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Returns to MBA quality: Pecuniary and non-pecuniary returns to peers, faculty, and institution quality☆

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HIGHLIGHTS

- We investigate heterogeneity in quality characteristics and returns to MBA programs.
- Multiple proxies for quality of institutions, students, and faculty are considered.
- IV, factor analysis and fixed effects help to diminish biases in estimation.
- Substantial effects of quality are found for pecuniary and non-pecuniary outcomes.

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ABSTRACT

A large literature has focused on estimating the returns to schooling and has typically done so by incorporating institutional heterogeneity in quality along merely one dimension (such as average SAT scores). Using longitudinal survey data of registrants for the GMAT exam and school level information from other sources, we create, in the context of graduate management education, multiple indices of school quality, and estimate the effect of these quality measures on multiple indicators of career success. In particular, we create quality measures of MBA programs based on: (1) institutional and curricular factors, (2) characteristics of the student body, and (3) characteristics of the faculty. We create aggregate quality indices by combining individual proxies using factor analysis. We also extend the literature by considering the effects of quality on both earnings and non-monetary outcomes, namely attainment of managerial goals relative to initial individual expectations, self-assessed skill gains, and various measures of job satisfaction. We include several unique individual control variables, and further control for unobserved heterogeneity through the use of instrumental variables and individual fixed effects. Results indicate that the quality of peers and schools may matter most for earnings. When individual fixed effects are included, estimates of quality premiums diminish somewhat, though the estimated premium associated with school quality increases, emphasizing the importance of controlling for selection into programs of varying quality. School quality is also an important predictor of several non-pecuniary outcomes.

1. Introduction

A glaring disjuncture exists in the measures of post-secondary educational quality used by consumers of higher education compared with those employed by social science researchers. Prospective students and their parents consult a proliferation of guidebooks, rankings, and on-line database services, as well as people they know with relevant personal experiences. Typically, though, economists measure latent "educational quality" with a single proxy variable, such as the mean SAT score of an institution's entering class, when considering the effect of quality on student outcomes. This simplistic approach, in addition to being subject to potential selection bias, is likely to underestimate the returns to underlying quality, as any single proxy measures quality with error.[1] Furthermore, it ignores the fundamentally multi-dimensional nature of higher education. Our goals in this paper are to estimate heterogeneity in the returns to higher education with a focus on reducing measurement error with the use of more than a dozen quality measures, to investigate specific dimensions of quality by creating indices of three main quality inputs (peers, faculty, and the institution), and to do so while addressing concerns about selection bias.

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[1] Black and Smith (2006) show this to be the norm, as well as the bias it introduces, but indicate others who use multiple measures, such as Fitzgerald (2000), Monks (2000), Zhang (2005) and Black and Smith (2004, 2006).

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Rather than focus on undergraduates, here we analyze the returns to quality for the third most commonly earned postsecondary degree, the MBA (Masters of Business Administration). Studies of returns to postsecondary degrees are rarely conducted. Attention to MBAs is especially warranted since it is the higher education degree whose value has been most criticized. [2] Five major MBA rankings exist: *Business Week*, *U.S. News & World Report*, *Wall Street Journal*, *The Economist*, and the *Financial Times*. The two most popular MBA rankings in the U.S.—*Business Week* and *U.S. News & World Report*—have a close to zero long run correlation, in part because of the large role played in each by the subjective ratings of business school deans (Dichev, 1999).[3] Dichev (1999) concludes that one should avoid a broad interpretation of the rankings as measures of unobservable "school quality," but rather interpret them more narrowly as "useful but noisy and incomplete data about school performance" (Dichev, 1999, p. 203). Our analyses also reveal close to zero and exceedingly low correlations of changes in *Business Week* and *U.S. News & World Report* MBA program rankings: 0.07 from 1990 to 2012, 0.02 from 1990 to 2000, and 0.13 from 2000 to 2012.[4]

Beyond providing many quality measures, features of our MBA data set allow us to identify the effect on earnings of education, that is to separate the returns to schooling from the effect of observed and unobserved attributes on educational choices and attainment (Brewer and Ehrenberg, 1996; Heckman, 1979).[5] Researchers use five strategies to identify causal effects: exclusion restrictions,[6] sibling and twin data sets,[7] controlling for selection with lots of observables,[8] instrumental variables,[9] and fixed effects.[10] We employ the latter three approaches. The primary data for our analysis comes from the GMAT Registrant Survey, a longitudinal survey in four waves, comprised of individuals who registered to take the Graduate Management Admission Test (GMAT), a standardized exam required by most MBA programs for admission. This dataset offers several advantages in the evaluation of the returns to MBA quality, namely (1) a relatively homogenous group in terms of human capital and career goals, (2) actual, rather than self-reported, GMAT test scores, and (3) a wealth of additional information about individuals both prior to and following their degree, namely college experiences, a detailed work history, pre- and post-MBA earnings, and various self-assessed managerial skills and non-cognitive attributes, such as initiative and self-confidence. Thus, the relatively rich source of data makes a selection-on-observables approach plausible.

