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Abstract

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INTRODUCTION

An axiom among aspiring law school students is that getting into a top law school means receiving not only a top-quality education, but also an opportunity for a top-paying job. And why should they think otherwise? The average starting salary of a Harvard Law graduate in 2006 lie north of $125,000, while starting salaries for Stanford and USC averaged out at $125,000 and $135,000-plus. In some cities, fully loaded compensation for new law graduates in large firms can lie in the range of $180,000 to $200,000 (Bower, 2007). Many professionals in the law community claim that "names open doors," viewing the reputation of the law school one attends as a key to a world of lucrative professional opportunities.

However, getting into a great law school is far from easy and arguably more than just difficult. The fact is that all of the top institutions hold extremely high standards for admission, requiring an applicant to not only have a stellar undergraduate performance, but to score very competitively on the Law School Admissions Test (LSAT). The LSAT is a timed standardized test required for admission to all American Bar Association-(ABA) approved law schools, and many non-ABA-approved law schools. It provides a standard measure of acquired reading and verbal reasoning skills that law schools use to measure an applicant's current abilities as well as to ascertain their potential performance in law school. A common practice for law schools is to use student's LSAT scores and undergraduate grade point averages (UGPAs) in a weighted sum to generate an admission index.

Indeed, a high undergraduate UGPA may indicate a given applicant's ability to win the war, so to speak, but the LSAT tests for the applicant's alacrity on the field of battle. If legal institutions endorse LSAT scores and UGPAs as accurate assessments of ability, to what extent does "ability" influence wages in the legal job market? Do average salaries of graduates of top schools justify these schools' lofty admittance standards? Earning a law degree does not automatically grant its holder the right to practice law; in fact, it is essentially a prerequisite for consideration by the professional organization that regulates the law profession in any given jurisdiction. Upon earning a law degree, aspirants must slay yet another mighty dragon, the bar exam. Given that certain law schools require excellent LSAT scores and GPAs, does graduation from these schools precede high bar

passage rates? Using empirical evidence containing average LSAT scores, UGPAs, starting salaries, and bar passage rates, I will implement Data Envelopment Analysis (DEA) to evaluate relative efficiency levels across 35 law schools in the Pacific West and Mountain zones, including the states of Washington, Oregon, California, Utah, Arizona, Colorado, and Montana.[1]

An interesting preface to an inquiry into law school performance, given the input criteria selected for this study, is the general notion of *predictive validity.* Within the thicket of social sciences, a branch of psychology particularly interested in measuring predictive validity is the field of psychometrics.[2] In the interest of theory and technique, psychometricians attempt to construct instruments and procedures for educational and psychological measurement. The Stanford-Binet IQ test, originally developed by the French psychologist Alfred Binet, represents a well-known outcome of such efforts. Though the IQ test has achieved household name popularity, the test has come under fire or deemed inadequate for several reasons, including environmental discrepancies and individualistic factors. Regardless, the IQ test has remained a widely regarded yardstick of intelligence assessment.

Similarly, there have been concerns that the LSAT may be inaccurate or not fully representative of a given subject's academic potential, particularly with a heterogeneous applicant pool (Fagan, 2002). A prevalent criticism is that the LSAT merely tests someone's ability to take a test under tightly girded time constraints. Yet, despite the negative press, all ABA-approved law schools continue to utilize the LSAT as a key component in their respective admissions processes. Normatively speaking, the touchstone for a given standardized test score must be its ability to consistently predict some important future outcome; the word "standardized" most certainly implies consistency. As well, an ideal university admissions process should be one comprised of a rigorous meritocratic system, selecting only the most auspicious students, with no regard for demographics or socio-economic background. While the LSAT's *accuracy* may be questionable, the bottom line is that most law schools trust the predictive validity

[1] The central Pacific Ocean area, i.e. Hawaii has been omitted for simplification purposes.
[2] "The branch of psychology that deals with the design, administration, and interpretation of quantitative tests for the measurement of psychological variables such as intelligence, aptitude, and personality traits. Also called *psychometry*" (Psychometrics, n.d.)

of the test, viewing LSAT scores as indicative of future academic success and an admitted student's ability to contribute to institutional prestige.

