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João R. Faria
University of Texas at El Paso

Franklin Mixon, Jr.
Columbus State University

Kamal Upadhyaya
University of New Haven, kupadhyaya@newhaven.edu

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Human capital and collegiality in academic beehives: Theory and analysis of European Economics faculties

João R. FARIA
University of Texas, El Paso, USA
Franklin G. MIXON, Jr.
Columbus State University, Columbus, USA
mixon_franklin@columbusstate.edu
Kamal P. UPADHYAYA
University of New Haven, West Haven, USA

Abstract. *This study investigates the importance of the quality of human capital investment and collegiality (i.e., good colleagues) in achieving the type of acclaim in economics captured by receipt of the Yrjö Jahnsson Award, arguably the second-most prestigious award that a European economist can receive as recognition of the importance of his or her research endeavors. We provide an economic model as a foundation for both qualitative and quantitative analyses. Our results indicate that four institutions, namely the Toulouse School of Economics, University College London, University of Oxford and the London School of Economics generally rank highest in supporting a position of acclaim among academic economics faculties in Europe.*

Keywords: economics research; human capital formation; collegiality; scientometrics; Yrjö Jahnsson Award.

JEL Classification: A10; A14.

1. Introduction and background

In moving from one institution to another, the late Nobel Laureate George Stigler's (1911-1991) experiences taught him that the types of academic institutions where "seniority [is] not considered an adequate substitute for interesting research" are surely unusual, if not anomalous. To Stigler, these were the types of academic institutions where the faculty engage in "that kind and intensity of scholarship" that leads to truly pioneering work, thus earning them reputations as academic "beehives" (Stigler, 1988: 46)[(1)] In their role as scholars, professional academics are not typically funded by the piece for their scholarly output, but are instead compensated in equivalent ways. For example, the higher the quality of their scholarship, the more prestigious the journal in which it will be published (Stigler, 1988: 84). The successful researcher is then hired by a more prestigious university, promoted at a rapid rate, more highly-favored by funding institutions such as the National Science Foundation, given a lighter teaching load and elected to the more learned societies (Stigler, 1988: 84-85).

The root of the type of success described above begins with formal human capital accumulation by the young scholar, primarily during his or her graduate school years. In an examination of the average quality of the PhDs trained during the 1960s by the top 36 U.S. *graduate* programs in *economics***,** Hogan (1981) finds that student quality and faculty research activity contributes positively to the quality of *graduate* training in economics.[(2)] More recently, Hilmer and Hilmer (2009) examine the role played by a PhD recipient's dissertation advisor and graduate economics program in his or her early career publishing success. Controlling for the quality of both the *student's graduate* program and dissertation advisor, they find that *students* working with prominent advisors are significantly more likely to publish in the early portion of their careers than *students* working with less prominent advisors – a result that is more remarkable when considering publications in only the top economics journals. Additional results in Hilmer and Hilmer (2009) suggest that even *students* attending lower ranked programs, but working with "superstar faculty," publish both more articles, and more articles in the top economics journals, than *their counterparts* attending top-ranked programs, but who are working with less prominent advisors.

Over time, doctoral students in economics ultimately graduate, and many find employment among the economics faculties of academic institutions. When they function at a high level, academic departments consist of faculty members committed to interacting in a collegial manner, as one's association with good colleagues provides frequent opportunities for exchanges with strong minds and powerful scientific imaginations "that have a deep understanding of the problems one is struggling with [and] are invaluable in discovering errors and eliminating strange perspectives that creep into one's work (Stigler, 1988: 36)."[(3)] Such a commitment to collegiality, and to excellence in research, becomes self-reinforcing, as scholars who are themselves committed to the endeavor are the ones who accept invitations to join the group (Stigler, 1988: 46).[(4)]

As in the case of human capital accumulation discussed above, academic research suggests that economics faculty benefit from collegiality. Laband and Tollison (2000), for

example, investigate the impact of the provision by scholars of helpful assistance (e.g., commentary, constructive criticism) on the current research of other academicians by collecting the number of individuals acknowledged in the authors' footnotes for all articles published in the *Review of Economics and Statistics* over the period 1976-1980.(5) Their analysis indicates that the scholarly impact of published research, as measured by citations to it, is a positive function of the number of helpful comments provided by others to that published research (Laband and Tollison, 2000). In a later extension, Laband and Tollison (2003) examine the authors' acknowledgements for all articles published in the three leading economics journals – *American Economic Review* (AER), *Journal of Political Economy* (JPE) and *Quarterly Journal of Economics* (QJE) – over the period 1960-1999, finding (1) that the number of commenters per paper has been generally rising over time, from a low of 124 aggregate "thanks" in 1960 to a high of 1,005 aggregate "thanks" in 1998, and (2) that the major economists over the last 20 years show up as helpful colleagues as well (Laband and Tollison, 2003).(6) Thus, this work by Laband and Tollison (2000 and 2003) is also consistent with that of Oettl (2012), which explores the idea that innovation is often the result of a communal process, wherein scientists influence the productivity of their peers, thus creating an a social dimension to innovation referred to as "helpfulness to others."(7)

Following the research outlined above, the present study extends recent work by Faria, Mixon and Upadhyaya (2016) investigating the importance of the quality of human capital investment and collegiality (i.e., good colleagues) in producing acclaimed scholars in the field of economics. In doing so, this study focuses on European economics faculties through an analysis of the probability of receiving of the Yrjö Jahnsson Award, arguably the second-most prestigious award that a European economist can receive as recognition of the importance of his or her research endeavors. Unlike Faria et al. (2016), we develop a formal approach to the subject, which is presented in the next section of this study. The formal model is followed by an exploratory analysis of the credentials of past winners of the Yrjö Jahnsson Award, particularly as they relate to the theoretical framework regarding human capital investment and collegiality presented in this study.

