enhanced more by a few highly reputed articles than by a larger number of papers of equal total repute.

While this hypothetical experiment seems (to these non-psychologists) fairly straightforward, nothing quite like it has been produced in the literature on learning and memory. The fundamental work in the general area (Tulving and Thomson, 1973) demonstrated the complexities of memory and proposed a theory of "encoding specificity"—that the specifics underlying exposure to events and the keys that might lead to the retrieval of memory interact to determine how memories develop. This study led to a huge literature, none of which speaks directly to our question; but there are several studies that shed some light on it. Arnold and Lindsay (2002) imply that people will remember better if they are stimulated by exact repetition of the event rather than by variations in it. Starns and Hicks (2005) show that providing related stimuli at the same time has complementary effects on memory of each, but that this is only true if the stimuli are provided in the same learning session. In a slightly different context, the results of Kurtz and Loewenstein (2007) seem similar. Overall one might infer that these experiments support the notion that memory would be more strongly enhanced under Treatment 2 in the hypothetical experiment (and more specifically perhaps that scholarly reputation is more strongly affected by a very important publication than a series of less important works).

While there are many human endeavors in which multiple dimensions of quality might be viewed as determining rewards, there has heretofore been no direct analysis of the relative roles of different measures of quality. One area in which one might examine such effects is in sports, with (as usual) the most research having been carried out on major league baseball. While no studies have focused on our concerns, several have examined salary determination as affected by various dimensions of players' productivity. Faurot and McAllister (1992) find a negative effect of home runs on arbitrators' salary awards, once runs created are held constant; Kahn's (1993) estimates of salary determination do not suggest any extra effects of extra-base hits on salary among white batters. At least in the endeavor of professional baseball a second dimension of quality does not appear to generate additional rewards beyond those produced by overall quality.

Our particular issue is how the market reward structure for reputation, R, is affected by three dimensions of production: Quantity, and two types of quality. In the example of academic reputation, we define quantity as the number of publications, Q. We define quality as q_1, the total recognition of all of a

scholar's work by other scholars, and q_{2n}, the recognition of his/her n'th-most recognized publication (where n is some arbitrary small number, with n=1 in most of our empirical work).[2] We assume that the scholar's profession offers rewards based on reputation, with the profession being his/her professional peers, professional organization or perhaps those institutions that are potential or actual buyers of his/her services. We assume that the buyers i thus have some demand for reputation as a function of these characteristics:

(1) $R^D_i = R^D_i(Q, q_1, q_{2n})$,

with the partial derivatives $R^D_j \geq 0$ for all j dimensions of reputation-enhancing activity. The responses of reputation to its determinants show the marginal willingness of demanders to reward various dimensions of scholarly work.

By analogy the scholars whose reputations are determined in this market generally engage in activities that will maximize their reputations (and thus the returns to their activities), conditional on their abilities, by responding to the market returns to quantity and the quality dimensions. Their activities will produce an analogous set of reputational supply functions, one by each of the k scholar/participants in this reputational market:

(2) $R^S_k = R^S_k(Q, q_1, q_{2n})$,

with the $R^S_j \geq 0$ for all j. The responses in (2) show the reputational returns of an increase in particular aspects of a scholar's efforts. As is usual in hedonic models, together the i demand functions and k supply functions interact to generate a market rewards function describing the determinants of reputation:

(3) $R = R(Q, q_1, q_{2n})$, with $R_j \geq 0$ for all j.

The buyers i presumably differ in their ability to purchase reputation—those institutions that are richer will be able to buy more reputation, and will presumably be observed with a staff that has higher Q, q_1 and q_{2n}. There is no reason to assume that the R^D_i are homothetic, so that an interesting empirical exercise would try to examine how the returns to these determinants of reputation vary with the total

[2]One might for convenience analogize to baseball and think of Q as at-bats, q_1 as runs batted in and q_{21} as slugging average.

resources available to the buyers to purchase reputation.[3] Whether there is any substitution in scholars' production of reputation—whether supply functions (2) actually result from some maximizing calculations—is a more difficult question: If the returns to particular dimensions of quality differ, are scholars aware of this? Even if they are aware, and assuming that they seek to maximize their reputations, are they capable of substituting toward more highly rewarded dimensions?

III. Testing the Determinants of Reputation—Measuring Inputs and Outputs

A. General Issues

Ideally we would have measures of individuals' reputations or of some result of the reputations that they have established. One approach is based on the notion that some of the purchasers of reputation are one's peers, so that awards conferred by peers represent their assessments of a scholar's reputation. A second approach is based on the theoretical notion (Tirole, 1996) and specific empirical evidence (Ehrenberg and Hurst, 1998) that individual reputation affects collective reputation. We assume that the members of an academic collective (department) seek to avoid diminishing the collective's reputation. To accomplish this they only add those marginal members whose individual reputations are at least as high as some summary measure of the reputations of the collective's current members (e.g., Rosen, 1987; Basu, 1989, and, by analogy, the literature on the worker-managed firm going back to Ward, 1958).[4] Thus for members of collectives that are sufficiently large, a measure of individual reputation is the average reputation of the collective. Taking the same tack, the collective's reputation is an even better proxy for the reputations of its newer members—those whose reputations were recently deemed by more senior members of the collective to be sufficiently high so as not to reduce the collective's reputation.

One might argue that salary or compensation is a result of scholarly reputation and can be

[3]This view of buyers seeking to purchase reputation based on their resources predicts the relatively unsurprising result that scholars attached to richer schools will have greater reputations. This outcome arises not because the school confers reputation on the scholar, but rather because it can "purchase" the services of those scholars who are capable of generating greater reputations for themselves, which then are conferred onto the institution. This approach has the interesting prediction that, where there is greater heterogeneity in institutional resources, we should observe a steeper gradient across institutions in the extent of scholarly reputation. This prediction seems supported by work of Cardoso *et al* (2008) showing that the research success of younger American labor economists varies more with the source of their doctorate than does that of their European counterparts.