LITERATURE REVIEW

A large amount of literature exists which examines academic performance and academic success prediction. In 1995, John W. Young contributed a report to the "Educational and Psychological Measurement" bimonthly journal entitled, "A Comparison of Two Adjustment Methods for Improving the Prediction of Law School Grades." Young (1995) wrote, "[c]riticisms about the effectiveness of preadmission measures generally focus only on the limitations of the predictors" (p.559). As the title suggests, Young (1995) sought to detect any changes in the predictive validity of the LSAT on law school performance when the criterion was changed from *first-year* grade point average (GPA) to the cumulative GPA (1995). He suggested that many predictive validity studies were inherently limited due their reliance on first year GPA as the criterion. Institutional studies favored first year GPAs because they are easy to obtain and are a well-defined criterion (1995). Further, cumulative GPAs contain "noise" generated by unique grade distributions of the varying combinations of courses taken by students (1995).

Young (1995) viewed the first-year GPA criterion as "neither a sufficient nor [an] adequate measure of a student's overall achievement" and suggested that a cumulative GPA would offer more advantages (1995, p.559). Thus, he proposed using a previously validated grade adjustment method to correct for the interruptive nature of the cumulative GPA. Young (1995) was the first to use his method in a study on post-graduate performance.

Young (1995) obtained data from four accredited U.S. law schools, choosing one school from the West (School A), one from the South (School B), and two from the Northeast (C and D, respectively). Three of the schools were public and one private. Using item response theory (IRT) and the (statistical) general linear model (GLM), Young (1995) generated figures that equated grades from different course (using a rating scale) and displayed optimizing characteristics of the least squares approach.

The results of Young's grade adjustment methods were minor, indicating that the correlation of predictive validity of the LSAT was only slightly improved (1995). Young (1995) attributed the low improvement to the similarity of the law courses taken by the students. In other words, previous efforts using the same adjustment methods yielded greater results because of the greater variation in chosen courses among undergrad students. In law school, everyone essentially takes the same courses. Thus, correlation improvements based on course differences "would likely have little impact in changing the relative rankings of students" (Young, 1995, p.570). School D (from the Northeast) displayed an 83 percent greater correlation between LSAT and future performance than the other three schools. Young (1995) explained this disparity emphasizing that School D had a significantly higher variation of LSAT scores than the other three schools.

Note on Capital

There exists an interesting relationship between Young's research and my forthcoming efficiency analysis. Young's report examines the predictive validity and correlation of standardized testing (LSAT) and UGPA with law school success. In my analysis of law schools, I will utilize the same "predictors" or academic capital measurements as Young; however, the criteria by which the predictors or "inputs" are measured render my project unique. The essence of the project will be in analyzing how law schools handle admitted individuals' qualifications (given the specific criteria), and how an efficient or inefficient cultivation of student talents serves these individuals in the professional job market. Law school graduates fresh onto the legal job scene are presumably endowed with high levels of job search-type as well as industry-specific human capital; the respective school they attend no doubt cultivates the former while signaling the latter (to varying degrees). Both the job search and industry-specific skill sets are likely to render constituents suitable for significant measures of success in the types of professional work environments to which they aspire. For the purposes of this analysis, it is assumed that the graduates of the sample law schools harbor the type of forward-trajectory mindset that not only allows them to thrive professionally, but to discourage questions about sub-par individual performance effects on labor market outcomes. Regarding the law schools, it is unlikely that the results of this analysis will

reveal the extent to which a given school's reputation capital influences a law school graduate's job prospects; however, it is doubtful that a given school's reputation has no bearing on an employment outcome.

RESEARCH METHOD

The relationship between efficiency and production is a crucial aspect of performance in an industry. The survival of an entrant to a given industry often depends on that decision-making unit's (DMU's) ability to achieve a competitive output while operating at an efficient level of production. M.J. Farrell (1957) viewed the relationship between efficiency and production as critical to both economic theory and economic policy, stating, "if economic planning is to concern itself with particular industries, it is important to know how far a given industry can be expected to increase its output by simply increasing its efficiency, without absorbing further resources" (p.11).

For the purpose of taking efficiency measurements, Farrell (1957) introduced the idea of measuring relative technical efficiency by establishing benchmark firms (efficient DMUs in the industry), and then comparing inefficient firms to them. Charnes, Cooper, and Rhodes (1978) expanded Farrell's idea by introducing a linear programming method called data envelopment analysis (DEA).

Advantages of DEA

Since its inception, DEA has become a popular management tool. Among the various approaches to measuring productivity and efficiency, DEA offers some advantages. For example, unlike multiple regression analysis, DEA does not require the estimation of a production function. As well, DEA allows for the evaluation of the efficiency of a number of producers. Statistical approaches rely on a comparison of inefficient producers to some average hypothetical producer. The extreme point technique of DEA, however, compares inefficient firms to actual "best" firms while accounting for differing input combinations or "technologies".

