Who Responds to U.S. News & World Report's Law School Rankings?

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Abstract

U.S. News & World Report (USN&WR) publishes annual rankings of ABA approved law schools. The popularity of these rankings raises the question of whether they influence the behavior of law teachers, lawyers and judges, law school applicants, employers, or law school administrators. This study explores some indicia of USN&WR influence. Using data purchased from USN&WR, we attempt to determine whether USN&WR might have influenced 1) law faculty members who respond to the USN&WR survey of law school quality, 2) lawyers who respond to USN&WR surveys, 3) law school applicants choosing a school, 4) employers who hire law school graduates, and 5) administrators who set tuition. We find significant effects on the first three groups, particularly with respect to lower rank schools. That is, there may be "echo effects" of USN&WR rankings that are folded back into subsequent rankings and tend to stabilize them. We also find that rankings may exert some influence on tuition at law schools outside the top 40. We do not find evidence that employers hiring law graduates respond to changes in USN&WR rankings, either in median salaries paid or in employment percentages reported by law schools.

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## INTRODUCTION

Every spring since 1990, U.S. News and World Report (USN&WR) has published a ranking of law schools in the United States. In the early years, the magazine listed the ranks of only their top twenty-five, but in 1994 that list of ranked schools grew to fifty, and in 2003 it was expanded to one hundred.[2] Although there are a number of other law school rankings, including those created by Leiter [2006] and those custom made by visitors to the Ranking Game website [Stake 1998], the USN&WR rankings seem to attract far more attention than all of the others combined. Copies of USN&WR are often seen in the hands of applicants at on-campus law school recruiting fairs, suggesting that rankings may be as important to them as rankings are to parents of applicants to undergraduate institutions, see Machung [1998]. Seeing some of the misleading impressions and counterproductive incentives created by the USN&WR rankings [Stake 2006a, Stake 2006b, Ehrenberg 2000, Whitman 2002], and perhaps concerned about the potentially powerful effects of quantification [Porter 1995], law school administrators have criticized USN&WR for publishing the rankings and have attempted to reduce their impact [LSAC 2005]. Given the pressure to stop publishing the rankings [Bahls 2003], USN&WR's continuation might reasonably be attributed to the revenue from those rankings. What was once the "swimsuit issue" for a news magazine has become the public face of USN&WR

It could be argued that, like the original "swimsuit issue," the USN&WR rankings are merely a form of entertainment, and hence there is not much point in understanding them. That position raises the threshold question of whether there are any actors who make important decisions based on USN&WR rankings. Accordingly, one goal of this study is to look at the impact of the rankings on decisions of students choosing where to attend law school, administrators in determining how much to charge for a law school education, and members of the bar who might be in the position of selecting law graduates to hire. We show that at least some of these actors, especially the applicants, change their behavior in accordance with USN&WR rankings, and, therefore, the rankings cannot be dismissed as mere entertainment. That answer, that some actors do respond, raises the question whether the quality of information incorporated into USN&WR rankings justifies the reliance by those actors, again especially the applicants. Accordingly, we examine the data to see whether the lawyer and academic reputations and other information gathered by USN&WR is itself polluted by its rankings. We find that the USN&WR rankings have what Stake [2006a] called an "echo effect": USN&WR shouts its ranking every spring and then hears echoes of that ranking when it gathers data for the following year's publication.

## WHO IS LISTENING?

The first goal of this paper is to identify some of the actors that appear to take USN&WR rankings into account in making decisions. To do so, we study a number of numbers. What we

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[2] In addition to the specific ranks, in 1992 USN&WR started dividing the remaining law schools into groups of nearly equal size, once erroneously called "quartiles" and now called "tiers." (Generally speaking, quartiles are medians, not groups. The first quartile is the median of the bottom half of the distribution. The second quartile is the median of the distribution. The third quartile is the median of the top half of the distribution.)

call a "factor" is any number that goes into the USN&WR formula for ranking law schools.[3] We attempt to determine whether some of these factors include echoes of earlier rankings. In other words, a factor that echoes is one that is influenced by the USN&WR ranking. If the LSAT median for a law school is a factor that is affected by the ranking of a school, the LSAT is echoic. A factor that does not echo is one that is not influenced by the USN&WR ranking; it is independent. Since bar passage rate is not influenced by the USN&WR ranking,[4] bar passage is independent. Whether a factor echoes or not depends only on whether the actors determining that factor respond in some way to the USN&WR rankings.

Not all of the actors we care about produce numbers that are included by USN&WR in the ranking formula. Numbers that do not appear directly in the USN&WR ranking formula are non-factors. For example, tuition, starting salaries, and male-female ratio are numbers that do not play a direct role in the annual USN&WR rankings. Some of these non-factors, such as tuition, are influenced by the USN&WR rankings. Other non-factors, such as male-female ratio of the student body, [5] are not influenced by USN&WR rankings. By our definition, the non-factors cannot echo, at least not directly. But echoing factors were not our only concern. We want to know whether USN&WR influences a number of decision makers, whether their decisions directly influenced USN&WR rankings or not.

Another goal of this paper is to shed some light on one consideration relating to the degree to which the rankings published by USN&WR are worth the attention of those actors that seem to be responding to them. It is in this connection that we discuss the "echo effect."

## REASONS ECHOES MATTER

As do many summary indicators, USN&WR rankings make it convenient for economic agents to access information about law schools. The largest set of consumers for this product is made up of prospective students, the applicants to law school. They anticipate investing a huge sum of money along with years of effort in a legal education. Essentially none of them have a personal source of product quality for this huge investment. And it is obvious from the fact that USN&WR uses many input factors in its ranking that USN&WR also lacks access to any direct indicator of the quality that its buyers would like to learn; it combines a number of factors in an attempt to reach a summary number that correlates with the quality that applicants need to know.

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[3] The factors in the USN&WR rankings are reputation among law faculty members, reputation among judges and lawyers, median LSAT of entering class, median undergraduate GPA of entering class, acceptance ratio, employment percentage at graduation, employment percentage about nine months after graduation, ratio of bar passage percentage in primary state to bar passage percentage for all test takers in that state, student/faculty ratio, educational expenditures per student, non-educational expenditures per student, and volumes and titles in the library. The data set purchased from USN&WR did not include data for the last three factors. The "ABA Take-Offs" sent to law schools include data similar to those used by USN&WR on those three factors, but those data are confidential.

[4] When we regress bar passage rate on lagged USN&WR score and LSAT lagged four years, the coefficient on lagged overall score is not statistically significant (but the coefficient on LSAT is).

[5] When we regress male-female ratio on USN&WR score lagged one year, the coefficient of the USN&WR score is not statistically significant.

The price paid for this convenience is that the summary numbers might mislead these agents. For example, students following a USN&WR ranking might choose to attend school X when school Y would have been a better choice for them. These mistakes could lead to reductions in their happiness and their productivity as lawyers, and to expenditure of more money on tuition than was necessary. Such mistakes, added up, could also lead to the misdirection of educational assets. Students and money could pour into the schools that are less effective, undermining the feedback system that helps the market allocate resources efficiently. [6]

If the rankings reflect the relative priorities of those who follow them, whatever influence they have should lead in the right direction. But if the rankings deviate from the priorities of the decision makers, they will pull the decision makers away from the correct decisions. Indeed, given that there is a huge number of readers, it seems a certainty that the rankings will fail to reflect the priorities of many.

Rankings can deviate from the priorities of followers by placing either too much or too little weight on a particular factor. A ranking may place high weight on a factor that is useless to the reader, for example scholarship funds when the reader will not qualify for any of that money. Given that rankings are usually based on only a few of the many criteria important to the decision maker, the more likely deviation is that a ranking gives a criterion too little weight, in the extreme case by excluding it entirely. Just to take one example, for a student choosing a school to attend or perhaps an employer choosing a school to hire from, the quality of teaching is a key factor. That critical criterion, however, plays no direct role in the USN&WR rankings, if it plays any part at all.