[4]The minimum size of the collective for this purpose is not clear, and in the empirical work we experiment with various cut-offs.

analyzed in the same way as the indicators already discussed. Indeed, a long literature exists in economics on the role of the quantity and quality of publications in salary determination, with citations by other scholars being the usual proxy for quality (Hamermesh *et al*, 1982; Moore *et al*, 1998, are just a few) and with counts of articles and books proxying quantity. This literature could be viewed as measuring the impacts of these indicators on another proxy for reputation, provided we assume that salaries are determined in a spot market and that professional reputation is the major determinant of salaries. The former assumption is surely incorrect, and the latter assumption is questionable. Nonetheless, we explore this additional avenue to the extent that the data allow.

B. Specific Measures

Our sample consists of full professors, in American economics departments only, and only in those departments that are included among the 88 American departments that are listed as being in the top 200 in the world by Kalaitzidakis *et al* (2003). This provides a sample of 1351 scholars. While this group obviously is a selected sample—its members had to have sufficient individual reputations to be included in this fairly elite group of institutions—there is presumably enough variation in reputation across the 88 departments that selectivity bias is not solely responsible for any results we obtain.[5]

To proxy individual reputation we develop specific representations of the general measures outlined above. The first series of measures proxies reputation by awards received. We first define *Honored* as equaling one for those sample members who received a Nobel Prize, were elected President of the American Economic Association (AEA), named a Distinguished Fellow of the AEA or received its Clark Medal (awarded biennially to an economist under age 40). A more restrictive version of this outcome excludes those who thus far had only received the Clark Medal.

The difficulty with *Honored* is that economists are extremely stingy in providing distinctions to each other—using this definition, an honor is received by only a tiny fraction of individuals even in this elite sample. A more broadly received indicator of reputation is election as a fellow of the Econometric Society. (A description of the election procedures and a discussion of the determinants of fellowship are in Hamermesh and Schmidt, 2003.) Members of our sample account for all of the fellows who are non-

[5]In the Kalaitzidakis *et al* (2003) rankings these 88 departments range from Harvard at the top to the University of Arkansas--Fayetteville at the bottom of this already selected group of institutions.

emeritus faculty in American economics departments and for nearly half of all fellows world-wide.

The second series of measures is based on the reputation of the department with which the scholar is associated. The first measure is the department's ranking in Kalaitzidakis *et al* (2003) (between 1, the highest, and 200, the lowest). [This is the best measure currently available; but, because it is based on the quality of journals in which the departments' members published between 1995 and 1999, it has problems for our purposes; it will be replaced in subsequent versions of this study by the subjective ratings of reputation compiled by the National Research Council in 2006.] The National Research Council's (1995) subjective ratings of economic faculties in 1993 are another measure of departmental reputation. With them we examine the determinants of the collective reputations of the institutions to which scholars moved, implicitly therefore proxying the lower bounds of each mobile scholar's reputation. Finally, mobility itself is only possible for those scholars whose current reputations are, in this view of institutional behavior, at least equal to the collective reputation of a department that might hire them. That being the case, we create an indicator of whether a scholar moved between 1992 and 2007 (among those who had been professionally active at least since 1986, long enough to have established a reputation that might have affected their mobility).

Salary data for individual faculty members are difficult to obtain (impossible for those at private institutions), but for 42 of the public institutions in our sample we were able to acquire data from university websites that we could use to calculate full-time academic-year salaries. Most of the data were for 2007-08, but where they were not we used $1.04^{(2007-t)}$ to inflate salaries.[6] After various consistency checks on the data we were left with usable observations on 559 economists.[7]

[6]One institution only had salary data for 2004-05, while for many, particularly the University of California system, the data were for 2006-07. In some cases it was impossible to determine if the faculty member was on a 9-month appointment, and those cases were not included in the analysis.

[7]Sixteen of the schools included here comprise the biennial survey of salaries reported for 2006-07 at http://www.eco.utexas.edu/faculty/Hamermesh/EcSalsPublicCleaned.xls . The correlation of the average salaries computed here for each school and the averages provided there is 0.89, suggesting relatively little measurement error in our compilation of salary data.

The measures of quantity and the dimensions of quality come from the *Social Science Citation Index*.[8] Social science journals are where economists publish most of their scholarly work and are thus the outlets in which they establish their reputations and in which other scholars acknowledge their influence.[9] To represent Q we take the number of different entries in a scholar's record from 1956-2007. The dimensions of quality are represented by citations, with q_1 proxied by the total citations to a scholar's works that are included in Q, and q_{2n} being the numbers of citations to the scholar's n'th most-cited work, n=1,…, 5.[10]

The other measures account for individual characteristics that may affect the measured market prices of the determinants of reputation because they may be correlated with either Q or one of the q. The first is the gender of the scholar, as some have argued (Ferber, 1986) that same-sex citation is a common practice, although others (Hamermesh and Schmidt, 2003) fail to find a disparate impact in elections to fellowship in the Econometric Society. The second is the author's place in the alphabetical list in the sample, as some (Einav and Yariv, 2006) have shown that those whose names are earlier in the alphabet tend to be favored in certain aspects of scholarly work. Finally, the year of the author's first publication included in the *SSCI* is a measure of the time s/he has had to construct a reputation.

IV. Descriptive Statistics

Table 1 presents statistics describing the outcome measures that we use to proxy reputation. The reputational ranking (again, 1 is highest) has a mean well below the average of 200 departments, partly because higher-ranked departments are larger, partly because American economics departments disproportionately comprise the higher ranks of the world-wide set of 200 institutions. The NRC ratings

[8]One might be concerned that excluding publications that are in science journals, and excluding also citations from science journals, might bias our results. It is obviously true that this exclusion generates errors; but the errors are clearly small—in a random sample of 50 observations (chosen from a consecutive section of the alphabet) the correlation between citations in the *SSCI* and total citations in the *SSCI*, *Science Citation* and *Arts and Humanities Indexes* together was 0.979, while that between citations to the most-cited paper from the two sources was 0.993.