2. Human capital and collegiality in Economics: An economic model

To introduce our economic model, we assume that high-quality publications, P, serve as proxies for the quality of a scholar's research portfolio. Publications are an increasing function of the human capital of the author, E, given by his education and training (proxied by the PhD-granting institution), as in Hogan (1981) and Stigler (1988), and his or her professional network, N, which captures his or her area of research. Publications also increase with his or her departmental affiliation, D, because of in-house or affiliated journals (i.e., journals published by his own department or association), co-authors, students and the overall departmental environment or, as in Laband and Tollison (2000 and 2003) and Oettl (2012), collegiality,

$$P_t = F(E_t, N_t, D_t) = (E_t N_t)^{\beta} D_t^{\gamma}. \quad (1)$$

Taking the logarithm of (1) yields,

$$\ln P_t = \beta(\ln E_t + \ln N_t) + \gamma \ln D_t. \quad (2)$$

Human capital grows through education at the rate ε,

$$E_t = He^{\varepsilon t} \Rightarrow \ln E_t = \ln H + \varepsilon t. \quad (3)$$

Professional (academic) networks grow by a constant accumulation of knowledge, *nt*, and random shocks that impact research and research communities, u_t,

$$N_t = Ne^{nt+u_t} \Rightarrow \ln N_t = \ln N + nt + u_t. \quad (4)$$

The department benefits from the reputation acquired through publication of its faculty,

$$D_t = gP_{t-1} \Rightarrow \ln D_t = \ln P_{t-1} + \ln g. \quad (5)$$

Inserting (3) through (5) into (2) yields,

$$\ln P_t = \Omega + \beta(l\varepsilon + n)t + \gamma \ln P_{t-1} + \beta u_t, \quad (6)$$

where $\Omega = \beta(\ln N + \ln H) + \ln g$. Assuming that $\beta + \gamma = 1$, we have,

$$\ln P_t = \Omega + (1-\gamma)(\varepsilon + n)t + \gamma \ln P_{t-1} + (1-\gamma)u_t. \quad (7)$$

Defining,

$$y_t = \ln P_t - (\varepsilon + n)t, \quad (8)$$

yields,

$$y_t = \Omega + \gamma y_{t-1} + (1-\gamma)u_t. \quad (9)$$

Equation (9) is a first-order linear difference nonhomogeneous stochastic equation which has as a solution (Dadkhah, 2007: 510),

$$y_t = \left(y_0 - \frac{\Omega}{1-\gamma}\right)\gamma^t + \frac{\Omega}{1-\gamma} + (1-\gamma)\sum_{j=1}^{t-1}\gamma^j u_{t-j}. \quad (10)$$

As $0 < \gamma < 1$, the model is stable and fluctuations around the long-run trend, $\frac{\Omega}{1-\gamma}$, are caused by random shocks affecting academic networks. To summarize, this model explains the scholarly impact of researchers (economics faculties) as a function of PhD training, departmental affiliation (including collegiality), professional networks, growth rates of knowledge and education and random shocks affecting scientific networks and research.

In the empirical analyses that are presented in the next section of this study, Egghe's g-Index serves as proxy for the high-impact publications, *P*, that represent the impact of a scholar's research portfolio in (1) above (Egghe, 2006). Following Faria et al. (2016),

Egghe's g-Index (hereafter g-score) is a single-number metric indicating the impact of a scholar's research portfolio. It is based on the h-Index, which is equal to the number of a scholar's papers, h, that receive h or more citations (Editors, 2007).(8) As work by Egghe (2006) indicates, although the h-Index has the desirable property of lacking sensitivity to the tail of infrequently cited papers, it is at the same time relatively insensitive to the level of highly cited papers (Editors, 2007). As pointed out previously (Editors, 2007), the g-score has all the advantages and simplicity of the h-Index, while it also takes into account the performance of a scholar's most impactful publications. Egghe's g-score is the highest number g of a scholar's publications that together receive g^2 or more citations, meaning that his or her g-score will be greater than his or her h-Index, thus making clearer the difference in scholarly impact between researchers (Editors, 2007).

Of course, the production of impactful publications reflected in a high g-score ultimately leads to greater acclaim for economics faculties. With the exception of the Nobel Prize in Economic Sciences, the Yrjö Jahnsson Award is the most prestigious award that a European economist can receive. The Yrjö Jahnsson Award (hereafter YJA), is sponsored by the Yrjö Jahnsson Foundation, which is a private trust founded to promote Finnish research in economics (particularly health economics) and medicine and to support educational and research facilities.(9) The Yrjö Jahnsson Foundation was established in 1954 by Hilma Jahnsson (*1882-1975*), who provided the original capital by donating funds acquired with her husband Yrjö Jahnsson (*1877-1936*), a professor of economics.(10) The YJA began in 1993 as a biennial award "for a European economist no older than 45 years old who has made a contribution in theoretical and applied research that is significant to economics in Europe."(11) The European Economic Association (EEA) cooperates with the Yrjö Jahnsson Foundation in the selection of YJA winners, who each receive €20,000 from the Yrjö Jahnsson Foundation.(12) The link between human capital and collegiality and the production of impactful research, as well as that between impactful research production and acclaim, are the focus of the next section of the study. The analysis begins with a review of all YJA winners.