Nonetheless, the most important identification attribute of our data is the existence of both pre-degree and post-degree earnings, an anomaly among higher education students.[11] This feature offers a major advantage of studying MBA graduates, as it allows us to estimate individual fixed effects, eliminating time-invariant, individual-specific heterogeneity as reflected in an individual's earnings. Individual fixed effects may be considered an improvement over the selection-on-observables approach, in that observable covariates, however numerous they may be, imperfectly proxy for the actual factors contributing to both educational decisions and education-independent labor market outcomes. Consider, for example, the comparison of person A, who has more innate ability (or ambition, etc.) and interest in attending a highly-rated school, versus person B, who is otherwise observationally identical but has less such aptitude and preferences for program quality. Even controlling for observable characteristics and background, Person A is both more likely to select a higher ranked program and to achieve greater earnings, independent of choosing such a prestigious institution; thus, a simple cross-sectional comparison (or the use of OLS) would lead to upward biased estimates of returns to quality. The fixed effects specification moves beyond this comparison, and instead investigates the "within-individual" variation, not requiring a control group of non-MBAs (or non-highly ranked program graduates) to identify the effect of educational quality on those who obtain an MBA from a highly rated program.[12]

We contribute to the literature on the return to higher education quality in five ways, beyond focusing on the post-baccalaureate MBA degree. First, we use OLS to estimate the return to quality using a large number of individual-level control variables (a selection-on-observables approach), extending the work of Fitzgerald (2000) and Black and Smith (2006).[13] Second, we use factor analysis to create both an index of overall quality proxies and indices of the proxies for the three main inputs: students, faculty, and MBA program characteristics. Here we build on Tracy and Waldfogel's (1997) attempt to distinguish the quality of an MBA program from the quality of its students.[14] This allows us to reduce the effect of error of any particular quality proxy, and provides a convenient way to consider the net effects of different classes of quality variables. Third, we estimate the relative returns to an overall quality index and indices for the three categories of inputs. Fourth, we use techniques to plausibly control for the

[2] For example, Arcidiacono, et al.'s (2008) estimate of a large drop-off in returns to an MBA beyond the nation's top 25 programs is of no help to those considering one of the other over 500 programs. Some studies have concluded that the MBA education is about networking rather than learning (e.g., Mintzberg, 2004) and that earning an MBA did not affect career salaries (Dreher, Dougherty, and Whitley, 1985; Pfeffer, 1977) or career attainment (Pfeffer and Fong, 2002). For a popular press rebuttal, see Yeaple's *Does it pay to get an MBA?* (2006) and *The MBA Advantage* 1994, which include examples of how to use spreadsheets to calculate the net present value of an MBA, including both direct cost and the opportunity cost of foregone earnings.

[3] While *Business Week's* initial ratings of MBA programs in 1988 were based exclusively on the subjective ratings of business school deans, such subjective evaluation continues to constitute forty percent of the current *U.S. News & World Report* MBA ratings system.

[4] Because of differences across years and schools, we used a sample of 17 schools ranked in the top 20 by both magazines in all years. Our correlation calculation is of the change for each school for each two year period in the sample—the same approach as was employed by Dichev (1999).

[5] Some researchers have attempted to account for self-selection concerns by explicitly modeling the student's choice of the type of institution of higher education to attend (Brewer, Eide and Ehrenberg, 1999; Montgomery, 2002, for full- versus part-time MBA programs) or student's choice of field (Paglin and Rufolo, 1990; Arcidiacono, 2004).

[6] Willis and Rosen (1979) rely on exclusion restrictions in a structural model, using income elasticity estimates for selectivity bias to predict the income associated with each field of study for all students.

[7] Twin studies estimate the value of an additional year of education, controlling for family background and common genetic influences (Behrman and Taubman, 1989; Behrman, et al., 1994, 1996; Ashenfelter and Rouse, 1998).

[8] Researchers use a variety of nationally representative longitudinal data sets on labor market outcomes of distinct cohorts of college graduates; examples include the National Longitudinal Survey of the [High School] Class of 1972 (NLS-72) cohort (James et al., 1989; Grogger and Eide, 1995; Arcidiacono, 2004), the High School and Beyond Longitudinal Study of 1980 Sophomores (H&B-So:1980/1992) cohort (Fitzgerald, 2000), or the Baccalaureate and Beyond study (B&B: 93/97) cohort (Thomas and Zhang, 2005). Also see, Black, Sanders and Taylor (2003) who identify wage differences associated with college majors by comparing workers with identical demographic characteristics (namely age, race and ethnicity), without controlling for either selection into college or the choice of a major (based on data from the 1993 National Survey of College Graduates, NSCG).

[9] Other investigators have relied on instrumental variables, for example proximity to colleges or date of birth, to identify the effect of education on earnings (Angrist and Krueger, 1991; Kane and Rouse, 1995).

[10] Arcidiacono et al. (2008) use individual fixed effects for broad classes of MBA programs with the same dataset we analyze here.

[11] Undergraduates typically attend college directly from high school, as do most law and medical students. Although many other graduate student work prior to obtaining such a degree, we are aware of no study that has used such pre-and post-earnings data, other than with our dataset and that of Boudarbat (2008) in which 43% of the Canadian community college students had worked full-time.

[12] That is, the use of fixed effects allows us, in the language of the treatment effects literature, to estimate the average effect of the treatment on the treated. An additional advantage is that it can do so for multiple treatments, whereas other approaches would likely require multiple instrumental variables or exclusion restrictions. Despite the advantages, the fixed effects framework does require certain assumptions for identification, which are laid out and examined in Arcidiacono et al. (2008) and Grove and Hussey (2011).

[13] As mentioned, Black and Smith (2006) use data on undergraduate students and institutions in an attempt to estimate the returns to multiple proxies (individually and collectively) for school quality. In a similar vein, Fitzgerald (2000) uses the following quality measures: selectivity categories, student–faculty ratios, acceptance rates, size of student body, percent graduate students, private vs. public, geographic location, Carnegie Classifications, spending on instruction and on student services, and whether a historically black institution. He concludes that college quality matters more for women than men.

[14] Tracy and Waldfogel (1997) attempt to distinguish the quality of an MBA program from the quality of the students by including multiple characteristics of the student body and of the institution. They find that high faculty salaries and case-method programs led to greater financial value for graduates.