[9]This choice seems the best among the possible ways of counting total citations and citations to individual works. One should stress, however, that Q, and thus the publications that could be cited, excludes books and working papers. The former exclusion is not important for most economists, and the latter exclusion matters little in a sample of full professors. The alternative use of the *SSCI* would be based on authors rather than publications, but the *SSCI* does not allow a convenient tabulation of a scholar's most-cited works by this method. An alternative would be to use Google Scholar or SCOPUS, but their methods of tabulation are unclear.

[10]The results of Cole and Cole (1973) make it clear that concerns that citations might measure infamy rather than fame are misplaced.

(with 5 being the maximum possible) indicate similarly that the sample members' average location is in departments that are fairly highly rated. Being honored by the Nobel Committee or the AEA has only been attained by only 3 percent of the full professors at these 88 departments, with honors, as we have defined them, having been received by individuals in only 18 different departments. Econometric Society fellows comprise 20 percent of the sample and are found in 46 of the departments included in this sample.

Table 2 contains information on the determinants of reputation that we use in our estimation. The samples here and throughout the rest of this study are restricted at least to the 1268 economists whose names could be uniquely identified in the *SSCI*.[11] The first thing to notice is the skewness of both quality measures—the means of both q_1 and the q_{2n} far exceed their medians; and the maxima are huge. The quantity measure is also highly skewed, although not nearly so much as the quality measures. The skewness of all three measures must be accounted for in the estimation. In this sample 6 percent of the members are women, roughly consistent with a recent survey (CSWEP, 2007) showing 8.3 percent females among full professors at American Ph.D.-granting institutions

Our central focus is on the role of dimensions of quality in determining reputation. If the quality measures were perfectly correlated, this would be a futile exercise. They are not, as the data shown in in the left-hand columns of Table 3 on the top 20 economists along two of the dimensions of q demonstrate. Twelve of the twenty most heavily cited members of our sample are among the top twenty in terms of the scholar's most-cited single publication; and the median q_{21} of the other eight is 835, close to the cut-off among the twenty scholars in Column (2). Obviously this information is barely more than anecdotal; and while the correlation of these two measures among all 1268 sample members on whom we have citations data is high, 0.81, the measures are far from perfectly collinear, suggesting there may be enough independent variation to allow us to examine the roles of both dimensions of quality in generating reputation.

While there is a high correlation between q_1 and q_{21}, their correlations with the number of items published is much lower—0.56 for total citations, 0.33 for q_{21}. The final columns in Table 3 list the

[11] A number of economists' names and initials were so common as to prevent the unique identification of their works in the *SSCI*. Many of these are of Chinese or Korean origin and have one of the few common family names of those countries. A few others had common Western names—e.g., Brown, Harris, Jones or Smith.

twenty authors with the most entries in the *SSCI*. Only four of these names appear on either of the other two lists in the table. The medians of q_1 and q_{21} among the other sixteen most-frequent authors are 1561 and 114, far above the sample medians, but also far below the cut-offs for the other columns in the table. Clearly, publishing papers represents a different dimension of activity from total recognition or recognition of one's best-known work.

V. Estimating the Impact of Quantity and Qualities on Reputation

A. Reputation Reflected in Awards

The first three columns of Table 4 report the results of estimating the impacts of Q and q_1 on the probability of receiving one of the rare honors available to American economists. The second three columns present estimates of the determinants of having been elected a fellow of the Econometric Society. The probits that generate the results for *Honored* all hold constant for alphabetical location and the year the scholar's first *SSCI*-indexed paper appeared, while the probits for election as an Econometric Society fellow also include the indicator for female. [12] Place in the alphabet never has a significant effect on receipt of one of these awards (and has no significant effect on any of the reputational measures discussed in this Section). Not surprisingly, being *Honored* is substantially more likely among authors whose first published paper appeared earlier—except for the Clark Medal these awards are usually for a lifetime of construction of reputation.

The results presented in Column (4) are similar to those in Column (1), as are those in Column (5) to Column (2), and (6) to Column (3). The first point to note throughout is that the number of entries, Q, never has a significant impact on reputation as measured in these two ways. Conditional on quality, having produced a lot of material adds nothing to reputation. Indeed, the effect on election as an Econometric Society fellow is negative. Quantity just does not matter for these proxies for academic distinction.

There is some evidence in Table 4 that both dimensions of quality generate reputation, as proxied by these measures, although the returns to q_{21}, conditional on q_1, are not statistically significant. There is

[12]The indicator for female is not included in these probits, because only one woman has been honored according to this measure.

also evidence that the marginal payoff to additional citations in total, or to the author's most-cited work, is diminishing: Adding quadratic terms to these probits, as shown in Columns (2) and (5), substantially increases their ability to predict the receipt of these awards.[13]

Also intriguing in Table 4 are the changes in the estimates that occur when we recognize that, except for the Nobel Prize, each of the other honors is awarded to American economists on a regular basis. Even if Q or each measure q were smaller, some American economist would have his/her reputation acknowledged by receipt of one of the AEA awards; and while it is not necessary, one might imagine that current Econometric Society fellows would continue to elect many of their American peers. Columns (3) and (6) are identical to columns (1) and (4), except that total citations and citations to the most-cited paper are replaced by the scholar's rank along each dimension (with 1 being the highest rank). In both cases the ability to predict receipt of the award is enhanced.[14] These results suggest that the market for reputation, at least as proxied by these awards, is more like a tournament than a competition in which additional production *per se* increases the chance of success (Lazear and Rosen, 1981).

B. Individual Reputation Reflected by Departmental Reputation

In this sub-section we examine how the reputation of the economics department with which an individual is affiliated is related to the quantity and quality measures that we believe determine reputation. We have argued that individuals' achievements affect collective reputation, so that the market for scholars makes the reputation of one's department a proxy for one's own reputation and thus a reflection of the roles of quantity and quality of research in generating reputation. In order to maintain the assumption that a department of a given reputation is "purchasing" scholars' attributes, we arbitrarily restrict the samples in this section to departments with at least 10 full professors (so that presumably an individual's

[13]We do not use the h-index (Hirsch, 2005). (Ranking an author's papers in descending order of their citation counts, an author's h-value indexes the paper that is ranked h'th in the order and that receives h citations. An h-index of around 35 is typical for Nobel laureates in economics.) For analytical purposes this measure has the problems that it combines quantity and quality and also fails to indicate dispersion in quality. No doubt it could be used here, but interpreting the meaning of any measured impact would be difficult.