3. Human capital, collegiality, research impact and acclaim: Empirical analysis

All YJA winners through 2015 are listed, along with their time-of-award university affiliations and doctoral degree affiliations, in Table 1.(13) The first winners of the YJA are Jean-Jacques Laffont and Jean Tirole, both of whom were affiliated with the Toulouse School of Economics, which is part of the University of Toulouse Capitole (France).(14) Laffont was trained in economics at Harvard University, while Tirole received his economics training at the Massachusetts Institute of Technology (MIT).(15) The most recent winner of the YJA, Central European University's Botond Kőszegi, acquired, like Tirole, his economics training at MIT.(16) The first and only female to win the award to date is Hélène Rey, who, at the time of her recognition in 2013, was affiliated with London Business School (LBS).(17) Rey received her training in economics from the London School of Economics (LSE).(18)

Table 1. *Yrjö Jahnsson Award Winners, 1993-2015*

Name	Jahnsson Award	University Affiliation	Doctoral Affiliation
Laffont, Jean-Jacques Tirole, Jean	1993	Toulouse Toulouse	Harvard MIT
Blundell, Richard	1995	UC London	–
Persson, Torsten	1997	Stockholm	Stockholm
Kiyotaki, Nobihiro Moore, John	1999	LSE LSE	Harvard LSE
Aghion, Phillipe Tabellini, Guido	2001	UC London Bocconi	Harvard UCLA
Dewatripont, Mathias	2003	Free U Brussels	Harvard
Besley, Timothy Galí, Jordi	2005	LSE Pompeu Fabra	Oxford MIT
Saint-Paul, Gilles	2007	Toulouse	MIT
van Reenan, John Zilibotti, Fabrizio	2009	LSE Zurich	UC London LSE
Falk, Armin	2011	Bonn	Zurich
Piketty, Thomas Rey, Hélène	2013	Paris School LBS	EHESS & LSE LSE
Kőszegi, Botond	2015	CEU	MIT

Notes: LSE = London School of Economics; LBS = London Business School; CEU = Central European University

The first step in analyzing the Table 1 data in a way that is consistent with the conceptual framework developed above in this study, and with the empirical approaches in Neckermann (2008), Mixon and Upadhyayay (2008) and Faria et al. (2016), is to rank the European universities included in Table 1 on the basis of YJA medals won by these universities' economics faculties. Studies by Frey and Neckermann (2008), Mixon and Upadhyaya (2012) and Faria et al. (2016) have created a branch in the economics literature that include studies that rank economics departments on the basis of prestigious prizes and awards held by their current faculty. Specifically, Frey and Neckermann (2008) employ economists' self-reported data on a wide variety of awards contained in Blaug and Vane (2003) to construct worldwide rankings of economics departments and economists. Most recently, Faria et al. (2016) rank U.S. economics departments on the basis of John Bates Clark Medals won by economists affiliated with various university faculties.[(19)] This study follows the approach taken in the Faria et al. (2016).

The first of our rankings is consistent with the notion of ranking institutions on the basis of their success in training high-quality economics faculty, as evidenced again by YJA awards. A ranking using this approach, which we refer to as the human capital-based approach is also presented in Table 2. According to this approach, LSE retains the top-ranked European economics faculty based on the fact that it is responsible for the academic training of four YJA winners. The first of these is Moore (1999), while the most recent winner in this group is Rey (2013). The others in this group are Fabrizio Zilibotti (2009) and Thomas Piketty (2013). Rounding out the top five European universities is a four-way tie for second that includes the University of Stockholm, Zürich, Oxford and UCL. Each of these trained one of the 18 YJA winners listed in Table 1. Lastly, an alternative presentation of the human capital-based approach using simple YJA counts is a ranking based on the highest g-score of the time-of-award research portfolios of each European institution's YJA winners. That presentation is

included in the second part of Table 2, with Oxford ranking as the top European economics faculty with a g-score of 162.(20) Oxford is followed by UCL (141) in second, Zürich (126), which ranks third, and LSE (116) and Stockholm (116), which are in a two-way tie for fourth. Here, the Spearman rank correlation between the two human capital-based ranking series in Table 2 is −0.354, although it is not statistically significant at usual levels.(21)

Table 2. *Ranking Economics Faculties Using Jahnssen Awards, 1993-2015*

Human Capital-Based Approach						**Collegiality-Based Approach**					
Award Count			***Highest g-score***			***Award Count***			***Highest g-score***		
Rank	**Institution**	**Score**	**Rank**	**Institution**	**Score**	**Rank**	**Institution**	**Score**	**Rank**	**Institution**	**Score**
1	*MIT*	4	1	*MIT*	211	1	LSE	4	1	Toulouse	211
	Harvard	4	2	*Harvard*	201	2	Toulouse	3	2	UCL	201
	LSE	4	3	Oxford	162†	3	UCL	2	3	Pompeu Fabra	174†
4	Stockholm	1	4	*UCLA*	150†	4	Bocconi	1	4	LSE	162
	Zürich	1	5	UCL	141†		Free U Brussels	1	5	Bocconi	150†
	Oxford	1	6	Zürich	127†		Pompeu Fabra	1	6	Bonn	127†
	UCL	1	7	LSE	116		Zürich	1	7	Paris School	116†
	UCLA	1		Stockholm	116†		Bonn	1		Stockholm	116†
							Paris School	1	9	Free U Brussels	105†
							LBS	1	10	LBS	94†
							Stockholm	1			

Notes: The universities listed in italics are American universities. † denotes institutions with a single YJA winner over the period 1993-2015.