It is not essential that each important consideration be included as a factor. Some criteria may be represented by proxies. For example, the ratio of teachers to students might serve as a rough proxy for teaching quality. The greater the number of relevant, independent factors a ranking incorporates, the more likely one or a combination of them will correlate with the desired attribute and serve well as a proxy for it. Conversely, the fewer the independent factors, the less likely those factors will capture the information that ought to be included in the summary and the more likely that decisions based on the rankings will be suboptimal. When some factors that go into the ranking formula are largely echoes of the rankings themselves, fewer factors remain to serve as proxies for the desired information.[7]

In the short run, factors that echo from ranking to ranking give the rankings inertia, keeping changes in other criteria from moving the rankings quickly. In the long run, a factor that is a complete echo of its previous self and the previous USN&WR ranking would have no influence on the ranking because it would eventually be pulled in line with whatever the ranking would be if it were based solely on the independent factors. [8] We do not find any factors to be complete

[6] Stake [2006a] has written separately about the troubling incentives the USN&WR rankings create for law schools.

[7] Note that the echo effect does not need to account for 100% of the factor's change in order to have the detrimental effects we discuss here. See the Appendix.

[8] An oscillating system is a theoretical possibility that will not be discussed here because there does not seem to be much oscillation in the USN&WR rankings.

echoes. But we do find factors that are influenced by the previous ranking. To the extent that a factor echoes previous USN&WR rankings, it has no independent effect and offers nothing to enhance the variety and comprehensiveness of the factors on which the rankings are based. When factors echo, they are less effective at representing, whether directly or by proxy, the potentially important variables it would appear that they represent in the ranking. To put it another way, the weight nominally given to an echoing factor in the formula overstates the real impact of information supposedly reflected by that factor. And, on the other hand, the nominal weight given a non-echoing factor is less than the actual ranking impact of the information embedded in that factor. If the weights do not matter, then the degree of echo does not matter. But if the weights are important, the degree of echo in each factor is important.

Some might argue that even if the rankings do not reflect the true priorities of their readers, they will not mislead readers because readers will give them whatever weight they deserve. Mainstream economists are usually comfortable with the assumption that more information is a good thing and people can incorporate or discount that information appropriately.[9] By contrast, lawyers are often comfortable with the assumption that some kinds of information are more dangerous than helpful. This notion is embedded in Federal Rule of Evidence 403, which allows courts to exclude evidence when it is less probative than it is prejudicial or confusing or misleading. USN&WR rankings could fail this legal balancing test if they look more robust than they actually are. One reason rankings might look more robust than they are is that they are based on numbers, rather than mere fuzzy descriptions; numbers take on extra weight simply because they can be combined and manipulated, and they feel objective.

There is another reason rankings may be misleading, a reason that develops over time. Suppose magazine A publishes its ranking, which is based entirely on the placement of each law school as measured nine months after graduation. Those graduates known to have jobs are counted as employed and those not known to have jobs are counted as unemployed. For this purpose, a graduate is counted as employed if she has a job flipping burgers at McDonalds. Would this ranking be given much weight by students choosing a law school? Most of those college graduates searching for a law school would probably not give much weight to the A ranking if they can get a job flipping burgers without a law degree. They might well give it less weight than the school's geographic proximity to family and friends.

To take an extreme case, for illustration, suppose that magazine B decides to publish a ranking that it thinks will be better than A's ranking. B gives 10% weight to placement, defined as in A's ranking, and adds 30% weight for each of three measures of reputation, from applicants, lawyers, and law teachers. This ranking is much more valuable because it relies on three large and different groups of evaluators, and each of those groups will likely take many factors into account. B's ranking is a big success, selling lots of issues, year after year. Eventually, B's ranking becomes so influential that applicants, lawyers, and law teachers all give it great weight in their assessments of law school reputations. In other words, it becomes the commonly accepted source of reputation information and each of those three factors becomes completely

[9] In this regard, as with the "invisible hand," the "dismal science" has a distinctly undismal outlook. There are situations, of course, when more information is counterproductive either because it makes processing it more difficult or because it impedes commitment on the part of the principal in a principal-agent framework.

echoic. Once this happens, the only independent source of information contained in B's ranking is the placement information. In other words, the rankings by A and B are based on exactly the same information, although ranking B will be more stable, changing more gradually over time. B's ranking will look more reliable and, as a result, will sell more magazines and be given more weight than A's ranking. Decision makers might have useful information available to them other than what is embodied in the B ranking, but fail to use it because that information appears less important than the listed factors in the B ranking. For example, many applicants will allow the B ranking to outweigh proximity to family and friends when they would never have given the A ranking that much influence in their decision making. In short, B's ranking, originally much more valuable than A's, has over time become more dangerous than A's ranking. Notice that this result cannot be avoided by changing the weight placed on the four criteria used by magazine B.

This extreme example, beyond anything we found, makes the point that a ranking will look more robust than it is if it appears to substantial weight to lots of independent data while in reality it a portion of the independent data is made up of echoes. The greater the effect of past USN&WR publications, the higher the ratio of dependent to independent information, and the more misleading are appearances. For that reason, a key component in the decision of whether the prejudice of a ranking might outweigh its probativity is the degree to which it is based on echoes of itself.

The misleading of employers and law school applicants is not the only problem created by echoic rankings. They also increase incentives for law schools to lie or to "game" the system by manipulating ranking factors rather than improving the true quality of the school. To take an example at the limit, suppose that magazine C ranks entirely on the basis of a single criterion and that one criterion is directly controlled by the previous year's ranking in magazine C and no other information; in other words, the ranking is based on one, completely-echoic factor. In this situation, the only way for a school to improve its rank is to lie when magazine C gathers data. And if the school lies once, the lie remains valuable forever as it will be reiterated in each successive ranking. By comparison, in a completely anechoic ranking a lie in one year has an effect in only one year.[10] So, if a ranking is more echoic, there is a greater incentive to lie on some factor that goes into it.

To be clear, lying on any factor can influence the ranking of a school in one year and, by definition, lying on one factor will influence all echoic factors in a later year. The more that factors echo, the greater the incentive to lie on any factor. The less echoic the factors used by USN&WR, the less there is an incentive to lie once because the echo dies out sooner.

Of course, the same incentives that might cause one person to lie might cause a different person to game the system in a way that is not as directly dishonest, or perhaps not unethical at all. For example, a school could reduce its class size to increase its LSAT median from 160 to 164. If all else stays the same, the school will move up in the next ranking. Because it is now more attractive to prospective students, the school can restore the class size in the following year, yet retain some of the gains. Those gains will gradually diminish with time as the echo dies out,

[10] Of course, this would not be true if data from one year were used in multiple rankings, as expenditures per student in one year are used by USN&WR in two successive rankings.

muffled under the influence of other factors. But the gains will last longer than they would last if the ranking were wholly anechoic. As with lying, the incentive to game the system is especially strong when temporary manipulations will echo for years into the future.

In some ways, the effect of gaming is no different from the effect of lying; students end up at the wrong school due to misinformation. But there is an additional cost that makes this kind of gaming worse in one way, even though it is considered to be more morally acceptable than lying. Gaming often results in a substantial misallocation of law school resources. Rather than deploying assets to further the proper ends of improving the quality of the legal education, schools will invest in efforts that result in raising their rank. These resources spent on fooling students and others are dead weight losses from society's point of view.