[14]The equations in Columns (1)-(3) were re-estimated defining the outcome to exclude receipt of the Clark Medal. The results were very similar, except for an unsurprising large change in the impact of the year of a scholar's first paper. Indeed, without the Clark Medal both q_1 and q_{21} have significant positive impacts on the likelihood of being honored.

reputation has only a small part in establishing the reputation of the collective). This reduces the number of observations from 1268 to 1124 (and the number of departments to 66).[15]

The determinants of the scholarly reputation of the scholars (proxied by the reputation of their departments) are presented in Table 5. Included in all the equations but not shown in the table are the effects of alphabetical position and gender, neither of which came close to statistical significance in any of the estimates. Given the importance of size, the number of full professors in a department is held constant and is unsurprisingly highly significant in increasing a department's reputation. Column (1) presents results analogous to those in Columns (1) and (4) of Table 4, except that here we also present the estimated effect of the year of the scholar's first *SSCI*-indexed paper. The estimates show that younger authors (those whose first papers are more recent) are associated with departments with higher reputational rankings. Holding this measure constant may be important and may reflect the crucial nature of one's first publication (Siow, 1991); but the result is at least partly an artifact of the sample selection criterion we have used—full professors. Those scholars who become full professors earlier tend to be associated with schools with higher reputations.[16] Partly too it may result from higher-ranked schools having sufficient resources to buy an option by gambling on extremely promising researchers.

As with the results on reputation reflected in awards, here too Q has no impact. The estimates in Column (1) of Table 5 show that increases in both q_1 and q_{21} lead the scholar to be located in a higher-ranked department, although both effects are only marginally significant statistically. When we allow for non-constant marginal returns to the quality measures, in the estimates shown in Column (2), it is clear that there are diminishing returns to quality along both dimensions. Moreover, both linear and quadratic terms along each quality dimension are statistically significant. Implicitly, the results demonstrate that higher-ranked departments do not pay attention to the quantity of publications, but that they are concerned

[15]The crucial results in this sub-section hardly change if we restrict the sub-sample to the 892 scholars located in the 44 departments with at least 15 full professors, or if we include all 1268 observations.

[16]Dropping this measure from the regression does not greatly change the result: The coefficient on q_1 becomes -0.451 and that on q_{21} becomes -1.122.

with the quality of publications, as measured by the author's total recognition by other scholars, and also as proxied by the distinction of the scholar's best-known work.[17]

Unlike the results in the previous sub-section, there is no obvious mechanical reason to expect any relation between a scholar's rank along some quality dimension and his/her reputation, as reflected in the department with which s/he is affiliated. Departments and universities are, however, competing for prestige/students/funds, so that at least to some extent one might imagine that there are tournament aspects to the market for individuals' reputations as reflected in the ranking of their departments. To examine this possibility we re-estimated the basic equation, again proxying q_1 and q_{21} by the scholar's rank in the sample along the criteria of total citations and citations to his/her most-cited work. Comparing the results, presented in Column (3), to those in either of Columns (1) or (2), it is clear that a scholar's rank along both quality measures has a bigger impact on his/her reputation than do the numerical measures of quality. While not explicitly a tournament for reputation, the results suggest that the market for scholarly reputation along this dimension too has tournament-like characteristics along both quality dimensions.[18]

Taking this argument even further, we can expand the quality ranking measures to use both q_{21} and q_{22}, as shown in Column (4) of Table 5.[19] Both measures that proxy the quality ranking of the authors' best known works significantly raise the reputation of the school where s/he is employed. Notice too that the impact of the scholar's rank in total citations in this expanded equation is essentially zero, as is still the quantity of articles s/he has produced. What matters for reputation is the quality of the best works that an author has produced.[20]

[17]When we add an indicator for public institutions (53 of the 88 schools in the sample), there are no qualitative changes in the results in the table although, other things equal, public institutions are ranked lower.

[18]Replacing the number of publications by the author's rank in Q hardly affects the estimates of the impacts of q_1 and $q_{21;}$ but the effect of Q becomes significantly negative—authors ranking higher in total publications are significantly more likely, given the measures of quality, to be in lower-quality departments.

[19]The simple correlation between the numerical proxies for these quality measures is 0.83.

[20]The partial correlation coefficient between q_1 and the vector q_{21} through q_{25} is 0. 973, making it difficult to move beyond the estimates presented in Column (4).

Relying on the formulation in Column (3), we can examine how reputation is affected by quantity and quality at different levels of the ranking of quality. In other words, do their effects on reputation differ at the margin depending on the scholar's ability to generate reputation at different levels? To examine this we estimate quantile regressions at the 75th percentile (top quartile), the median and the 25th percentile (bottom quartile) of the quality rankings of departments. The results of the estimation are shown in Columns (5)–(7). Perhaps most interesting is the clear difference between the results at the upper quartile and the other quartile boundaries. At the upper quartile the effect of q_{21} is not statistically significant, whereas it is at the other quartiles. Moreover, the effect is smaller at the upper quartile. Implicitly, and surprisingly, additional enhancement of a scholar's reputation in the upper reaches of the quality distribution is generated more by sheer recognition than by the recognition of the scholar's best work.

In Section II we argued that our estimates are tracing out the hedonic locus between scholarly output—quantity and various dimensions of quality—and scholarly reputation. To what extent can we interpret the estimates as reflecting the preferences of buyers of quantity and quality in this reputational market? This depends on the extent to which scholars (suppliers of reputation) can substitute along the different margins of quality, and between quantity and quality. If no substitution is possible, then the estimates that we have presented of the market locus reflect the values that buyers attach to the determinants of reputation, given the fixed supply along each margin. If suppliers can substitute, the failure of the market returns to be equated at all margins (the facts that the best-known paper generates extra rewards and that quantity *per se* has no impact) suggests either that suppliers are unaware of the differential returns or that they cannot fully substitute at all margins. Either way, the possible existence of some substitution by suppliers of reputation along these margins implies that, if anything, our results understate the degree of inequality of the partial derivatives in the demand functions R^D_i .