A contrasting approach is, according to the conceptual framework discussed earlier in this study, one that compares European universities on the basis of having the type culture or collegiality necessary for supporting the development of highly-accomplished economists from among the economics faculties affiliated with these institutions. As such, this approach to ordering European universities is referred to here as the collegiality-based approach. As pointed out in the third ranking in Table 2, LSE is the leader in producing YJA winners over the 1993-2015 period, having produced four winners, beginning with Nobihiro Kiyotaki and John Moore in 1999, and ending with John van Reenan in 2009. In between these two award years is Timothy Besley's YJA in 2005.(22) Following top-ranked LSE in second place is Toulouse, with three YJA winners. In addition to Laffont and Tirole, this list includes Gilles Saint-Paul, who won the award in 2007.(23) In third place is University College London (UCL), with two YJA winners. The UCL are Richard Blundell (1995) and Phillipe Aghion (2001). Interestingly, Blundell did not complete formal doctoral-level training in economics, while Aghion received a PhD in economics from Harvard, as did the aforementioned Laffont and Kiyotaki. Finally, rounding out the top 10 European universities is an eight-way tie or fourth with one YJA winner in each case.

An alternative presentation of the collegiality-based approach using simple YJA counts is a ranking based on the highest g-score of the time-of-award research portfolios of each European institution's YJA winners. That presentation is included in the last portion of Table 2, with Toulouse ranking as the top European economics faculty with a highest g-score of 211. Rounding out the top five are UCL (201), Pompeu Fabra University (174), LSE (162) and Italy's Bocconi University (75).(24) The order of the remaining institutions in the top 10 is the University of Bonn (127), Paris School of Economics

(116), Free University of Brussels (105), LBS (94) and the University of Zürich (28).[25] Interestingly, the Spearman rank correlation between the two collegiality-based ranking series in Table 2 is +0.678, which is statistically significant at $p = 0.022$. Lastly, each of the sets of rankings in Table 2 are summarized, using average rankings, in Table 3. The summary evidence in Table 3 support for the case that Oxford, UCL and LSE again stand out among Europe's top institutions in terms of offering the quality of human capital that is conducive to producing future YJA winners, while Toulouse, LSE and UCL appear to provide the most amenable collegiality to achieving acclaim in the form of the YJA.

Table 3. *Average of Rankings of European Economics Faculties*

	Human Capital-Based Approach			Collegiality-Based Approach	
Rank	Institution	Avg Rank	Rank	Institution	Avg Rank
1	Oxford	1.5	1	Toulouse	1.5
2	UCL	2	2	LSE	2.5
3	LSE	2.5		UCL	2.5
	Zürich	2.5	4	Pompeu Fabra	3.5
5	Stockholm	3.5	5	Bocconi	4.5
			6	Bonn	5
			7	Paris	5.5
				Stockholm	5.5
			9	FUB	6.5
			10	LBS	7

A more formal exploration of the data described above in Tables 2 and 3 is undertaken next. That exploration begins with a description of the empirical methodology. Here, the tendency of the Yrjö Jahnsson Foundation, with the assistance of the European Economic Association, to support (or not support) a given YJA candidate, i, is a function of the impact of i's research portfolio at the time of the selection, where research portfolio impact is captured by the current g-score associated with i's research portfolio. This latter variable is endogenous, given that it is determined by the quality of i's human capital, as proxied by the quality of his or her doctoral training, and the level of collegiality associated with the economics faculty to which i is affiliated. In order to deal with this aspect of the analysis, we first develop the following two-equation systems (models), which treat the human capital and collegiality effects separately:

$$g\text{-}SCORE_i = \alpha + \delta_1 \text{LSE-HC}_i + \delta_2 \text{OXFORD-HC}_i + \delta_3 \text{UCL-HC}_i + \varepsilon_{i1} \quad (1a)$$

$$\text{YJA}_i = \alpha + \delta_1 g\text{-}SCORE_i + \varepsilon_{i2}. \quad (1b)$$

and,

$$g\text{-}SCORE_i = \alpha + \beta_1 \text{LSE-C}_i + \beta_2 \text{UCL-C}_i + \beta_3 \text{TOULOUSE-C}_i + \varepsilon_{i1} \quad (2a)$$

$$\text{YJA}_i = \alpha + \beta_1 g\text{-}SCORE_i + \varepsilon_{i2}, \quad (2b)$$

Above, each economist i's g-score is an endogenous variable, while all other variables are assumed to be exogenous. The variables above are defined in Table 4.