The problem of gaming is not unique to echoic rankings. It is always a problem, whether the criterion being artificially manipulated is partly an echo or not. But the presence of echo effects does change the set of incentives faced by law school decision makers. To take an unrealistically simple example, suppose that the rankings are based equally on two reputational factors, one that ordinarily echoes previous overall rankings and one that is independent of the rankings. And suppose that a school can spend $X to increase either reputation by a certain amount, and that the reputational boost will be permanent but for the influence, if any, of subsequent rankings. In that situation, the school should spend its money to change the independent factor rather than the factor influenced by echoes. The incentive to game the system is especially strong for factors that are not subject to the echo effect because, in the long run, the echoic factors will gravitate toward those independent ones. Suppose, to take a more realistic example, that student/faculty ratio is affected by USN&WR rankings and that bar passage rate is not influenced by USN&WR rankings.[11] If so, law schools might reduce the student/faculty ratio in order to increase bar passage. Since there is no reason to believe that schools in the past erred in their balancing of those two goals, the new incentive is likely to reduce rather than increase the quality of education.

As the number of independent factors increases, it makes more sense for a school to invest in improving education and hope that the improvements will show up in the rankings. As the number of independent factors in a ranking diminishes, the incentives increase to focus efforts on those few factors rather than taking steps that will improve education. Rankings based in part on echoic criteria trigger an arms race on the anechoic factors. In the Appendix we show that an index (score) composed of a linear combination of an echoing factor and a non-echoing factor converges over time to the value of the non-echoing factor.

In short, and if all else is equal, with fewer independent factors, rankings are more misleading and more easily manipulated. That makes it important to know whether the USN&WR criteria echo the previous ranking. Therefore, we attempt to determine the degree of echo in some factors

[11] We find that student/faculty ratio is somewhat echoic; the coefficient on USN&WR score lagged one year is negative and significant.We are not sure why schools would hire more teachers following an increase in rank. Perhaps donations increase, but that would be a fast feedback loop. As for bar passage, as mentioned above, the coefficient on USN&WR score is not significant. Bar passage does vary with changes in median LSAT, and LSAT will be shown below to be echoic, but we do not consider bar passage itself to be echoic because it does not seem to respond directly to changes in USN&WR.

of the USN&WR rankings as well as, more generally, the effect of the rankings on the actions of relevant economic agents. Due to limited data availability, our empirical investigation focuses on the effect of the rankings on the schools' reputations among academics and lawyers, the schools' attractiveness to high LSAT and UGPA applicants, the starting salaries paid by employers to the schools' graduates, and the tuition set by the schools' administrators and trustees. We attempt to answer these questions using a dynamic panel data approach.

## DATA

The data we use for studying these issues were purchased from USN&WR, which publishes many of them, but not all, in the spring of each year. We refer to the data for a year by the year of its publication in USN&WR although the issue published in year $t$ for some years now has had on its cover the year $t+1$. The publication in year $t$ will include the ranks of schools along with various factors that go into the formula. Those data are, obviously, always older than the ranking. For example, the reputation numbers published in year $t$ are based on surveys administered in the fall of year $t-1$. Nevertheless, in our system, those data would be designated reputation$(t)$, the year the reputation was published. For our tests of the influence of rank, we used only schools with precise USN&WR ranks in that year. For that reason, our data include only USN&WR's top 50 (or so) schools for 1994-2002, top 100 for 2003-2010, and top 145 for 2011-2013. The other USN&WR data we used are described in the following paragraphs. With the exception of the reputation surveys, these data are supplied to USN&WR by the schools themselves.

### *Reputation surveys*

In the fall of each year, USN&WR surveys a few faculty members and administrators at each of the law schools, asking them to evaluate every law school by checking one of six boxes, with the choices being "Outstanding", "Strong", "Good", "Adequate", "Marginal", and "Don't Know". Once USN&WR obtains the survey responses, it combines those responses into a single "academic" or "peer" reputation score. USN&WR also surveys lawyers and judges to get their impressions of the reputations of law schools and combines those responses into a single "lawyers/judges" reputation score (which we will shorten to "lawyer"). Our purchased data include both academic and lawyer reputation scores starting with 1998.

### *LSAT*

The USN&WR data include statistics summarizing the Law School Admission Test (LSAT) scores of the students matriculating each year. The statistics published in year $T$ pertain to the class entering school in the fall of year $t-1$. The data include median LSAT for each school from 1994 to 1997 and from 2002 to 2013. The data include the $25^{\text{th}}$ and $75^{\text{th}}$ percentiles from 1997 to 2013. When the median was not available, we interpolated its values from a linear regression of the median on the $25^{\text{th}}$ and $75^{\text{th}}$ percentiles.

### *UGPA*

The USN&WR data include statistics summarizing the undergraduate grade point average (UGPA) numbers of the students matriculating each year. UGPA medians are included from 2002 to 2013. The data include 25th and 75th percentiles from 1997 to 2013. Here we again interpolated the missing values of the median UGPA from a linear regression of the existing median on the 25th and 75th percentiles.

*Starting salary*

The data purchased from USN&WR include statistics regarding starting salaries for graduates entering public and private sector jobs. Those salaries published in year $t$ are collected from the schools in the year $t-1$, and pertain to students who graduated in year $t-2$, which means they apply to students who matriculated in year $t-5$. The data include 25th and 75th percentile starting salaries for private sector jobs for publication years 1997 to 2013. The year dummy variables in all our regressions should take care of variation across years, such as inflation, that affects all schools similarly.

*Tuition*

The USN&WR data include tuition figures from 1994 to 2013. The tuition stated is for students matriculating in the year $t-1$ and is a number that would have probably been decided by administrators before the publication of the ranking in year $t-1$, so the last ranking they would have seen before setting tuition would probably have been the $t-2$ ranking. One variable includes private tuition from 1994 to 2001, and from 2002 to 2013 it includes either private tuition or out-of-state public tuition. Two other variables are in-state or out-of-state tuition for public schools from 1994 to 2013. We created one new variable, by taking the maximum of all three variables.

In Table 1, we present summary statistics of our basic data broken down in two ways: top-40 or not, or public or not.

[Insert Table 1.]

## PREVIOUS RESEARCH

*Influence of rank on law school reputation among, applicants, administrators, academics, lawyers, and employers*

Monks and Ehrenberg [1999] studied whether USN&WR rank influenced decisions of applicants as to where to apply and whether to enroll, and decisions of the school regarding percentage of applicants to accept and the tuition to charge. They studied thirty undergraduate institutions highly ranked by USN&WR over eleven years. Their analysis indicated that worsening rank led to lower matriculation rates by students and higher acceptance rates by schools. Their research supported the anecdote by Hansmann [1999] to the effect that Yale Law School's number-one rank led to an increase in yield the following year. Monks and Ehrenberg also found that an increase in endowment per student also improved yield, probably by allowing schools to offer better financial packages. Better yield, in turn, resulted in better average SAT scores. They did not find tuition to vary with rank, but found grants and aid to increase with lower rank. We test some of these conclusions with a data set drawn from a smaller population, law schools rather than undergraduate institutions, but which represents a much larger portion of that population, more than half of the schools by the end of the period studied. We do not have data on financial assistance and endowments, and therefore could not examine their findings that the schools of lesser rank offer greater financial assistance and that greater endowment leads to improved yield.

Sauder and Lancaster [2006] found that USN&WR has a significant effect on decisions of both applicants to law school and the schools themselves. Using data for all law schools for the period from 1993 to 2003, they ran pooled cross-section fixed-effects Prais-Winsten regressions. To test for applicant behavior, they regressed the number of applications, percentage of applications with high, medium, and low LSATs, and percentage matriculation rate on USN&WR rank, with school size and year as controls. They found a number of significant effects on students. Within the top 50 schools, an increase of one step in rank leads to an increase of 19 applications and a .18% increase in the percentage of accepted students who matriculate. Relatedly, Sauder and Lancaster found that schools in the top two tiers have a higher percentage of applicants with LSATs above 160 and a lower percentage with LSATs below 150 than schools in the bottom two tiers. Sauder and Lancaster [2006 at 128] interpreted their findings "to mean that applicants use the *USN* tiers to match themselves to schools based on their own LSAT scores." There is, however, another explanation of their findings. It is possible that the students looked instead at the acceptance data that was available to them, data which probably correlates with the USN&WR ranks. For years, many law schools made available tables that would tell the percentage of students accepted for a given range of LSAT and UGPA numbers. Those matrices would have been more directly useful to students trying to determine where to apply than would be any proxy for that data such as rank in USN&WR.[12]

Regarding the effects of rankings on the behavior of law schools, Sauder and Lancaster [2006] found no significant effect of rank on tuition. However, they did find that within the top 50 schools, an increase of one step in rank leads to a significant .2% reduction in the percentage of students accepted. Sauder and Lancaster concluded that "ranks affect . . . the percentage of applicants who are accepted . . ." and "we have demonstrated that USN rankings provide a signal of law school quality that influences the behavior of . . . law schools."[13]

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[12] Similar information is available today from LawSchoolNumbers.com. That website publishes for each school a grid of LSAT and UGPA with dots that indicate whether an applicant was admitted or not. Although the data are reported by applicants and cannot be confirmed, the grids appear to give some indication of whether a student will be admitted or not.