C. Reputation Reflected in Mobility

An additional way of examining the roles of quantity and quality in generating reputation using schools' reputational ratings is to study the quality of the department into which new full professors were hired between 1992 and 2007. We assume here that the decision to hire a new full professor in this period

reflects decision-makers' beliefs that the person will add to the reputation of the department (his/her reputation is at least that of the collective's average without him/her). Accordingly, a lower-bound measure of the individual's reputation is the reputation of the department some time shortly before s/he joined it.

As a first cut at this approach we assume that moving is itself an indicator that the individual met at least the quality standards of the department that hired him/her. We assume that only those scholars whose first publication appeared before 1987 could have been eligible to be hired with tenure between 1992 and 2007 and ask how quantity or quality of scholarly output affects this admittedly weak indicator of reputation. 878 of the 1268 full professors in our usable sample presumably could have moved with tenure to the department in which they are now located. Of those eligible by this criterion for inclusion in the sub-sample, in 2007 21 percent were at departments different from the one that employed them in 1992.

In Table 6 we report the results of estimating probits describing whether one of the sub-sample members moved during this fifteen-year period, as determined by the number of publications and several dimensions of their quality. Not surprisingly, having published one's first paper more recently has a strongly significant effect on the probability that one changed jobs. This is quite consistent with declining voluntary and involuntary mobility with age. In one crucial way, however, the results differ completely from those in the previous sub-sections: Whereas the quantity of publications had no impact on the receipt of awards or one's reputation as proxied by the reputation of one's employer, the probability of moving is strongly positively related to the number of publications one has generated. This result may merely reflect the fact that movers are a doubly selected sample: While they have to meet the reputational average of the department that hires them, other scholars may have at least as high a reputation but reject mobility, either because they reject formal job offers or because it is known that they do not seek them. Alternatively, competing departments may take higher Q among younger (more mobile) scholars as a signal of their likely subsequent development of quality.

As with all the previous estimates, here too one's rank in the distributions of quality describes the outcome better than does one's absolute achievements along the dimensions of quality. Additional total

citations, q_1, do increase the likelihood of changing jobs, whether we measure it as total citations or as rank in total citations; and the effect is diminishing at the margin. Unlike the results in both previous sub-sections, however, here q_{21} reduces the likelihood of the outcome, albeit never quite statistically significantly. The probability of moving is raised only by the quantity of publications and their quality, as measured by total citations (more precisely, by one's ranking among economists in total citations).

A closer connection between reputation and quantity/quality among movers can be garnered if we examine the reputational quality of the scholar's new department before the move took place. For the scholars in our sample who moved between schools from 1992 to 2007 or who entered the job market after 1992, we thus relate the 1993 NRC quality rating to the variables included in the equations presented in Table 5, using both least-squares estimates at the means of the relationship and quantile estimates at the quartiles. The results are shown in Table 7. As in all the estimates in which we use departmental reputation as a proxy for the lower bound on the scholar's reputation, there is no relationship between reputation and the measure of quantity that we use to proxy Q. Merely writing more papers, conditional on one's total experience, does not enhance one's reputation among job-changers (although, as we saw above, it does increase one's chances of moving and perhaps of being able to move).

As the results in Columns (1)-(3) show, only q_1 significantly increases what we have identified as the lower bound of the scholar's reputation (remembering that the outcome, NRC rating, is increasing in quality, while the numerical ranking of a scholar's quality is decreasing in quality). Moreover, as in all the previous results, the marginal effects of additional quality are diminishing; and, as before, it is quality ranking rather than absolute quality that describes the outcome better. In this sub-sample, however, increasing q_{21} has essentially no effect on reputation—only the total number of citations matters.

The effects of quantity and the dimensions of quality on the scholar's reputation (as proxied by the reputation of the department that hired him/her) are not greatly different at various quartiles of the reputational distribution, but some differences are noticeable. As with the least-squares estimates, q_{21} has no significant effect on reputation, although its effect diminishes as we move down the quality distribution and is essentially zero at the 50^{th} and 25^{th} percentiles. Among movers, having produced a

stellar paper has greater reputational effects nearer the top of the distribution of academic quality. The effect of q_1, however, increases as we move down the quality distribution.

As with the estimates for the entire sample, we can interpret the results on movers in the context of the hedonic model. So long as the parameters of (1) and (2) are unchanging, or changing very slowly over time, we can again infer that the importance of q_1 and the unimportance of Q suggest either that suppliers cannot or do not substitute along these dimensions or that the demand-side effects are even larger than our estimates suggest. The only *caveat* to this conclusion is that Q does affect whether one can move—perhaps moving *per se* represents a different dimension of reputation.

D. Reputation Reflected in Salary

Although we only have salary data on 41 percent of the economists comprising our sample (and on 41 percent of those on whom we could obtain usable information on citations), this group of faculty members at public universities should be sufficiently large to allow us to explore the reflection of reputation in salary. We stress that the observations that we use in this sub-section are not a random sub-sample: Unsurprisingly, since private universities are typically higher-ranked (e.g., the leading public-university department in our sample is ranked ninth in the world, behind eight private U.S. institutions), the members of the sub-sample have fewer citations in total (median of 252 compared to 315 in Table 2), fewer citations to their most-cited paper (median of 60 compared to 73), but nearly the same number of papers (median of 22 compared to 24).[21] Moreover, we could not obtain salary information on 11 of the 53 public institutions in the sample, and those individuals on whom we have usable salary and citations data have slightly, but statistically insignificantly lower averages of Q, q_1 and q_{2n} compared to those public-school faculty on whom we do not have salary information.

Regressions of the logarithms of nine-month salaries against the same combinations of citations and publications measures used in the previous sections are shown in Columns (1)-(3) of Table 8. The usual control variables are included too, along with school fixed effects.[22] As with the reputational

[21]Indeed, the distributions of citations and numbers of publications are similar below the median, but the overall distributions have longer right tails.