Table 4. *Variable Definitions*

Variable	Definition
g-SCORE$_i$	Current g-score of the time-of-award research portfolios of each YJA candidate, *i*, in our our sample.
LSE-HC$_i$	Dummy variable equal to 1 for each economist, *i*, in our sample who is completed doctoral training at LSE, and 0 otherwise.
OXFORD-HC$_i$	Dummy variable equal to 1 for each economist, *i*, in our sample who is completed doctoral training at Oxford, and 0 otherwise.
UCL-HC$_i$	Dummy variable equal to 1 for each economist, *i*, in our sample who is completed doctoral training at UCL, and 0 otherwise.
YJA$_i$	Dummy variable equal to 1 for each economist, *i*, in our sample who won the YJA, and 0 otherwise.
LSE-C$_i$	Dummy variable equal to 1 for each economist, *i*, in our sample who is affiliated with LSE at the time of the relevant YJA selection, and 0 otherwise.
UCL-C$_i$	Dummy variable equal to 1 for each economist, *i*, in our sample who is affiliated with UCL at the time of the relevant YJA selection, and 0 otherwise.
TOULOUSE-C$_i$	Dummy variable equal to 1 for each economist, *i*, in our sample who is affiliated with Toulouse at the time of the relevant YJA selection, and 0 otherwise.

Sources: Harzing (2007) and Authors.

4.1. Specification of the variables in (1a) through (2b)

In the first model (i.e., the human capital model), *g-SCORE*$_i$ is defined as the current g-score of the time-of-award research portfolios of each YJA candidate, *i*, in our our sample, and it is considered to be a function of the quality of one's formal human capital attainment, which is captured by having been trained in economics at one of the top three European institutions listed in Table 3. Thus, given qualitative analysis in Tables 2 and 3, it is expected that the human capital variables in the first equation of the second system – LSE-TR, OXFORD-TR and UCL-TR, which are defined in Table 4, along with the other variables – will each exhibit a positive relationship to *g-SCORE*. In the second model (i.e., the collegiality model), *g-SCORE* is considered a function of departmental affiliation (and/or professional networks) and random shocks affecting scientific networks and research (see (2a) above). The variables LSE-C, UCL-C and TOULOUSE-C, each of which is a dummy variable equal to 1 if economist *i* was affiliated with the respective university at the time of his or her YJA (for recipients) or YJA candidacy (for non-recipients), and 0 otherwise, capture the culture or collegiality represented within the economics faculties of these three institutions vis-à-vis their counterparts in our sample. Given the rankings analysis presented in Tables 2 and 3 above regarding the impact of economists who are affiliated with these institutions, each of these variables is expected to be positively related to *g-SCORE*. Lastly, the dependent variable in the second equation of each model, YJA, is expressed as a function of *g-SCORE*, which is the endogenous variable in the first equation of each system. It is expected that in each case a higher g-score will result in a greater likelihood that an economist, *i*, is awarded the YJA.

4.2. Data

Following the foundation laid in a study of John Bates Clark Medal winners by Chan, Frey, Gallus and Torgler (2014), and used recently in empirical research by Faria et al. (2016), our models are applied to data on both YJA winners and other economists who are considered to be their competitors for the YJA.(26) Given that the present study examines collegiality and human capital pertaining to various European universities whose economics either won or were eligible for past YJAs, use of the control group provided by Chan et al. (2014), and employed in Faria et al. (2016), is not feasible.

Instead, we generated an alternative control group by culling through the rolls of age-eligible editors and associate editors of two prominent European economics journals that each has a current or past relationship to the European Economics Association – *European Economic Review* (EER) and the *Journal of the European Economic Association* (JEEA). The former was established in 1969 by Elsevier, and, as a result of an agreement between Elsevier and the EEA Council, it became the official journal of the EEA in 1986, a position it would hold through 2002.(27) The EER, which continues to be published by Elsevier, is currently ranked sixteenth among all economics journals (Kalaitzidakis, Mamuneas and Stengos, 2011). The latter journal was established in 2003 as the official journal of the EEA, and it is currently ranked nineteenth among all economics journals (Kalaitzidakis et al., 2011).

In culling through the rolls of editors and associate editors of the *EEA* and *JEEA*, we sought to identify economists who had not reached the age of 45 before the first YJA was awarded in 1993, and who did not have more than a few years remaining, by 2015, before reaching the age of 45. This process resulted in providing a control group of 19 economists, which, when matched with the YJA-winning economists, creates the overall group of economists appearing in Table 5.(28)

Table 5. *YJA Winners and Potential YJA Competitors*

Aghion, Phillipe	Garcia-Peñalusa, Cecilia	Mira, Pedro	**Rey, Hèléne**
Bandiera, Oriana	Heidhues, Paul	Monacelli, Tommaso	**Saint-Paul, Gilles**
Besley, Timothy	Huck, Steffen	Nöldeke, Georg	Schmutzler, Armin
Blundell, Richard	Janeba, Eckhard	Oechssler, Jörg	Sutter, Matthias
Botticini, Maristella	**Kiyotaki, Nobuhiro**	**Persson, Torsten**	**Tabellini, Guido**
Claudio, Michelacci	**Kőszegi, Botond**	Pesendorfer, Martin	**Tirole, Jean**
Dewatripont, Mathias	**Laffont, Jean-Jacques**	**Piketty, Thomas**	Välimäki, Juuso
Falk, Armin	Leith, Campbell	Raimondos, Pascalis	Zenou, Yves
Galí, Jordi	Manzini, Paola	**van Reenen, John**	**Zilibotti, Fabrizio**

Notes: The names in bold font are YJA winners, while those in traditional font are members of a control group of potential YJA competitors culled from the lists of editors and associate editors of *European Economic Review* and *Journal of the European Economic Association*.