Inherent in the relative measurement approach of DEA is a unique flexibility. DEA provides an adaptable approach to assessing performance in cases where maximizing

profit or revenue is not the main goal. For example, the behavior of public sector DMU's, where empire-building[3] tendencies are likely present (Rosen & Gayer, 2008), might not be conducive to a performance measurement based on profit or revenue. To be sure, the flexibility of DEA is critical to the endeavor of measuring law school efficiency based on starting salary and bar passage criterions.

Data Requirements

An important assumption behind DEA is that if a given firm, say DMU_1, can produce y_a units of output using x_a inputs, then other DMU's using the same combination and intensity of inputs should be capable of the same feat. Likewise, if DMU_2 can produce y_b units of output using x_b inputs, then other DMU's using the same input combination should be capable of similar production. Combinations of DMU_1, DMU_2, *(and any other efficient producers),* form virtual or composite producers to which actual DMUs are compared. If an actual DMU does not fare well compared to its most relevant virtual producer (e.g., uses more inputs to produce the same output as the virtual producer), then the actual producer is *inefficient*.

The software used in this study, "OnFront," authored by Färe & Grosskopf (2000) and published by the EMQ Corporation, identifies benchmark observations and constructs a "best practice frontier" to which other observations are compared (p.2). In this paper, the *outputs* of law schools are the focus, meaning that the best practice frontier will be the output set which is constructed using observations of outputs, given inputs.

Färe & Grosskopf (2000) define the frontier as being constructed using any number of inputs *(x)* and outputs *(y)*:

(N) Different types of inputs (expressed individually): $x_n, n = 1,...,N$

(M) Different types of outputs (expressed individually): $y_m, m = 1,...,M$

[3] William A. Niskanen Jr. suggested that power and status are positively correlated with the size of a bureaucrat's budget and that the bureaucrat's objective is to maximize his or her budget, resulting in oversupply of service.

Accordingly, the analysis of law school efficiency will only require the observation of two different measurable outputs;

y_1 *(first time taker bar passage rate)*

y_2 *(average starting salary).*

Continuing with the notation used by Färe & Grosskopf (2000), the following expression defines the number of DMU's observed;

$$k = 1,..., K.$$

This means that there are *K* different law schools being observed. Observations in the study will include information on all inputs and outputs, conveniently expressed as

$$x^k = (x_{k1},..., x_{kN}) \quad \text{and} \quad y^k = (y_{k1},..., y_{kM}).$$

In summary, the output possibilities set can be expressed as

$$\begin{aligned} &P(x \mid C, S) = \{(y_1,..., y_M): \\ &\sum_{k=1}^{K} z_k y_{km} \geq y_m, m = 1,..., M, \\ &\sum_{k=1}^{K} z_k x_{kn} \leq y_n, n = 1,..., N, \\ &z_k \geq 0, k = 1,..., K\}. \end{aligned}$$

Best Practice Technology

There are three ways to express best practice technology:

- *Input Requirement Set L(y)* that shows all the combinations of inputs that can be used to produce the output vector *y,*
- *Output Requirement Set P(x)* which shows all the combinations of outputs that can be produced by the input vector *x.*

- *Graph GR* which shows the combinations of inputs *x* and outputs *y* that are technically feasible.

(Färe & Grosskopf, 2000, p.3)

As stated previously, the outputs used in this study are first-time taker bar pass rates and first-year average starting salaries of graduates from 35 law schools in Pacific West and Mountain zones of the U.S. The inputs used are UGPA and average LSAT scores of students entering these institutions. Given that this study relies on inputs that function on the consumer preference concept of "non-satiation" (i.e., students should strive to achieve excellent marks), the goal here is not to seek out substitutes or lower degrees of inputs but to increase measured outputs given "high" or in this case, success-driven inputs. To focus on squeezing a high salary and a good shot at passing a state bar exam through substandard undergraduate grades and a mediocre LSAT score would simply be an exercise in futility. However, in the event that this study yields worthy or reliable results, a prospective law student with sub-par undergraduate performance could "shop around" for an institution that scored well and that endorses an admissions requirement feasible for that student.

The bottom line is that output-based efficiency measurements are far more appropriate when dealing with the inputs and outputs used in this study. Table 1, (right) presents an example output set.

Table 1.