[22]While the vector of fixed effects is highly significant statistically, its inclusion changes none of the inferences about the impacts of the citations and publication measures on salary. The results are also qualitatively the same if

measures, salaries are described better by ranks in citations in total and to top-cited papers than by raw numbers. Thus in the discussion we concentrate on the results in Column (3). As before, total citations have a significant positive effect on salary (remembering that a lower-numbered rank implies more total citations). The effect is not small: Going from the 25th to the 75th percentile of total citations raises salary by 27 percent, and from the 5th to the 95th by 66 percent (on a mean of $150,500).

Unlike most of the previous results, however, there is no significant additional effect of citations to the author's most-cited paper—indeed, it seems to have less of an effect on salary than citations to the scholar's other work. Moreover, unlike the results on direct measures of reputation, but like that on the chance of moving, and as shown in some studies of academic salaries, Q has a positive and statistically significant effect on salary. The effect is moderate: Using the results in Column (1), going from the 25th to the 75th (5th to the 95th) percentile of Q increases salary by 4 (10) percent), but it stands in sharp contrast to the results on reputation itself in this study.

One might be concerned that the results on salary arise simply because the sub-sample differs along quality dimensions from the overall sample. To examine this possibility, in Columns (4) and (5) of Table 8 we re-estimate the equations in Columns (3) of Table 5 and (6) of Table 4, here using the sub-sample of public university faculty on whom we have salary and citations data.[23] Comparing the estimates based on citation ranks across the tables, one sees that the impacts of total and top-cited paper citations are fairly similar with, if anything, the impact of total citations being larger in this sub-sample. The effects of citations to the top-cited paper are somewhat smaller, but not that different (with a standard error that is roughly equal to that in Table 5 once one accounts for sample size). The striking difference is in the effect of Q on departmental ranking: It has a statistically significant, but **negative** effect on reputational ranking in this sub-sample of public schools, in contrast to its complete unimportance in the overall sample. The effect of Q on reputational ranking of one's department or one's chance of election as an Econometric Society fellow is at the very least quite different from its effect on individual salaries.

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we replace the school fixed effects with the department's ranking as used in the previous sections; and the correlation of ranking with average salary is -0.72.

[23]We do not use *Honored* here, as only 6 of the 526 observations received an honor, while 63 are Econometric Society fellows.

The contrast between the effects of Q in Column (3), and in Columns (4) and (5), poses an interesting conundrum: Why should universities pay off on something—the sheer volume of production—that, as our results demonstrate, does not raise and may even reduce institutional reputation? One possibility is that those who determine salaries are unaware of citation information or do not take it into account, so that Q provides the only signal of productivity (remember that Q and the q measures are positively correlated). As one effort to examine this possibility, we surveyed individuals in the 42 departments used in this sub-section, obtaining data on whether information on recent accepted/published work, and/or recent citations, is collected for use in determining annual salary changes.[24] We obtained responses from all 42 departments, with the unsurprising result that all obtain information on publications; but only 8 departments, covering 120 of the 526 individuals included in the estimates in Table 8, obtain information on annual citations. The contrast between the results on salary and reputation may therefore simply arise from most schools ignoring citation information in salary-setting.

If the contrast arises from the failure in most institutions to obtain information on citations, we would expect in those departments that collect citations data to see that the number of publications affects salary determination less than elsewhere, while total citations have a greater effect. Adding interactions of an indicator for collecting citations data with Q, q_1 and q_{21} to Column (3) of Table 8, we find that none of the interactions has a t-statistic above one, and the vector of interactions is not statistically significant ($F(3, 515) = 0.13$). Entering each interaction term separately does not alter the conclusion. While some schools do collect citation data when salaries are determined, having that information available does not seem to alter salaries.[25]

We are left with no satisfactory explanation of the disconnect between the determinants of direct measures of reputation and the determinants of salary. One (untestable) possibility is that the same

[24]The e-mail questionnaire was: "In doing annual merit/salary reviews, what information is requested from faculty members in your Department? 1) List of articles accepted and/or published during the year—YES or NO. 2) List or count of citations during the year to published or unpublished work—YES or NO. Please delete the incorrect answer to each of these two questions."

[25]One might also guess that higher-ranked schools pay more attention to total citations, which as we showed are the major determinant of reputation, and less to Q. Re-estimating the equation in Column (3) of Table 8 (without fixed effects) by adding the department's ranking and its interactions with Q, q_1 and q_{21} generated quite insignificant parameter estimates on the interactions individually and as a group.

personality characteristics that lead scholars to churn out many papers also lead them to agitate more successfully for salary increases, either by soliciting and receiving job offers and/or by clever negotiation with their current employer. Regardless, taken together, the results suggest that salaries are affected by total citations but not by their concentration on a scholar's most-cited work. Overall, this sub-section provides no evidence of any impact of q_{21} on reputation (as proxied here by salary). This differs from its effect on more direct reputational measures. Salary is also affected by the sheer quantity of what is published, in contrast to its absence of effect on reputation in the entire sample and in a sample of public institutions.[26]

VI. Conclusions

We have used the careers of academic economists as a simulacrum for studying the determinants of reputation. Reputation is a very nebulous concept, and for that reason we have been compelled to find a number of proxies for it, none of which, we admit, could possibly capture the idea fully. Our focus has been on the relative roles of what might be characterized as the number of attempts to establish reputation, the number of actual impressions made on those who might determine one's reputation and the distribution of those impressions across their number. We proxy the number of attempts by the number of papers a scholar has published, their impressions by the number of times those published works are cited, and their distribution by the concentration of citations on one or several published papers.