The "academic demographics" frequencies for the 36 economists included in our sample are provided in Table 6. As indicated there, affiliations with both LSE and UCL exist across both the YJA recipients and members of the control group (i.e., the YJA candidates), while one member of the control group received economics training from LSE. While a number of YJA winners received economics training from either Harvard or MIT, economists in the control group were trained at either Columbia University or the University of Minnesota, which are responsible for the training of three previous John Bates Clark Medal winners. Lastly, a few different European universities, such as the aforementioned Bocconi, Bonn, Stockholm and Zürich, are associated, either through affiliation, training or both, with economists on both sides of the sample listed in Table 5.

Table 6. *Academic Demographics Frequencies*

	YJA Winners		YJA Competitors	
Institution	**Training**	**Affiliation**	**Training**	**Affiliation**
LSE	3	3	1	2
Toulouse	0	3	0	0
UCL	1	2	0	1
Oxford	1	0	0	0
Aalto	0	0	0	1
Basel	0	0	0	1
Bocconi	0	1	0	2
Bonn	0	1	2	1
Boston College	0	0	1	0
CEMFI	0	0	0	2
CNRS	0	0	0	1
Cologne	0	0	0	1
Columbia	0	0	1	0
Copenhagen	0	0	0	1
ESMT	0	0	0	1
Essex	0	0	1	0
Exeter	0	0	1	0
Free U Brussels	0	1	0	0
Glasgow	0	0	0	1
Harvard	4	0	0	0
Heidelburg	0	0	1	1
Humbolt	0	0	1	0
Innsbruck	0	0	1	1
LBS	0	1	0	0
Mannheim	0	0	0	1
Minnesota	0	0	1	0
MIT	4	0	0	0
New York	0	0	1	0
Northwestern	0	0	2	0
Pantheon-Assas	0	0	1	1
Paris School	0	1	0	0
Pennsylvania	0	0	1	0
Pompeu Fabra	0	1	0	0
Rice	0	0	1	0
Southampton	0	0	0	1
St. Andrews	0	0	0	1
Stockholm	1	1	0	0
UCLA	1	0	0	0
U of London	0	0	1	0
Zürich	1	1	0	1

4.3. Estimation technique and empirical results

Treating g-scores as endogenous means that the second equation in each system, (1b) and (2b), contains an endogenous variable on the right-hand side. Thus, the use of traditional econometric methods would yield biased and inconsistent estimates (Johnston, 1962). As such, we use a two-stage estimation procedure to jointly estimate each system. There is also the consideration that although the latent dependent variable in (1b) and (2b) is a continuous variable, YJA^*, measuring the Yrjö Jahnsson Foundation's propensity (tendency), with the assistance of the European Economic Association, to select a given YJA candidate, this variable cannot be observed. What is observed, however, is an indicator of YJA^*, or the variable YJA, which is equal to 1 for each economist, *i*, in our sample who won the Yrjö Jahnsson Award, and 0 otherwise. Therefore, the latter portion

of the model should be estimated by maximum likelihood. Maddala (1983: 242-245) describes a two-stage technique for estimating a similar model that can be applied to our empirical analysis. The first step in the empirical process is to estimate (1a) and (2a) using OLS. From this procedure, we obtain predicted values of g-SCORE, which are used as regressors in (1b) and (2b), respectively.

The results from empirical tests of (1a) and (1b) above are presented in columns two and three of Table 7. As indicated there, the human capital effects included in our model explain about eight percent of the variation in the g-scores of the economists included in our sample. In this system, the positive sign (i.e., 59.90) and significance (at the 0.000 level) of UCL-HC suggests that economists who were trained at University College London during this period produced research portfolios that were on average about 60 points (on the g-Index) more impactful than those of their counterparts in the omitted category (i.e., those trained at Heidelburg, Stockholm, etc.). Although the associated parameter estimate for OXFORD-HC is relatively large (i.e., 41.90), it falls marginally outside of traditional levels of statistical significance. Lastly, the results of probit estimation of (2b) shown in Table 7 are not encouraging, indicating that the predicted value of *g-SCORE* in this system is, although positive, not significantly related to the probability that an economist in our sample wins the YJA. This parsimonious equation explains about four percent of the variation in the probability of winning the YJA among the economists in our sample.

Table 7. *Simultaneous Probit Results for Individual and Encompassing Models*

	Human Capital Model		**Collegiality Model**		**Encompassing Model**	
Variable	*g-SCORE*	YJA	*g-SCORE*	YJA	*g-SCORE*	YJA
constant	81.10 [0.000]	−2.140 [0.163]	75.25 [0.000]	−2.198 [0.043]	81.10 [0.000]	−2.108 [0.007]
pred g-SCORE	–	0.024 [0.176]	–	0.025 [0.052]	–	0.024 [0.008]
LSE-HC	14.90 [0.254]	–	–	–	26.53 [0.046]	–
OXFORD-HC	41.90 [0.159]	–	–	–	59.07 [0.077]	–
UCL-HC	59.90 [0.000]	–	–	–	82.61 [0.000]	–
LSE-C	–	–	6.750 [0.760]	–	−11.09 [0.404]	–
UCL-C	–	–	45.42 [0.193]	–	51.19 [0.148]	–
TOULOUSE-C	–	–	74.08 [0.015]	–	79.86 [0.010]	–
nobs	36	36	36	36	36	36
R^2	0.079	–	0.216	–	0.353	–
pseudo R^2	–	0.042	–	0.104	–	0.173

Note: The numbers in brackets below the parameter estimates are two-tailed *p*-values.