School (DMU)	Input x	Output 1 y_1	Output 2 y_2
A	1	2	1
B	1	1	2
C	1	1	1

Using the data in Table 1, the best practice technology may be expressed as

$$
\begin{aligned}
&P(1 \mid C, S) = \{(y_1, y_2):\\
&z_A \cdot 2 + z_B \cdot 1 + z_C \cdot 1 \geq y_1\\
&z_A \cdot 1 + z_B \cdot 2 + z_C \cdot 1 \geq y_2\\
&z_A \cdot 1 + z_B \cdot 1 + z_C \cdot 1 \leq x\\
&z_A, z_B, z_C \geq 0\}
\end{aligned}
$$

The idea is not to decrease inputs, but to expand outputs; therefore, the study of law school efficiency here uses Farrell-type output efficiency measurement.

The *Farrell Output-Oriented Measure of Technical Efficiency* is expressed as follows:

$$F_0(x, y \mid C, S) = \max\{\theta : \theta y \in P(x \mid C, S)\}.$$

Linear Programming

Analyzing the efficiency of K producers is then a set of N linear programming problems. The OnFront software uses the linear programming technique introduced by Charnes et al (1978) to find the best virtual producer. The linear programming problem to be solved in school C in Table 1 is

$$\begin{aligned}
&F_o(x, y \mid C, S) = F_o(1,1,1, \mid C, S) \max \theta \\
&s.t. \\
&z_A \cdot 2 + z_B \cdot 1 + z_C \cdot 1 \geq \theta 1 \\
&z_A \cdot 1 + z_B \cdot 2 + z_C \cdot 1 \geq \theta 1 \\
&z_A \cdot 1 + z_B \cdot 1 + z_C \cdot 1 \leq 1 \\
&z_A, z_B, z_C \geq 0\}
\end{aligned}$$

The maximum value of θ is the producer's efficiency. The z values create the inefficient DMU's distance from the appropriate actual DMU(s) to which it is compared. Solving the above inequalities for optimal values of the z's and θ. by first equating the observed DMU to zero, then substituting appropriate z values, results in the Farrell-type output efficiency level for the particular observation. Any value $\theta > 1$, as in the case with observation C in Figure 1, indicates an inefficient level of output; $\theta = 1$ is efficient, i.e., the school lies on the best practice frontier.

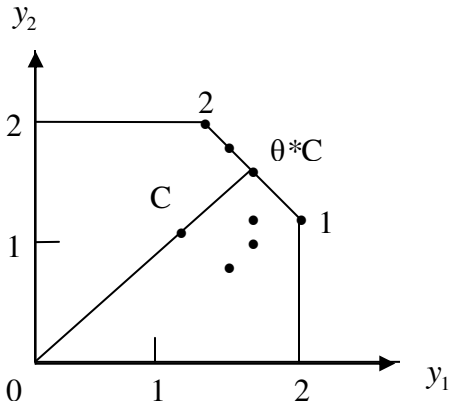


Figure 1

Output Slack

Given the radial symmetry of the best practice frontier, there is a possibility for DMUs to have what is called "output slack" (Färe & Grosskopf, 2000, p.24). What this amounts to is that firms may be technically efficient (DEA score of 1) and lie on the best practice frontier, yet there is room to increase one type of output using the same combination of inputs. A visual representation of this idea is observed in Figure 2. Point 'A' lies on the best practice frontier but should be capable of increasing its output of y_1. As mentioned earlier, DMUs in a sample are all compared to actual best DMUs, represented in Figure 2 by points 1 and 2. In addition to providing Farrell output efficiency scores, the OnFront software may also generate "dual values" and "z-variables." The duals may indicate that a particular DMU contains output slack, while the z-variables represent a given DMU's comparison values, which in turn may be used to calculate said slack.

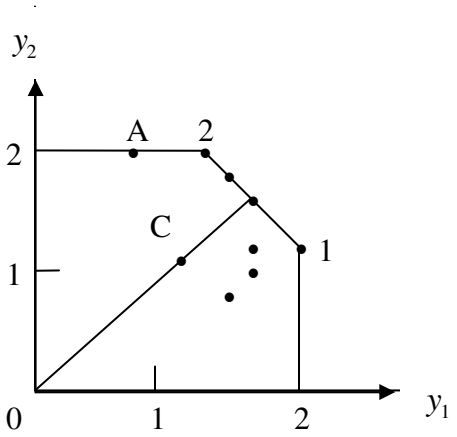


Figure 2

According to Fare and Grosskopf (2000), "[t]here is *Slack* in output y_m for firm *k'* if

$$\sum_{k=1}^{K} z_k y_{km} > y_{k'm} \cdot F_o(x^{k'}, y^{k'} \mid C, S),$$

is true for some solution value for $z_k, k = 1,..., K$" (p.25). In the case of measuring law school efficiency in the manner presented in this study, a law school with some amount of output slack would mean that either its LSAT averages *or* UGPAs could theoretically be decreased while maintaining the established salary and bar passage output.