[13] There is, however, another explanation of their results, which goes as follows. To start, schools may set admissions goals based on previous goals and the previous year's applicant pool and any recent changes in the number of LSAT test takers, often raising the LSAT and UGPA goals at least somewhat if the applicant pool has grown. (This may be the "ratchet principle" that has been often observed in bureaucracies. See, for example, Weitzman (1980) and Freixas, et al (1985).) For the initial acceptances, the schools accept or deny students based on those new goals. At a number of points during the spring and summer, as students confirm that they will attend, the schools compare their number of confirmed students to the number at the same time the previous year and adjust the number of students they will accept during the following days or weeks. Because the applicant behavior depends in part on USN&WR rank, the result depends on rank, but in this scenario, the schools make no use of their rank in

Schmalbeck [1998] found that law school reputations among academics were stable, and did not vary with rank in USN&WR. However, his study was hampered by limited data. The present study is designed to re-examine that question with a much larger data set.

Coincidentally with Sauder and Lancaster, Stake [2006a] also found that the LSAT and UGPA statistics of law schools varied with changes in USN&WR rank. Assuming that law schools tend to accept students with numbers above their medians, he reasoned that most of the change in a school's 75th percentile LSAT and much of the change in 75th percentile UGPA is due to changes in the behavior of applicants rather than changes in the behavior of schools. He concluded that rank influences applicants in their choice of law school. Regarding reputations among lawyers and academics, Stake found that changes in USN&WR rank do influence the reputation scores that USN&WR receives in its surveys of academics and lawyers and judges. Because USN&WR rankings affect LSAT, UGPA, lawyer reputation, and academic reputation, and those are variables in the formula used for USN&WR rankings, one would expect a change in rank to echo into subsequent years. To the degree that USN&WR rankings are echoes of themselves, they fail to provide useful information to consumers. The current study is designed to test for the echo effect with a more sophisticated econometric technique than was employed by Stake in 2006 and with more data than were available at that time. This study is also designed to test whether USN&WR affects tuition decisions made by administrators, apart from the opinions they expressed on survey forms.

*Influence of school rank on earnings of graduates*

There is a vast literature on the returns to education in various settings. Not so many papers, however, address the returns to school quality, and those that do present mixed results. In a 2002 article, Stacy Dale and Alan Krueger found that attending a more selective college did not result in higher income later in life for most groups of students. They studied students who were accepted by both the University of Pennsylvania and the Pennsylvania State University to see whether those who matriculated at the more selective former school earned more after graduation. After controlling for unobserved student ability in this way, they concluded that for most students, the more selective college education did not produce higher pay. However, for students coming from a lower income background there was a positive payoff to the more selective college. Dale and Krueger followed up in 2011 with another attempt to control for unobserved student ability, this time by including the average SAT of the schools to which the students applied and the number of schools to which they applied. Again they found that their controls for unobserved ability wiped out the effect of college selectivity on subsequent earnings for most groups of students.[14]

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setting admission standards. In other words, application rates and applicant matriculation rates are negatively correlated with acceptance rate, and the applicant behaviors are the driving force in the process. None of this should be read to deny that USN&WR has influenced law school behavior or, in particular, the law school admissions process. Although schools have conformed far too readily to USN&WR priorities [Stake 2006a, 2006b], they need not have used a previous year' ranking in their admissions process in order to generate the results found by Sauder and Lancaster.

[14] Dale and Krueger [2011] warn [at 8] that their estimate of the effect of selectivity in their model would be biased downward if students with high unobserved earnings potential (that is, outside of SAT and GPA?) are less likely to attend the more selective schools of the ones that admitted them.

Our study is cruder than Dale and Krueger, as it looks only at the median starting private sector salaries by school and uses the school's median LSAT as a proxy for student ability. To be specific, we do not control for unobserved student quality in any of the ways that Dale and Krueger did. Nevertheless, we might shed some light on whether there is a payoff to attending a higher rank law school. One complicating fact is that starting salaries are low for some of the most prestigious jobs, such as clerking for a judge. Another complication arises from the possible tradeoff between salary and attractiveness of the job. Graduates in a position to choose may forego some income for greater job and family satisfaction. Stake et al. [2007] found some evidence of such a tradeoff among graduates of Indiana University School of Law-Bloomington. We do not control for these potentially confounding factors. However, the tradeoff is present for graduates of any law school, so perhaps salaries would be expected to increase with rank even in the presence of this tradeoff.

In a study published before USN&WR law rankings became annual, Ehrenberg [1989] used data from a single year to regress average starting salaries by law school on median LSAT, rank based on "Gourman score", gender and minority percentages, and a dummy variable for public schools. He found that salaries increased with LSAT and rank, and were significantly lower for graduates of public schools. He did not find any significant effect of race or gender composition. We attempt to address some of the problems of Ehrenberg's econometric approach, such as the likely endogeneities in the data and the possible omitted variable bias likely to be a serious problem in cross-section regressions. For example, LSAT scores of students attending a given school might be strongly influenced by the salaries of its graduates. Also, schools might have a host of characteristics not included in Ehrenberg's regressions that may be correlated with both salary and rank, or rank and median LSAT score, etc. These types of problems seriously undermine confidence in Ehrenberg's results. Our panel-data approach, described in the following section, reduces or eliminates these problems.

Our study is designed to shed some additional light on whether school rank influences starting salaries, controlling for LSAT. In particular, this study is designed to test whether USN&WR affects hiring decisions made by employers and not just the opinions expressed in surveys of employers. The focus on the hiring decisions as reflected in starting salaries received by the law school graduates is particularly important because salaries represent an employment market response to the USN&WR rankings. The studies mentioned above and quotes from students [Bahls 2003] demonstrate that the rankings influence the behavior of law school applicants. If, however, rankings do not affect the employment opportunities of the graduates, as one employer quoted in Bahls [2003] suggested is possible, the rationale for the applicants' behavior would be significantly undermined. On the other hand, if the rankings have an impact on employment opportunities, applicants are more justified in paying attention to the rankings.

## METHOD

Our overall goal in this paper is to determine the effect of appropriately lagged USN&WR scores and ranks on the behavior of various groups of actors connected to law schools. Our goal is quite challenging, due mainly to the nature of the data. In addition to the questionable reliability of data reported by law schools, four main factors make it difficult to achieve our goal. First, schools have a number of unobservable or hard-to-measure characteristics, such as quality of teaching and academic atmosphere. Second, the errors associated with observations on the same law school for different years are likely to be serially correlated and even the disturbances for each school for a given year may not be independent. Third, it is often hard to control for various factors, such as student quality, because most of the important variables are highly correlated with USN&WR ranks. Fourth, most of our variables are strongly autocorrelated. All of these problems are serious, and without an appropriate econometric approach they can result in seemingly highly statistically significant estimates simply due to the persistent and correlated nature of the time series involved rather than because of any causal relationship within the data.