Next, the results from empirical tests of (2a) and (2b) above are presented in columns four and five of Table 7. As indicated there, the collegiality effects included in our model explain about 22 percent of the variation in the g-scores of the European economists included in our sample. The positive sign (i.e., 74.08) and significance (at the 0.015 level) of TOULOUSE-C suggests that economists who were affiliated with Toulouse School of Economics during this period produced research portfolios that were on average almost 75 points (on the g-Index) more impactful than those of their counterparts in the omitted

category (i.e., those affiliated with Bocconi, Bonn, etc.). As such, this finding supports the idea that the typical Toulouse economist's colleagues offered superior assistance in allowing him or her to compete for the YJA. Next, although positively signed, neither the coefficient attached to LSE-C nor that associated with UCL-C reach traditional levels of significance in the collegiality model.(29) As such, the quality of the collegiality exhibited among the economics faculties at these two universities is similar to that supporting the economics faculties affiliated with the institutions in the omitted category (i.e., those affiliated with Bocconi, Bonn, etc.). Lastly, and encouragingly, the results of probit estimation of (1b) shown in Table 7 indicate that the predicted value of *g-SCORE* is positively and significantly (at the 0.052 level) related to the probability that an economist in our sample wins the YJA. This parsimonious equation in the collegiality system explains more than 10 percent of the variation in the probability of winning the YJA among the economists in our sample.

The possibility that the lack of significance of the individual regressors in (1a)-(1b) and in (2a)-(2b) may be due to omitted variables, the human capital and collegiality approaches to explaining YJA success are combined into a single system with six individual regressors in the first equation. The results of simultaneous probit estimation of this broader system or encompassing model are reported in columns six and seven of Table 7. As indicated there, the six regressors in the combined model work to explain more than 35 percent of the variation in *g-SCORE* across the 36 European economists studied here. Also, five of the six regressors are positively related to g-*SCORE*, as expected, with four of these reaching statistical significance (at the 0.08 level or better). Each of the human capital variables – LSE-HC, OXFORD-HC and UCL-HC – retains a coefficient estimate larger than 25 and that is significant at the 0.077 level or better. These results suggest that economics training at either of these three institutions supports a significantly more impactful research portfolio than that supported by training at one of the institutions in the omitted category. At the same time, the other results indicate that Toulouse collegiality remains an important pillar in terms of supporting a YJA-worthy research portfolio.(30)

In terms of the individual effects, the simultaneous probit results suggest that University College London doctoral training has, by a small margin, the largest effect on the impact of one's research portfolio (through age 45), followed by Toulouse collegiality. Trailing Toulouse collegiality are Oxford doctoral training and LSE doctoral training. Finally, and again encouragingly, the results of probit estimation of (1b) for the encompassing model that are shown in the final column of Table 7 indicate that the predicted value of *g-SCORE* is positively and significantly (at the 0.007 level) related to the probability that an economist in our sample wins the YJA. This parsimonious equation in the collegiality system explains more than 17 percent of the variation in the probability of winning the YJA among the economists in our sample, further attesting to the efficacy of the encompassing approach.

5. Concluding remarks

This study investigates the role of human capital formation and collegiality in achieving acclaim in the field of economics. The hypotheses developed from a formal model are tested both qualitatively and quantitatively. Our results indicate that for European

economics faculties both the quality of one's human capital formation (i.e., doctoral training) and access to good colleagues (i.e., collegiality) are integral to achieving the type of acclaim in economics captured by receipt of the Yrjö Jahnsson Award, arguably the second-most prestigious award that a European economist can receive as recognition of the importance of his or her research endeavors. The empirical analysis also suggests that three institutions, namely University College London, Oxford and London School of Economics, generally rank highest in fostering development of acclaimed European economists, and that, more specifically, the collegiality that has existed within the Toulouse School of Economics ranks highest in providing the quality of support helpful in earning Europe's top economics award.

It is worth noting, in closing, that the results of this study, which are summarized just above, appear to suggest that in Europe human capital quality holds greater importance than collegiality in the determination of acclaim in economics. The recent study of the John Bates Clark Medal by Faria et al. (2016), on the other hand, suggests that in America either collegiality holds slightly greater importance than human capital quality, or that the two serve as equal paths to acclaim in economics. To the extent that such a difference exists, it could be due to a number of factors, such as faculty size, heterogeneity in graduate training and network effects. The mere possibility of such a difference, with any number of potential determinants, is easily a subject worthy of future research.

Notes

(1) The London School of Economics was, according to Stigler (1988: 46), such a place during the 1930s.

(2) Hogan (1981) explores the importance of program size, the quality of entrants and of the faculty, as measured by the faculty's published research output, in reaching conclusions about the importance of faculty research in the provision of a high-quality graduate program in economics. Stigler (1988: 35) adds that in the leading graduate economics programs, students learn primarily from one another, namely by learning to impose higher standards upon themselves in both the choice of problems to analyze and in the quality of their solutions to these problems.