Virtually every quantitative analysis of data involves some sort of graphical analysis. However, under the circumstances of this study, a two-dimensional graphical representation of DEA results is inappropriate because the data used requires four-dimension.

In summary, the basic features of the data in this study are:

- (x_1) *input 1* – average Law School Admissions Test (LSAT) scores of entering students.
- (x_2) *input 2* – average undergrad grade point averages (UGPA) of entering students.
- (y_1) *output 1* – average starting salaries of law school graduates.
- (y_2) *output 2* – first-time taker state bar exam passage rates of graduates.
- $F_0(x, y \mid C, S) = \max\{\theta : \theta y \in P(x \mid C, S)\}$ Farrell Output-Oriented Measure of Technical Efficiency
- *Sample* – data on 35 U.S. law schools from the Pacific West and Mountain zones used for study.

DATA DESCRIPTION

Data used in this study, including LSAT scores, UGPAs, first-time taker bar passage rates, career placement information, and average starting salaries, is representative of the 2006 academic year and was obtained from "The Princeton Review" web site. The Princeton Review (2007), similar to Kaplan, Inc., has long been associated with student transition into higher education, including graduate, medical, business, and law schools. The Princeton review has divisions in test preparation (SAT, ACT, GMAT, MCAT, LSAT, GRE, USMLE), K-12 programs, and admissions services. Many college admissions offices use Princeton Review resources to introduce their schools to interested students and augment their applicant pool (*Princeton,* 2007). The National Association for College Admission Counseling (NCAC), an organization of more than 9,800 professionals from around the world, endorses The Princeton Review as an ethical and socially responsible service for students in the transition process (*National,* 2007).

As discussed earlier, DEA requires both input and output quantities. Standard microeconomic theory uses labor and capital as production inputs. This study uses LSAT scores and UGPAs of entering law school students as proxies for the standard input measures. Conveniently, no prior calculations were required in preparing input data for use in the OnFront software. The output measures, which include first-time taker bar

passage rates, average starting salaries, and public interest/government sector practice, also required no additional preparation. However, the output measures do betoken a particular technical caveat. The upper-bound nature of the bar passage rates as well as the individual schools' percentages of public interest- and government sector-bound graduates should be addressed. While some graduating classes do actually "achieve" a 100 percent bar passage rate, the majority do not. In 2006 (the data year for this study), 3 out of 181 ABA-approved law schools (1.6 percent) achieved the 100 percent status (*Princeton,* 2007). None of the schools observed in this study accomplished 100 percent passage.

Table 2 shows the descriptive statistics for the input and output data based on the original bar passage and average salary output criterions. An item to note is the higher mean LSAT and UGPA of public versus private schools and the perhaps correlative higher average bar pass rates and first year salaries. Another item to note is the range of values in Table 2. Private schools posses a greater range of LSAT, UGPA, and bar pass values compared to public schools. One possible explanation might be a higher selectivity of private schools than that of public schools, i.e., admissions criteria that weigh some factors, other than LSAT and UGPA values, higher than the average public school admissions criteria. The 2006 acceptance rate for the private schools in this study was 33.6 percent; for public schools, the acceptance rate was 27.7 percent.

If we are to give credence to the widely held belief that private schools are "highly selective" or "tough to get into," the higher acceptance rate coupled with the broader range of acceptable LSAT and UGPA figures of this study, indicates that there must be private institutions that value non-LSAT/UGPA acceptance criteria more than some public schools. Interestingly, a higher selectivity characteristic generally makes a positive statement about an institution, often adding to a given school's highly valued prestige and boosting its reputation capital. Average starting salary ranges between public and private schools remain similar, though public schools have a higher average starting salary than private schools.

Law school graduates entering public interest or government sector areas of law practice do so with the knowledge that these areas are generally much lower paying than private or business sector practices. In fact, many schools offer incentive programs that facilitate "loan forgiveness" in exchange for some degree of commitment to the public

sector. In consideration of these pay disparities, an additional "output" measure representing percentages of law school graduates entering public interest or government law employment is factored into the analysis and a summary of the individual percentages is depicted in Table 3. The intention here is not to change the direction of the study, nor abandon the original research question, but simply to add an interesting dimension to the results, and hopefully augment any possible relationships between LSAT scores, UGPAs, and legal job market prospects.