In order to deal with these problems we employ as our benchmark estimation approach the Arellano-Bond System GMM as implemented in the STATA command xtabond2. This procedure is designed specifically for the type of data we have. In particular, it is well-suited for panel analysis of a dynamic process where current realizations of the dependent variable are influenced by its past values, where some or all of the regressors may be endogenous, and the idiosyncratic disturbances may have group-specific (i.e., law school-specific in our case) patterns of heteroscedasticity and serial correlation. The procedure does assume, however, that the disturbances are uncorrelated across groups of observations for a given year.[15] To make the latter assumption more likely to hold, we include year dummies in our regressions.

For purposes of comparison, we also present the results of conventional fixed effects OLS regressions even though we view them as considerably more problematic than System GMM estimators.[16] Note that Arellano-Bond estimators are very data intensive and, therefore, their reliability declines quickly as the number of groups (i.e., schools in our case) diminishes. This fact should be kept in mind when evaluating our results. In addition, wherever appropriate, we present fixed effects estimates that avoid the biases related to the lagged dependent variable, but at the expense of imposing more structure on the relationship among our variables. Specifically, we regress the change in our dependent variable on the previous year's difference between the school's rank on that dependent variable and the school's rank overall in USN&WR. The intuition behind this regression is that some components of the USN&WR index for a given school react adaptively to the previous year difference between the rank of the component and the rank overall, to bring the component's rank into closer alignment with the overall rank. So, if the component was ranked lower than the overall index last year, it has a tendency to catch up in the current year.

To sum up, we estimate two types of regressions:

$$Y_{i,t} = b_1 + b_2 \times Y_{i,t-1} + b_3 \times USN_{i,t-1} + b_4 \times X_{t-1} + b \times t + i + \varepsilon \qquad (*)$$

and

[15] See Roodman (2006) for a highly accessible discussion of this estimating procedure. Bond (2002) presents a somewhat more involved analysis of dynamic panel data estimators.

[16] In particular, conventional fixed effects estimators are biased and inconsistent in the presence of lagged dependent variable.

$$\Delta Y_{i,t} = c_1 + c_2 \times (Y\_RANK_{i,t-1} - USN\_RANK_{i,t-1}) + c_3 \times X_{i,t-1} + c \times t + i + v \quad (**)$$

where $Y_{i,t}$ is the value of our dependent variable such as academic reputation or average LSAT score of the matriculants in school $i$ in year $t$, $\Delta Y_{i,t} = (Y_{i,t} - Y_{i,t-1})$, $USN$ denotes the value of the overall index, suffix $RANK$ indicates the rank of the corresponding variable, and $X$ stands for some additional control variables. The details of the specific equations will be shown in the sections below. We do not estimate regressions (**) for starting salary and tuition because it is unlikely that these variables are thought of in terms of "ranks". Note that regression (**) essentially assumes that in regression (*), $b_2 = 1 - b_3 = 1 + c_2$. Unfortunately, testing this hypothesis is far from straightforward, because in System GMM specifications we often need to use more than one lag of the dependent variable and fixed effects OLS regression estimates are biased. Moreover, presumably due to the discrete nature of ranks, regressions (*) work better when we use scores rather than ranks as the dependent variable.

We ran most of the regressions both for the entire sample and separately for the top 40 schools (more precisely, the 52 schools that were ranked by USN&WR in the top 40 in at least one of the years covered by our data) and all other schools. As we mentioned earlier, the pre-2002 period contains only the top 50 schools. Therefore, it is possible that the results for different groups of schools also reflect the effect of the time period. We included the lagged dependent variable to account for the lagged time-dependent unobserved factors influencing the dependent variable. For example, in the case of academic reputations, there might be inertia, aside from that based on lagged USN&WR rank, because many of the academics surveyed remain the same from year to year.[17]

Issues relating to the specific regressions are discussed below, along with the results.

## RESULTS

### *Reputations of law schools among academics and lawyers*

To determine whether USN&WR influences academic or lawyer opinions, we regress reputation score on its lagged value and the lagged USN&WR overall score or overall rank of the schools. (We do not use both in the same regression because they are so highly correlated.) Our goal here is to determine whether the USN&WR publication early in year $t-1$ influences USN&WR survey responses later in year $t-1$, the echoes heard by USN&WR, which are reported in year $t$. So, our null hypothesis is that USN&WR score or rank in year $t-1$ is not a significant factor in the regression of reputation scores on independent variables.

To start, for academic reputation, we estimate the following regression:

$$AC\_REP_{i,t} = b_1 + b_2 \times AC\_REP_{i,t-1} + b_3 \times USN\_SCORE_{i,t-1} + b \times YEAR + i + \varepsilon \quad (1)$$

[17] Sometimes we used values of the dependent variable lagged two years in order to "soak up" serial correlation and achieve acceptable values for the AR(2) tests.

where $AC\_REP_{i,t}$ denotes reputation score of school $i$ among academics in year $t$, $USN\_SCORE_{i,t-1}$ stands for the USN&WR score of school $i$ in year $t-1$, $YEAR$ represents a vector of time dummies, and $i$ is the school index (fixed effect). The estimates are presented in Table 2A.

[Insert Table 2A.]

The coefficient of USN&WR score has the expected sign and is significant at 1% level in the fixed effects OLS regressions, offering some evidence that academics modify their views of the schools in the direction of the overall USN&WR scores, although OLS results are not reliable because of the bias introduced by lagged dependent variable and because of the serial correlation in the errors. The System GMM regressions avoid both problems, and from them we see that the effect of USN&WR score on academic reputation is significant at the 1% level when all schools are included, giving us confidence that academics are indeed influenced by the USN&WR. However, closer examination of the System GMM results reveals that most of the evidence for an echo effect is found in the sub-sample of lower rank schools. The regression for the top schools (those 52 schools that have been ranked in the top 40 in at least one year between 1998 and 2013) does not produce a statistically significant relationship between academic reputation and previous USN&WR score. Note, however, that System GMM results are not reliable when the number of schools is relatively low. The relationship is significant at the 5% level for the 96 schools that have never been ranked in the top 40.

[Insert Table 2B.]

As shown in Table 2B, when we regress academic reputation score on previous USN&WR *rank* (as opposed to score) we find a similar, but notably weaker, relationship. (The coefficient on rank is negative because a better school has a lower rank number.) The fixed effects OLS regression again shows results significant at the 1% level for all schools and for both rank-based subgroups. The System GMM regression shows a relationship that is significant at 5% for all schools and 10% for the subgroup of 96 schools never ranked in the top 40. As above, the System GMM regression finds no significant connection for the schools that have been ranked at some point in the top 40. The difference between Tables 2A and 2B suggests that academics are influenced more by previous year score than by previous year rank.

Since 1998, both score and rank seem to have had more influence on academic reputation for schools of lower rank. Given that academics probably know more about academics at higher rank schools, in part because they are more likely to come from higher rank schools and in part because the ranks of higher rank schools were watched carefully before 1998, it is not surprising that after 1998 academics would have more confidence in their priors for the top schools and would be less influenced by USN&WR in their views of those schools.

We considered the possibility that readers of USN&WR were not paying attention to the rank or score but rather to the LSAT of the students who attend. The student statistics are the thickest market data in the USN&WR ranking, incorporating decisions made by tens of thousands of persons with tens of thousands of dollars on the line. Since USN&WR publishes the LSAT statistics on the same page as the rank and score, responses to USN&WR might be responses to changes in LSAT instead of changes in rank. To check this, we ran additional estimations with

LSAT as an independent variable, which are presented in Table 2C. When LSAT is included together with USN&WR score, USN&WR score is significant at the 5% level and LSAT is not statistically significant. When LSAT is included along with rank, neither LSAT nor USN&WR rank is significant. When LSAT or USN&WR rank is used alone, they are significant at the 5% level. As mentioned earlier, when only USN&WR score is included, it is significant at the 1% level. Given these results, it does not appear that academics are paying attention to LSAT instead of USN&WR rank or score.

[Insert Table 2C.]