Although the evidence is somewhat mixed, it appears that, at least in this example, simply attempting to establish a reputation by writing more papers has essentially no impact on subjective measures of reputation. It does, however, affect the likelihood that a scholar is able to change jobs, and it also raises salaries in the sub-sample we have used. The major determinant of reputation—what is rewarded in this particular academic reputational market—is the interest that a scholar's work generates among his/her peers. Moreover, there is some evidence that the concentration of impressions on a single piece of work—one article, in this case—generates additional increases in one's reputation. Finally, we also find evidence that this reputational market has tournament-like aspects—one's rankings along the

[26]Nor are salaries lower, other things equal, as a compensating differential for those who have better reputations: Fellowship in the Econometric Society in Column (3) of Table 8 generates a significant positive effect on salaries, other things equal; but the qualitative impacts of Q, q_1 and q_{21} are unchanged.

several dimensions of quality appear to describe one's reputation better than do one's absolute achievements along these dimensions.

While our example is obviously quite specific, the general view of a market in which various characteristics are implicitly supplied and purchased and interact to generate reputation seems useful in a variety of other labor-market contexts. Any labor market in which the participants' output can be identified would appear equally amenable to studying the quantity/quality determinants of reputation. The establishment of reputation in other academic disciplines can *mutatis mutandis* be analyzed using essentially the same methods that we have used here; and the nature of reputation in artistic/creative activities is similar enough to that in academic disciplines to make studying it using approaches like the one here worth pursuing. The main point is that the importance of various determinants of reputation in different real-world contexts can be analyzed: The study of reputation is too important to be left to the theory or laboratory experiments.

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Table 1. Means and Standard Deviations, Outcome Measures, Full Professors in Top-Rated Departments, 2007-08, N=1351

Outcome	
Reputational Ranking (1 top, 200 bottom)*	62.92 (57.20)
NRC93Quality Rating (5 highest)	3.25 (1.02)
Moved 93-07 (N=927 eligibles)	0.206
Honored	0.033
Honored (w/o Clark)	0.027
Econometric Society Fellow	0.204

*From Kalaitzidakis *et al* (2003).

Table 2. Descriptive Statistics, Personal Measures, Full Professors in Top-Rated Departments, 2007-08, N=1268

Input

			Percentile					
	Mean	**Minimum**	**5**	**25**	**50**	**75**	**95**	**Maximum**
Citations:								
q_1	708	0	29	134	315	734	2610	14232
q_{2n} : 1st Paper	154	0	10	33	73	158	510	4580
2nd Paper	85	0	6	21	44	96	270	2212
3rd Paper	61	0	3	15	33	69	195	1059
4th Paper	48	0	2	11	26	54	156	879
5th Paper	39	0	1	9	21	44	131	717
Q	32.10	1	7	14	24	39	84	283
Female	0.060							
No. of Full Professors	19.45	3	7	13	17	24	39	39

Table 3. Top 20 Authors by Citations, Citations to Most-Cited Paper, and Total Papers

AUTHOR	Total Cites	AUTHOR	Most-Cited Paper	AUTHOR	Total Papers
Stiglitz, Joseph E.	14232	White, Halbert L.	4580	Cooper, Richard N.	283
Engle, Robert F.	12301	Engle, Robert F.	3592	Phillips, Peter C.B.	279
Shleifer, Andrei	11038	Granger, Clive W.J.	3592	Smith, V. Kerry	241
Becker, Gary S.	11010	Heckman, James J.	3201	Stiglitz, Joseph E.	232
Phillips, Peter C.B.	10805	Hausman, Jerry A.	2073	Engerman, Stanley	197
Heckman, James J.	10522	Newey, Whitney K.	1781	Lave, Lester B.	185
Barro, Robert J.	9941	West, Kenneth D.	1781	Turnovsky, Stephen J.	179
Lucas, Robert E.	9630	Akerlof, George A.	1746	Brada, Josef C.	172
Granger, Clive W.J.	8966	Hansen, Lars Peter	1738	DeGregori, Thomas R.	171
White, Halbert L.	7834	Lucas, Robert E.	1681	Bhagwati, Jagdish N.	168
Ross, Stephen	7082	Becker, Gary S.	1570	Feldstein, Martin	168
Milgrom, Paul R.	6945	Bollerslev, Tim	1568	Jorgenson, Dale	165
Hausman, Jerry A.	6790	Phillips, Peter C.B.	1364	Behrman, Jere R.	164
Williamson, Oliver E.	5963	Perron, Pierre	1364	Shogren, Jason F.	163
Hansen, Lars Peter	5279	Sims, Christopher A.	1334	Fare, Rolf	162
Feldstein, Martin	5252	Nelson, Charles R.	1197	Sloan, Frank A.	160
Prescott, Edward C.	5166	Barro, Robert J.	1154	Williamson, Jeffery G.	157
Hart, Oliver	5115	Stiglitz, Joseph E.	1147	Baer, Werner	155
Bollerslev, Tim	5021	Dixit, Avinash K.	1094	Granger, Clive W.J.	154
Stock, James H.	4973	Holmstrom, Bengt R.	1063	Viscusi, W. Kip	137

Table 4. Effects of Total Citations and Most-Cited Paper on Honors, Probit Derivatives, N=1268*

	(1)	(2)	(3)	(4)	(5)	(6)
Ind. Var.:		**Honored**			**ES Fellow**	
Total Citations/1000	0.0053	0.0069		0.226	0.308	
	(3.36)	(3.03)		(6.89)	(8.04)	
(Total Citations/1000)^2		-0.00041			-0.0191	
		(2.78)			(7.41)	
Citations to Most-Cited Paper/1000	0.0060	0.0104		0.293	0.216	
	(1.06)	(1.18)		(2.22)	(1.51)	
(Citations to Most-Cited Paper/1000)^2		-0.0022			-0.0624	
		(1.11)			(1.66)	
Total Citations Rank/1000			-0.0050			-0.474
			(2.04)			(6.58)
Citations to Most-Cited Paper Rank/1000			-0.0027			-0.0943
			(1.38)			(1.53)
No. of Entries/1000	0.025	0.016	0.0081	-0.927	-1.331	-0.269
	(0.49)	(0.44)	(1.28)	(1.41)	(2.09)	(0.73)
Pseudo-R^2	0.400	0.441	0.434	0.290	0.313	0.325

*Absolute values of t-statistics in parentheses here and in Tables 5-8. Also included in the probits for *Honored* are place in the alphabet and year of first paper. The probits for fellow elections add an indicator for female.