DEA RESULTS

As previously mentioned, the most appropriate DEA approach for this study is the Farrell-type output efficiency computation. Therefore, the "best practice" DMUs will be those that receive a score of $\theta = 1$. DMUs with scores $\theta > 1$ are said to "inefficient." A simple calculation of $\theta - 1$ will give the percent inefficiency of a given DMU. Table 5 shows the efficiency score data, comparing private school performance to public school

performance using starting salaries and first-time taker bar passage rates as outputs (left column) as well as public interest/government percentages and first year starting salaries as outputs (right column).

First, public schools show a better average efficiency score than private schools. One thing to note is that many California "state" law schools reside in nearby business and commerce hotbeds, where many large private firms flourish, and regularly recruit at these schools. The high salaries of graduates of some of these state schools no doubt improve the overall DEA performance of public schools overall. Another item to note is the efficiency *range* of private schools with salary and bar passage as outputs. Table 5 shows that the public efficiency maximum is 0.78 points below (i.e., better than) the private efficiency score. One possible explanation for this relatively wide efficiency range is the private schools' broad range of acceptable LSAT and UGPA figures. Referring back to Table 2, private schools show an LSAT score range of 151–170, and a UGPA range of 3.12–3.83, compared to the public school LSAT score range of 152–166, and UGPA range of 3.32–3.75. Regarding outputs, private schools show a greater range in both average starting salaries and bar passage rates. The minimum bar passage rate for private schools (35 percent) is 30 percent lower than the public school minimum. Also,

noteworthy is the private school range of bar passage rates. While public schools have a range of 30 percentage points, private schools show a range of 59 percentage points.

In August 2005, the American Bar Association placed two California law schools on a two-year probationary period due to poor bar passage rates. Whittier Law School, located in Costa Mesa and San Francisco-based Golden Gate School of Law (both private institutions) continue to display low bar passage achievements as indicated by the 2006 data observed in this study. Given that these schools have significantly lower LSAT and UGPA requirements, there is some indication that LSAT and UGPA endowment have an influence on subsequent bar passage figures.

Viewing Table 5 again, the mean efficiency scores of public and private schools as computed using public interest/government practice percentages and starting salaries as outputs, are virtually identical. Given the salary/bar output criteria, public schools display a wider range of efficiency scores than do private schools; immediately noticeable is the significantly higher (less efficient) public school maximum. As determined in Table 6 (below), public schools fill a higher percentage of public interest and government sector jobs than do private schools, which places downward pressure on average starting salaries, thus "weakening" the efficiency score of public schools.

Important to note here is that while public interest and government sector percentages do tend to pull down average starting salaries, the share of graduates pursuing these areas comprise a minority. In fact, a sweeping majority of law school graduates seeks out private or business sector positions; other "less favored" fields include academia and judicial clerkships. Whether public schools encourage students interested in public sector work more so than private schools is not immediately evident. In any event, Table 2 shows that the public school mean starting salary is significantly higher than the private school mean.

Table 6. Percent of Graduates Entering Public Interest/Gov. Practice

Mean	
Public	18
Private	15.65
All	16.86
st. dev	
Public	5.72
Private	5.59
All	5.7
Min	
Public	9
Private	5
All	5
Max	
Public	31
Private	25
All	31

Table's 3 provides statistics for "efficient" law schools with Farrell output efficiency scores of 1 to 1.1 and Table 4 depicts "inefficient" schools with efficiency scores of 1.2 and above[4]. Table 3 reveals that efficient private and public LSAT scores, UGPAs, starting salaries, and bar passage rates closely resemble one another with only slight deviations. Given the arbitrary efficient score range, efficient public schools show a lower LSAT score average but slightly higher UGPA figure than private schools, indicating that a equally efficient DEA score was achieved with slightly "less" of the LSAT input, but slightly more of the UGPA input. Concerning outputs, private schools show both a higher mean bar passage rate as well as higher mean starting salaries, which signals once more that LSAT scores perhaps influence bar passage rates. Table 4 shows that "inefficient" public schools have a higher LSAT average and UGPA figure than private schools, though private schools. While private and public average starting salaries are virtually identical, the corresponding bar passage rates are not. Considering that inefficient private schools display lower LSAT, UGPA, *and* bar passage rates than public schools in the inefficient category, the notion that LSAT scores and UGPAs influence bar passage is once again raised.