It is important to note that the dynamic nature of the problem implies that the effects of a change in an exogenous variable in a given year accumulate over time. Consider the dynamic relationship described by $y_t = \alpha y_{t-1} + \beta x_{t-1}$ and let $x_0$ experience a shock equal to $\Delta x$. Then, assuming nothing else changes, the change in $y_1$ is going to be $\Delta y_1 = \beta \Delta x$. The following year, $\Delta y_2 = \alpha\beta\Delta x$. In year 3, $\Delta y_3 = \alpha^2\beta\Delta x$, and so on. As a result, the effect of $\Delta x$ on $y_k$ would equal $\beta\Delta x \sum_{i=1}^{k} \alpha^{i-1} = \beta\Delta x(1-\alpha^{k-1})/(1-\alpha)$. To illustrate, consider the System GMM estimation results for the full sample in Table 2A. They imply that in order to change the academic score by a full 0.1 (the minimum increment presented by USN&WR) in the following year, the USN&WR score would need to change by about 17 points or about one standard deviation. However, in order to effect the same change over the following five years, the USN&WR score would need to change only by $6 \approx 0.1 \times (1-0.637)/(0.007 \times (1-0.637^4))$, or close to one third of one standard deviation. While 0.1 represents only about one eighth of standard deviation of academic reputation score, it could mean a substantial change in overall rank. In particular, a change from 2.3 to 2.4 in academic score could, according to modeling by one of us, result in a change of five in overall USN&WR rank. Put differently, one standard deviation change in USN&WR score in year $t$ would result in about one third standard deviation change in academic reputation score in year $t+5$.

Regression of the type (**), i.e.,

$$\Delta AC\_REP_{i,t} = c_1 + c_2 \times (AC\_RANK_{i,t-1} - USN\_RANK_{i,t-1}) + c_3 \times \Delta LSAT_{i,t-1} + c \times t + i + \varepsilon \quad (1A)$$

yields highly statistically significant coefficients for all schools as well as for the two subgroups, and these coefficients are not very much affected by the addition of LSAT scores. Moreover, LSAT scores coefficients are not even statistically significant in the presence of the difference between ranks (see Table 2D).

[Insert Table 2D]

A similar exercise reveals that USN&WR probably influences the reputation of schools among lawyers and judges.

[Insert Table 3A.]
[Insert Table 3B.]

In both of the System GMM regressions of lawyer reputation on rank and score, the relationship is significant at the 1% level when all schools are considered, and significant at 1% for the subgroup of schools below the top 40, while there is no statistically significant effect on schools in the top-40 subgroup. Judging by the System GMM results, lawyers and judges, like academics, seem to be influenced by USN&WR more for the lower rank schools than for the schools of higher rank. Comparing Table 3A to Table 3B, we see that the System GMM point estimate of the relevant coefficient for the full sample is nine times larger in absolute value for the regression on score than for the regression on rank and the mean of the score is about 20% larger. Evaluated at the mean, the elasticity of lawyer reputation with respect to the USN&WR score is about 0.28 while its elasticity with respect to USN&WR rank is approximately one tenth of that value. This difference can be explained by the fact that estimates based on rank are simply less reliable, because rank essentially reflects the score with a measurement error and thus the estimate of its impact suffers from the attenuation bias. This argument is consistent with the view that lawyers pay more attention to the overall USN&WR score than rank. The significance levels of OLS results are different from System GMM results, but the two sets of results are not contradictory and, as mentioned before, we view System GMM results as more reliable.

When we regress lawyer reputation on LSAT alone, the LSAT coefficient is significant at the 1% level, as seen in Table 3C. However, when we include either USN&WR score or rank along with LSAT as independent variables, the coefficient on LSAT loses significance, while the coefficient on USN&WR score remains significant at the 1% level and USN&WR rank is significant at the 10% level.

[Insert Table 3C.]

As in the case of academic reputation, regressions (**) have highly statistically significant coefficients that are unaffected by the addition of LSAT scores to the right hand side of the equation (Table 3D).

[Insert Table 3D]

Comparing Table 2A (or 2B) to Table 3A (or 3B), the effect of overall score (or rank) on reputation among academics and among lawyers, the System GMM point estimates for lawyer score are almost twice as large as they are for the academic score in the regressions based on the entire sample. Although the OLS regression does not produce this result, as stated earlier, we believe that System GMM estimates are more reliable for our data and, therefore, the results suggest that lawyers are more influenced by school USN&WR scores than are the academics. While the effect of USN&WR rank on lawyer reputation appears to be twice as large as the effect on academic reputation, the echo effect will likely be of similar strength because academic reputation is worth 60% more than lawyer reputation in the USN&WR formula. If that is correct, considering both echoes, a change of four in USN&WR score could echo forward into a change of two in rank.

*LSAT*

To determine whether law school applicants are heeding USN&WR, we regress median LSAT on USN&WR score and rank. Unlike the direct indication of reputation derived from surveys of academics and lawyers, a school's reputation among applicants is indicated only indirectly by the median LSAT of the students matriculating at the school. Of course, the median LSAT is a function of decisions by the applicants and the schools admitting those applicants. Our assumption is that the lion's share of any change in the LSAT statistics of a school's students during our time period is due to applicant behavior rather than law school decisions. Schools have been working hard to maximize their USN&WR rank for more than a decade. At least since Klein and Hamilton [1998] published their study finding that most of the variance in the USN&WR rank could be explained by the LSAT, with most of the rest explained by reputation score, schools have known that the LSAT plays a large role in the USN&WR formula (nominally 12.5% of the total). Because schools have been trying to maximize this number for some time, they have been careful not to reject many applicants with LSAT's above their medians who might plausibly matriculate. For that reason it seems reasonable to assume that an increase in a school's median or 75$^{th}$ percentile LSAT occurs largely because the school is more attractive to students with high LSAT's.[18] Therefore, a school's median LSAT can be seen as a measure of the school's reputation among applicants as of the time that they vote with their feet and a fistful of dollars.[19]

We estimated the following regression equation (here and in the other equations below we are not showing time and school fixed effects to shorten the equations):

$$LSAT_{i,t} = b_1 + b_2 \times LSAT_{i,t-1} + b_3 \times USN\_SCORE_{i,t-1} + \varepsilon, \qquad (2)$$

where $LSAT_{i,t}$ denotes the median of the LSAT scores of students at school $i$ matriculating in year $t$.

[Insert Table 4A1.]

As the results in Table 4A1 show, in both the fixed effect OLS regression and the System GMM regression, the lagged USN&WR rank has a coefficient that is statistically significant at the 1% level for all schools and for the lower subgroup of schools, indicating that a school's USN&WR score does echo back to USN&WR in the matriculation behavior of law school applicants. The effect of changes in rank of schools in the top 40 on the matriculation behavior of applicants is not quite as strong, with a coefficient significant at the 5% level in the System GMM regression. That effect follows the pattern seen with the reputation surveys, with apparently greater influence

18 Changes in admission and scholarship policies at a school also produce some effect, so we cannot expect the LSAT statistics to vary solely with the attractiveness of the school, much less with USN&WR rank.

19 Some authors have recommended that a good way to rank schools would be to look at individual choices and match them up in a tournament of law schools. Loosely speaking, the second or third quartile LSAT already reveals that information. Each school that attracts a student with an LSAT of, say, 160, has probably beaten out every school that has a third quartile LSAT below 160, because every school with a third quartile below 160 would probably have accepted that student. However, it should be noted that although the winning school beat each school below it, the criteria used by the student should not be assumed to be limited to the quality of the school. The price of tuition would also matter, obviously, as would other considerations not related to the quality of education, such as personal considerations like proximity to family and so forth. But those same caveats apply in the context of determining winners under the head-to-head tournament approach.

for schools always ranked outside the top 40. Moreover, this effect can be substantial numerically. One standard deviation change in USN&WR score (i.e., a change of 17) would result in one point or one sixth standard deviation change in median LSAT in the following year. Over five years, the impact would be close to 2.5 points or almost one half of standard deviation of median LSAT.