(3) As Stigler (1988: 36) indicates, the collaboration among scholars that these interactions foster has been invaluable to the advancement of science.

(4) In his description of academic life at the University of Chicago, Stigler (1988: 46) notes that there was a warm camaraderie and willingness by colleagues to share one's problems even if they were not of close relevance to their own work, and that drafts of papers were read carefully and constructively, and one was expected to return the compliment (and the sharp criticisms).

(5) Authors' acknowledgements are generally contained in a footnote on the first page of a published article. Therein the author or authors recognize the names of individuals who have provided comments and criticisms of the particular study. Berg and Faria (2008) show that this practice serves as a signaling device that increases the probability of acceptance for some authors, a potential explored in Laband, Tollison and Karahan (2002) and Mixon and Sawyer (2005). Laband and Tollison (2003) also admit to the possibility of rent seeking through inclusion of journal editors in lists of thanked scholars, although their results hold after adjusting authors' acknowledgements for journal editors.

(6) It is worth noting here that, as Hollingsworth (2012) points out, what is defined as creativity in one field (e.g., the arts) may not be so in another (e.g., the sciences), with similar differences

occurring across societies at any point in time, as well as over time within a given society. Adding to the complexity is the idea that individual creativity is both influenced by personality traits and facilitated, or hindered, by the social environment (Hollingsworth, 2012).

(7) Oettl (2012) shows that the quality of research output of scientists who experience the loss (through death) of a coauthor decreases, with the magnitude of decrease depending on whether the coauthor was helpful through the provision of conceptual feedback (i.e., critique and advice) or through the provision of materials (access), scientific tools or technical work.

(8) For example, a scholar has an h-index of 31 if 31 of his n papers, for $n \geq 31$, have at least 31 citations each and the other $n - 31$ papers each have fewer than 31 citations (Editors, 2007).

(9) See www.yjs.fi/en/

(10) See www.yjs.fi/en/yrjo-jahnsson-foundation/and www.yjs.fi/en/yrjo-jahnsson-foundation/hilma-ja-yrjo-jahnsson/

(11) The first YJA was presented at the 1993 Helsinki Congress. See www.eeassoc.org/index.php?page=25

(12) See www.eeassoc.org/index.php?page=25

(13) See http://www.yjs.fi/en/seminars-and-international-contacts/yrjo-jahnsson-award-in-economics/

(14) See http://ecole.tse-fr.eu/en/history

(15) The use of the phrase "economics training", or similar phrases, throughout this study is synonymous with earning a doctorate degree in economics.

(16) Central European University (CEU), located in Budapest, is an international graduate-level university that was founded in 1991. For more on the history of CEU, see https://www.ceu.edu/about.

(17) The London Business School (LBS) is an international business school founded in 1964. For more on the history of LBS, see www.london.edu/about/facts/history#.Vumke2NcN8E.

(18) The London School of Economics (LSE), known more formally as the London School of Economics and Political Science, is a social science university that was founded in 1895.

(19) In the interim, Mixon and Upadhyaya (2012) rank U.S. economics departments on the basis of a few major awards held by current faculty. The awards examined include (1) the *Nobel Prize in Economic Sciences*, (2) the *John Bates Clark Medal*, (3) the American Economic Association's (AEA) *Distinguished Fellows Award*, and (4) the AEA's *Richard T. Ely Lecturers* series.

(20) Oxford University is the oldest university in the English-speaking world, with evidence of teaching there dating back to 1098. For more on Oxford, see https://www.ox.ac.uk/about/organisation/history?wssl=1. University College London (UCL) is a multi-disciplinary university that was founded in 1826. For more on UCL, see http://www.ucl.ac.uk/about-ucl

(21) This particular test suffers from a small sample size coupled with little variation in the award count ranking.

(22) Like Laffont, the 1993 YJA winner, Kiyotaki was trained at Harvard University, while Moore received his economics training at LSE. Besley received his economics training at the University of Oxford, and the most recent YJA winner, van Reenan, was trained at University College London (UCL).

(23) Saint-Paul earned his PhD in economics from MIT.

(24) Pompeu Fabra University, located in Spain, was founded in 1990.

(25) Zurich ranks eleventh using the g-score approach.

(26) In their study, Chan et al. (2014) examine the effect of becoming a John Bates Clark Medal recipient or an Econometric Society Fellow on subsequent performance. In doing so, they compare the career productivity of the first 27 Clark Medal winners to that of each member of a "synthetic control group" of non-recipient scholars. Their results suggest that there is a statistically significant publications and citations boost after receipt of the Clark Medal. Faria et al. (2016) employ the synthetic control group in Chan et al. (2014) to examine differences in

collegiality and human capital effects on the probability of winning the Clark Medal of various prestigious universities in the U.S.

(27) See https://www.eeassoc.org/index.php?site=JEEA&page=187

(28) Moore, a 1999 winner of the YJA, is omitted from the empirical analysis given, as a result of his common surname, the difficulty of obtaining an accurate g-score in his case.

(29) The estimate for UCL (i.e., 45.42) falls just inside the 0.200 level of significance.

(30) Although the parameter estimate for UCL climbs to 51.19 in moving from the collegiality model to the encompassing model, it reaches only the 0.15 level of significance.

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