Table 5. Effects of Total Citations and Most-Cited Paper(s) On Departmental Rankings, N = 1124

					Quantile Regressions		
					Top quartile	Median	Bottom quartile
Ind. Var.:	(1)	(2)	(3)	(4)	(5)	(6)	(7)
Total Citations/100	-0.413 (1.51)	-1.185 (2.17)					
(Total Citations/100)^2		0.0096 (2.58)					
Citations to Most-Cited Paper/100	-1.285 (1.47)	-3.123 (2.74)					
(Citations to Most-Cited Paper/100)^2		0.0667 (2.76)					
Total Citations Rank			0.0179 (1.70)	-0.0021 (0.12)	0.0141 (2.48)	0.0101 (0.95)	0.0317 (2.47)
Citations to Most-Cited Paper Rank			0.0282 (2.22)	0.0198 (1.99)	0.0057 (1.16)	0.0284 (2.95)	0.0380 (3.15)
Citations to Second-Most Cited Paper Rank				0.0281 (1.79)			
No. of Entries/100	-1.265 (0.19)	1.527 (0.22)	3.561 (0.70)	1.240 (0.25)	-1.656 (0.48)	-0.873 (0.14)	9.532 (1.33)
Year of 1st Paper	-0.413 (2.58)	-0.496 (3.12)	-0.561 (3.50)	-0.552 (3.46)	-0.380 (4.10)	-0.549 (3.42)	-0.862 (4.73)
No. of Full Professors	-2.928 (5.61)	-2.716 (5.12)	-2.602 (5.27)	-2.580 (5.22)	-1.453 (18.15)	-2.181 (11.89)	-2.610 (10.51)
R^2	0.308	0.329	0.372	0.375	0.156	0.233	0.277

*The sample is restricted to individuals in departments with 10 or more full professors. t-statistics based on robust standard errors in Columns (1)-(4).
Also included in the estimates here and in Tables 6 and 7 are: Rank in the alphabet and an indicator for female.

Table 6. Effects of Total Citations and Most-Cited Paper on Moving Between 1992 and 2007, Probit Derivatives, N=878

Ind. Var.:	(1)	(2)	(3)
Total Citations/1000	0.052	0.110	
	(2.62)	(3.11)	
(Total Citations/1000)^2		-0.0075	
		(3.01)	
Citations to Most-Cited Paper/1000	-0.144	0.131	
	(1.86)	(0.65)	
(Citations to Most-Cited Paper/1000)^2		-0.218	
		(1.81)	
Total Citations Rank			-0.00043
			(4.34)
Citations to Most-Cited Paper Rank			.00016
			(1.80)
No. of Entries/100	0.226	0.195	0.128
	(4.39)	(3.73)	(2.57)
Year of 1st Paper	0.0183	0.0195	0.0182
	(8.19)	(8.34)	(8.32)
Pseudo-R^2	0.112	0.143	0.157

Table 7. Effects of Total Citations and Most-Cited Paper on 1993 Departmental Rating, N = 313 Movers

				Quantile Regressions		
				Top quartile	**Median**	**Bottom quartile**
Ind. Var.:	(1)	(2)	(3)	(4)	(5)	(6)
Total Citations/1000	0.177 (1.71)	0.490 (3.36)				
(Total Citations/100)^2		-0.0216 (3.06)				
Citations to Most-Cited Paper/1000	0.0063 (0.01)	0.157 (0.22)				
(Citations to Most-Cited Paper/100)^2		-0.706 (1.59)				
Total Citations Rank			-0.00074 (1.97)	-0.00036 (1.28)	-0.00047 (1.18)	-0.00114 (2.53)
Citations to Most-Cited Paper Rank			-0.00002 (0.07)	-0.00030 (1.13)	-0.00007 (0.20)	0.00018 (0.47)
Citations to Second-Most Cited Paper Rank						
No. of Entries/100	-0.0771 (0.34)	-0.297 (1.23)	0.00369 (0.02)	0.0694 (0.38)	0.3472 (1.55)	0.198 (0.79)
Year of 1st Paper	0.0332 (3.89)	0.0390 (4.41)	0.0419 (4.52)	0.0321 (6.41)	0.0378 (5.17)	0.0578 (6.00)
No. of Full Professors	0.0761 (9.16)	0.0717 (8.73)	0.0756 (9.18)	0.0884 (22.62)	0.0806 (12.77)	0.0615 (8.87)
R^2	0.534	0.556	0.551	0.360	0.385	0.323

*t-statistics based on robust standard errors in Columns (1)-(3).

Table 8. Effects of Total Citations and Most-Cited Paper(s) on Salary, Departmental Ranking and ES Fellow, N = 526 (42 Departments)

Dependent Variable =	**Ln(Salary)**			**Dept. Ranking**	**ES Fellow**
	(1)	(2)	(3)	(4)	(5)
Ind. Var.:					
Total Citations/100	0.0210	0.0361			
	(6.40)	(6.27)			
(Total Citations/100)^2		-0.00052			
		(4.11)			
Citations to Most-Cited Paper/100	-0.0268	-0.0248			
	(3.65)	(1.79)			
(Citations to Most-Cited Paper/100)^2		0.00090			
		(2.32)			
Total Citations Rank			-0.00043	0.0388	-0.00022
			(5.55)	(2.53)	(3.10)
Citations to Most-Cited Paper Rank			0.000098	0.0145	-0.000072
			(1.47)	(0.83)	(1.21)
No. of Entries	0.00175	0.00137	0.00138	0.326	-0.00034
	(3.36)	(2.52)	(2.62)	(2.89)	(0.74)
p-value on F-test of 42 School Fixed Effects	<.001	<.001	<.001		
R^2 or Pseudo- R^2	0.485	0.503	0.519	0.348	0.289

*Also included in all the equations are: Rank in the alphabet, an indicator for female and year of first paper. Columns (4) and (5) also include the number of full professors in the department.
t-statistics based on robust standard errors in Column (4).