A school's rank, however, may not be the only factor in the high-LSAT admitted students' decisions to matriculate. Tuition, including scholarship and state-resident discounts, location, and salary may exert some pull as well, though not as much as rank (see Broughman and Stake in progress). Since starting salary correlates with rank, it is possible that the real driver of student behavior is expected salary. In order to account for the potential influence of starting salary on median LSAT, we added the logarithm of the previous year's salary as an independent variable to the median LSAT regression.

That is, we estimated the following regression equation:

$$LSAT_{i,t} = b_1 + b_2 \times LSAT_{i,t-1} + b_3 \times USN\_SCORE_{i,t-1} + b_4 \times SALARY_{i,t-1} + \varepsilon, \quad (3)$$

where $SALARY_{i,t-1}$ is the logarithm of the median starting salary of the students graduating in year $t-1$.

[Insert Table 4A2.]

Adding this independent lagged salary variable to the System GMM regressions reduced statistical significance of the estimate for the entire sample and for the lower rank schools to 10% while increasing significance of the estimate for the top schools. The most important outcome, however, is that the coefficients of the salary variable are not statistically significant at the 10% level in any of the System GMM regressions on USN&WR score, although salary is significant at the 15% level for the group of all schools.

We estimated similar regressions to see whether USN&WR rank had more influence than USN&WR score. Specifically, we estimated the following regression equations:

$$LSAT_{i,t} = b_1 + b_2 \times LSAT_{i,t-1} + b_3 \times USN\_RANK_{i,t-1} + \varepsilon, \quad (4)$$
$$LSAT_{i,t} = b_1 + b_2 \times LSAT_{i,t-1} + b_3 \times USN\_RANK_{i,t-1} + b_4 \times SALARY_{i,t-1} + \varepsilon, \quad (5)$$

[Insert Table 4A3.]
[Insert Table 4A4.]

As the Tables 4A3 and 4A4 show, in the fixed effect OLS regressions, the lagged USN&WR rank has a coefficient that is statistically significant at the 1% level for all three groups of schools. In the System GMM regressions without salary, the coefficient on USN&WR rank is significant at the 5% level for all schools and at 1% level for the schools never ranked in the top 40, while the effect for top-40 schools is significant at the 10% level. In the regressions with salary included the rank coefficient is statistically significant at the 1% level for all schools and for the lower rank subsample, and significant at the 5% level for the top-40 subsample. The coefficient on salary is significant in the System GMM regression for the lower rank subsample, but the coefficient on USN&WR rank is more significant. Once again, the numbers indicate that USN&WR rank or score echoes back to USN&WR through the matriculation behavior of law school applicants.

The effect on the median of matriculants' LSAT scores is quantitatively substantial. According to the point estimates from System GMM regressions, one standard deviation increase in USN&WR score results in about 0.3 standard deviation rise in median LSAT. Over five years the impact of that one-year change would increase median LSAT by more than more 2.5 points or more than one-half a standard deviation. The effect of USN&WR rank is not as strong. The point estimates of the rank coefficients for the subsamples of schools (-0.024) suggest that a 10 point increase in the rank would result in 0.24 increase in median LSAT the following year and the five-year effect would be an increase of about one-half a point.

Somewhat surprisingly, starting salary does not seem to affect median LSAT very much. Only for the lower rank schools in the regressions on USN&WR rank is the coefficient on salary statistically significant at the 5% level, but this result is not confirmed by the regressions involving USN&WR score.

When we look at the effect of USN&WR rank on the $75^{th}$ percentile LSAT, the picture changes somewhat. Table 4B1 shows that all three coefficients are significant at the 1% level in the OLS regressions, but in the System GMM regressions only the coefficient on USN&WR rank for top-40 schools is statistically significant at the 1% level, while the coefficient for the lower rank schools is significant only at the 15% level. Table 4B2 shows results that are qualitatively similar for the USN&WR scores, except for somewhat smaller significance of the top-40 schools coefficient and a somewhat higher significance of the lower rank schools coefficient. Quantitatively, the projected effect is not large. Looking at the point estimates, a 20 place improvement in rank of a top-40 school (admittedly, an unlikely event) would result in a 1 point increase in the $75^{th}$ percentile of the LSAT scores of the matriculants. A 10 point increase in the overall score of a top-40 school would lead to an almost a 1.5 point improvement in the $75^{th}$ percentile LSAT.

[Insert Table 4B1.]
[Insert Table 4B2.]

When we compare Table 4B1 to Table 4A3 for schools ever ranked in the top 40, we see that USN&WR rank has a stronger effect on the $75^{th}$ percentile LSAT than on the median LSAT. Since the $75^{th}$ percentile LSAT at top-40 schools is controlled by the students with the highest LSATs, it appears that those students are strongly influenced by changes in USN&WR rank. When we compare the results in Table 4B2 to Table 4A1, it looks like the effect of USN&WR score on the LSAT of the lower rank schools is stronger at the median than at the $75^{th}$ percentile.

As before, we also present regressions (**) for LSAT scores (see Tables 4C1 and 4C2). Again, the coefficients are highly statistically significant and as in regressions (*) salary variable is not statistically significant and does not have much effect on our main coefficients of interest.

[Insert Table 4C1]
[Insert Table 4C2]

It is worth noting that, as is often the case, we cannot be completely confident that the dependent variable is actually a function of the independent variable, even though the coefficient is highly significant. As just noted, we find that LSAT varies with the previous year's rank in USN&WR. One possibility is that the matriculants were actually influenced by the scores and ranks published by USN&WR. Another possibility is that some unobserved event caused both the change in USN&WR and the change in LSAT. Suppose that, in the summer of 2010, after most students have chosen their law school, a donor makes a huge gift. Law faculty members hear of the gift and increase the reputation score they give the school in the survey in the fall of 2010. That increases the school's rank in the spring 2011 issue of USN&WR. Although the students deciding on a law school to attend in the fall of 2010 did hear of the gift in time to change their choice of school, most of them had settled their choice before the new information surfaced and it does not show up in the LSAT median in the fall of 2010. However, students deciding on a school for the fall of 2011 also hear of the gift and hear of it in time to consider it, and that enhances the LSAT of the students matriculating that fall. In our regressions, it would look like the USN&WR publication in the spring of 2011 moved the students, but instead it could have been the huge gift in the summer of 2010 that provided the push.

The key assumptions in the example are that the event occurred in the window of time after the students made their decisions that became part of the 2011 ranking but before faculty members made their decisions, and that the students did eventually incorporate it directly, rather than by hearing of it through USN&WR. This window of opportunity for events that confound the LSAT results is not well defined because students do not all decide at the same time, but is roughly from the schools' admissions deadlines sometime in April through the summer and up to the time the faculty and lawyers are surveyed in the fall. Because the UGPA, discussed below, also depends on student choices, events during the same window of time could lead to similar misattribution of causation regarding changes in the UGPA. Therefore, caution is appropriate when interpreting the results of the regressions of both LSAT and UGPA on USN&WR rank or score. With regard to the academic and lawyer reputation survey variables discussed above, there is no similar window for events to occur that would confound the results of our study. This is so because there is no major factor in the USN&WR formula that could be affected by information released after the academics and lawyers are surveyed; the numbers going into the ranking are set in stone when those groups are surveyed in the fall. For example, a big gift in the winter would not be picked up in the reputation surveys until the next fall, but would not have any opportunity to influence the ranking published in the spring as it would not be incorporated into any of the other factors included by USN&WR in that ranking. Therefore, while there is some chance of misattribution when testing for influence of USN&WR on LSAT and UGPA scores, there is far less chance of that error when it comes to the reputation surveys.