As previously mentioned, "output slack" can occur when a particular DMU is technically efficient (DEA score of 1) yet there is room to increase one type of output using the same combination of inputs. In this analysis for example, Lewis and Clark Law School shows in its corresponding duals value that it contains slack due to its LSAT (x_1) input figure. In the analysis, Lewis and Clark's comparison schools are Stanford (average LSAT of 170) and University of New Mexico (average LSAT of 155). The corresponding z-variables representing this comparison relationship are 0.33 (Stanford) and 0.6 (New Mexico) which essentially means that Lewis and Clark is being compared to New Mexico *more so* it is being compared to Stanford. The Output slack calculation is as follows:

$$170(.033) + 155(0.6) = 149.1$$

Lewis and Clark's LSAT average is 160, so the output slack is (160-149.1) = 10.9 points. In other words, the average LSAT score for Lewis and Clark could technically be

[4] Truly efficient firms are those with a DEA score value of 1. For the purposes of analysis, an arbitrary range of efficiency and inefficiency has been chosen in order to provide an adequate sample in which to derive additional descriptive statistics.

approximately 149, given Lewis and Clark's average starting salaries and first time taker bar passage rates.

SUMMARY

To revisit the question posed at the beginning; Do high LSAT scores precede high bar passage rates? According to the above results, LSAT scores may affect bar passage rates. Using dual values and z-variables to compute the output slack of relevant DMUs, it was revealed that certain average starting salaries should technically be feasible given a "smaller" input value, or LSAT score. When viewing Table 3, DMUs in a relatively high efficiency range display a correlation between high LSAT scores/ UGPAs and high bar passage achievements. At the upper end of the spectrum, these good scores translate into high starting salaries. However, "inefficient" private schools show a broader LSAT range and lower minimum than public schools but maintain a higher average salary than "inefficient" public schools. Do average starting salaries of top school graduates justify these schools aggressive LSAT and UGPA admissions standards? Perhaps this is a subjective question. This DEA project indicates that LSAT scores influence both starting salary and bar passage rates in the efficiency range of 1 to 1.1, and only affect the bar passage rates in the 1.2 and above range.

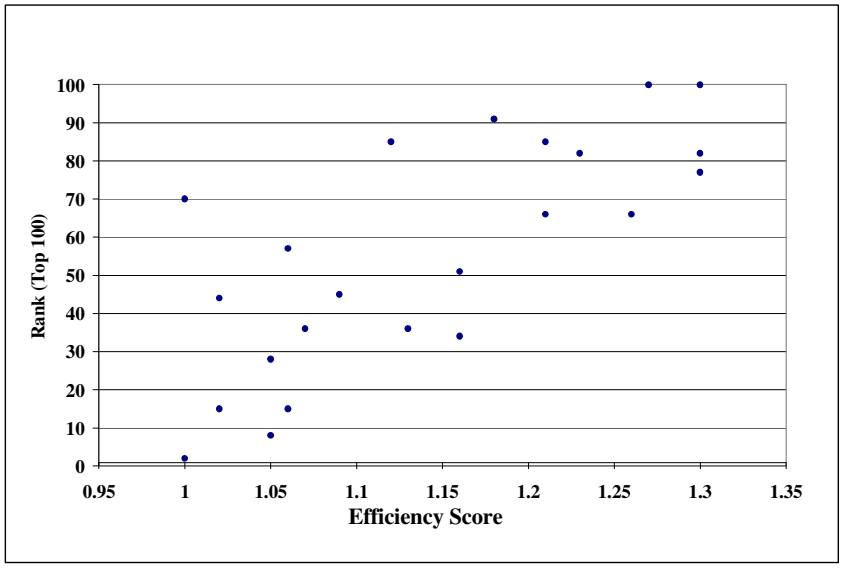
U.S. News Law School Rankings

Law schools generate an admission index using LSAT and UGPA in order to "rank" applications and thus expedite the admission process. It is likely that admitted students experience (to varying degrees) an intensified version of such a meritocratic system within the walls of the institution. However, are law schools ardent proponents of law school ranking systems, such as the *U.S. News and World Report's* "Best Graduate Schools"? On the surface, law schools show an aversion to the rankings or "lists." In 1997, 150 law school deans signed a joint letter denouncing the *U.S. News* rankings; the following year, the Association for American Law Schools commissioned a study calling the validity of the publication's rankings into question. The much-maligned yet widely read list has no doubt stirred up a lot of controversy, yet is influences "decisions that are

central to the academic enterprise – decisions about resources allocation, faculty hiring, curriculum, and so on" (Grossman, 2004, para.48).

Regardless of any dissension they engender, the *U.S. News* rankings do tend to represent some measure of validity, i.e., they serve as an impetus for concrete decisions made by law schools, and they affect decisions of applicants (where to apply, matriculate, or transfer). How do the DEA output efficiency scores obtained in my study compare to *U.S. News* law school rankings? Twenty-three of the thirty-five law schools observed in this study placed in the "Top 100 Law Schools" list. Figure 3, shown below, clearly depicts a significant correlation between the two measures.

Figure 3. U.S. News Rank / DEA Output Efficiency Scores



What, if anything, does the s the relationship between DEA output efficiency scores (using the selected input/output criteria) and the *U.S. News* rankings reveal? There are two important considerations to put forth. First, the DEA study revealed that in the case of "inefficient" privates schools (Table 4), LSAT scores and UGPA less affect the starting salary figure. Second, the *U.S. News* list places significant emphasis (40 percent) on law school *reputation.* Ceteris paribus, there are likely some factors other than the merit of the individual(s) that enables the pool of observed private schools to maintain an average starting salary higher than that of "inefficient" public schools. The correlation between the two scores may reveal (and confirm the intuition) that a school's reputation plays a key role in the placement of a graduate, and to some extent, the graduates starting salary.

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APPENDIX

Table 2. Input and Output Quantities (2006)

	BAR (*y1*)	SALARY (*y2*)	LSAT (*x1*)	UGPA (*x2*)
Mean				
Public	80.89	74971	160	3.5
Private	69.55	69517	158	3.357
All	76.59	72902	159	3.447
st. dev				
Public	8.1	24698.26	4	0.133
Private	17.99	24260.33	5	0.210
All	13.67	24244.84	5	0.177
Min (25th percentile)				
Public	65	41063	152	3.32
Private	35	50000	151	3.12
All	35	41063	151	3.12
Max (75th percentile)				
Public	95	125000	166	3.75
Private	94	135000	170	3.83
All	95	135000	170	3.83

APPENDIX

Table 3. Input and Output Quantities of *Efficient* DMUs: DEA Scores [1, 1.10]

	BAR (*y1*)	SALARY (*y2*)	LSAT (*x1*)	UGPA (*x2*)
Mean				
Public	88	84209	162	3.59
Private	90	89094	164	3.56
All	88	85541	163	3.58
st. dev				
Public	4.34	30077.17	3.65	0.12
Private	5.86	42721.91	6.51	0.31
All	4.55	31677.81	4.27	0.17
Min (25th percentile)				
Public	81	48818	155	3.34
Private	83	50500	157	3.23
All	81	48818	155	3.23
Max (75th percentile)				
Public	95	125000	166	3.75
Private	94	135000	170	3.83
All	95	135000	170	3.83

APPENDIX

Table 4. Input and Output Quantities of *Inefficient* DMUs: DEA Scores [1.25, ∞)

	BAR (*y1*)	SALARY (*y2*)	LSAT (*x1*)	UGPA (*x2*)
Mean				
Public	72	66289	159	3.38
Private	56	66938	156	3.26
All	60	66765	157	3.29
st. dev				
Public	4.99	15391	2.52	0.06
Private	14.81	12058	3.45	0.15
All	14.59	12438	3.36	0.14
Min (25th percentile)				
Public	65	48816	155	3.32
Private	35	50000	151	3.00
All	35	48816	151	3.00
Max (75th percentile)				
Public	76	83000	161	3.44
Private	74	86451	161	3.50
All	76	86451	161	3.50

APPENDIX

Table 5. Farrell-type Output Efficiency Scores (summary)

	Fo(x, y | C,S) SALARY (*y1*)/ BAR (*y2*)	**Fo(x, y | C,S)** PUB./GOV. (*y1*) / SALARY (*y2*)
Mean		
Public	1.1350	1.2505
Private	1.3547	1.2582
All	1.2417	1.2543
st. dev		
Public	0.8979	0.2547
Private	0.3001	0.1509
All	0.2425	0.2076
Min (25th percentile)		
Public	1.0000	1.0000
Private	1.0000	1.0000
All	1.0000	1.0000
Max (75th percentile)		
Public	1.3000	1.9200
Private	2.0800	1.4600
All	2.0800	1.9200