Another component of the USN&WR index closely related to LSAT scores is the acceptance rate. If a school experiences an increase in higher quality applications as a consequence of increased USN&WR rank, it can be more selective in its acceptance decisions. A natural conjecture therefore would be that the relationship of acceptance rates to USN&WR scores is similar to that between median LSATs and USN&WR scores. This conjecture is supported by the results presented in Table 4D which show a highly statistically significant negative relationship between USN&WR scores lagged one year and acceptance rates in System GMM regressions for the entire sample as well as for both subsamples of schools. The results are much weaker in the fixed effects OLS regressions, but as we noted earlier, this specification is problematic for our data.

[Insert Table 4D]

*UGPA*

As another indicator of whether law school applicants respond to USN&WR rankings, we regressed UGPA statistics on USN&WR score and rank. The theory here is the same as for the LSAT, although the presumption that matriculants are the primary drivers of the numbers is not as strong because law schools have not tried as hard to maximize their UGPA median as they have to maximize their LSAT median. As a result, changing school behavior is likely to have played a larger role in the changes seen in a school's median UGPA, meaning it is less likely that USN&WR is driving this number through matriculant behavior. In addition, unlike the LSAT's, the UGPA's signal of applicant quality strongly depends on the undergraduate school the applicant attended. This fact presumably is taken into account and adjusted for in law school admissions processes. From the statistical point of view, this most likely results in a greater amount of noise in the UGPA coefficients in our regressions. Nevertheless, the median UGPA can still be viewed as one indicator of the attractiveness of a school to prospective students.

As can be seen in Table 5A1, the OLS regression on USN&WR rank yields results that are weaker when UGPA median is the dependent variable than in the regressions above where LSAT median is the dependent variable, with a 5% effect for top-40 schools and no significant effect overall or for lower rank schools. Using System GMM, however, the impact of USN&WR rank is statistically significant at 1% for the top schools, for lower rank schools, and for all schools taken together. In terms of numerical importance, an increase in rank by 10 places results in almost 0.2 improvement of UGPA in the following year based on the coefficient estimate for all schools. Over five years, the impact on UGPA approximately doubles. A one standard deviation increase in the overall score leads to about one half standard deviation increase in UGPA the following year. After five years, the increase is almost one standard deviation of UGPA. Table 5A2 shows the effect of USN&WR score to be similar to the effect of rank.

[Insert Table 5A1.]
[Insert Table 5A2.]
[Insert Table 5B.]

Introducing an independent salary variable into the median UGPA regressions makes little difference to the System GMM regressions. In the OLS regressions, the addition of the salary variable increases the statistical significance of the coefficient on USN&WR score to the 5% level for all schools and for the subgroup of top-40 schools. The net result parallels what we found in the LSAT regressions; USN&WR rank or score does appear to influence the behavior of students who enroll in law school, which in turn echoes back to USN&WR via the median UGPA of the students who matriculate at law schools.

As the results in Table 5C indicate, regressions (**) also produce highly statistically significant coefficients that are robust to the addition of the starting salary variable, which itself is not statistically significant.

[Insert Table 5C]

*Starting salary*

The above estimates suggest that USN&WR assessments influence law schools' reputations among academics and lawyers and also the behavior of matriculants. Do lawyers also pay attention to USN&WR when they hire graduating law students? To address this question, we regressed median starting salary for a school on lagged USN&WR score and rank. For many entry level law jobs, all persons hired by a given employer are paid the same salary. Therefore, we do not expect the salary of a particular employee at a particular employer to vary according to which school she attended, much less the rank of her school. The connection is less direct. Although some extremely competitive jobs in the government and not-for-profit sectors do not pay top dollar, we would expect that better graduates are more likely to place with higher paying employers. Therefore, a higher quality graduating class is expected to command higher median salary. The quality of a law school's graduating class should be a function of the aptitude and effort of the students and the quality of their training. The quality of training might be indicated by a school's rank or score in USN&WR. If so, a school's improvement in USN&WR would generally lead to greater success placing its students with higher paying employers, and the school's median salary would increase. The aptitude of potential employees might be assessed by employers in a couple of ways. One would be a group assessment taken from the median LSAT of the whole class. In other words, the employer might use the median LSAT as a general indicator of the aptitude of each member of the class. Another possibility is individual assessment. The employer might make a personal judgment of each applicant's ability during a job interview or, better yet, during an internship. It is possible that some of the same sorts of ability detected by the employer in person can also be detected by the LSAT.[20] Therefore, for two reasons, the median LSAT of a graduating class might be a factor in the median starting salary of that class.

In order to test the effects of these two factors, USN&WR score (or rank) and median LSAT score, on starting salary, we regress a logarithm of median starting salary on their appropriately lagged values. Of the employees whose salaries are reported by USN&WR in year $t$, most graduated in year $t-2$, and started law school in year $t-5$. The median LSAT of the students who entered in year $t-5$ would have been published by USN&WR in year $t-4$. Therefore, we use LSAT scores lagged four years as a proxy for the job applicant's ability that could be discovered by the employer.

Determining the proper lag for school rank or score is more complicated. Some employers might simply look at the rank or score of the potential employee's school at the time the hiring decision

[20] We note that prospective employers do not necessarily observe the applicant's LSAT scores. In fact, they are prohibited from asking for the scores. All we are saying is that LSAT scores reflect ability and this ability could be at least imperfectly observed during a job interview or an internship.

is being made. Those hiring decisions are made during the 2L and 3L years and after graduation, and the latest USN&WR measure of school quality for each decision would be the information in the publications $(t-4), (t-3)$ and $(t-2)$. Other employers might consider the rank or score for all three of the years of the potential employee's education, which were those same three years. So, for these two reasons, we averaged the USN&WR score or rank for those three years, creating a new independent variable to be a possible approximation of school quality as perceived by employers.

[Insert Table 6A.]
[Insert Table 6B.]

As both the OLS and System GMM results in Tables 6A and 6B indicate, when we account for median LSAT, USN&WR rank exerts no significant influence on the starting salaries of either subgroup of law school graduates, those from top-40 schools or those from schools always ranked lower, or the combined group of all schools. We estimated the same regressions limited to the years 2006-2013, but the coefficients on USN&WR were, once again, insignificant. In the regression of salary on USN&WR score using all years and all schools, we do find an effect for the LSAT in the System GMM regression. The coefficient on LSAT is significant at the 5% level, see Table 6A.

One could argue that salary data should be adjusted for the likelihood of getting a job. For this reason we also run regressions similar to those presented in Table 6A for employment at graduation and for logarithm of median salary adjusted for employment at graduation. Not surprisingly, we obtain results that are broadly similar to those for median salary regressions; USN&WR scores are not statistically significant in any specification, but median LSAT scores are highly statistically significant for the entire sample and for some of the subsamples in System GMM regressions. As in many cases before, fixed effects regressions exhibit considerably weaker results. The results of both specifications are shown in Tables 6C and 6D.

[Insert Table 6C]
[Insert Table 6D]

When we use USN&WR rank instead of score, no relevant coefficients are statistically significant, presumably because rank data are less informative than score data.

We also ran regressions using employment nine months after graduation and salary adjusted for this employment indicator. No relevant coefficients were statistically significant at the 5% level in these regressions. These results are available upon request.

To be clear, our results do not mean that students from lower rank schools earn as much as students from higher rank schools. We are controlling for school fixed effect and looking only for the effect on salary when a school rank changes in USN&WR. We find no evidence that USN&WR by itself is driving salary. It is worth noting, however, that we do not have as much confidence in our salary data as our other data, in part because they are less abundant and in part because they do not seem to be as reliable as most of our other data.

*Tuition*

To determine whether law school administrators, university administrators, and trustees are influenced by USN&WR when they set tuition, we regressed tuition on USN&WR score and rank. The theory, plain to see, is that when a school's USN&WR rank increases, administrators will think that their product is more attractive and therefore they can charge a higher price for it. Note that we did not examine this relationship for all schools. There are a number of schools that reported tuition below $10,000 per year. It would seem that many of those are keeping tuition low in order to improve access for students that lack access to capital. If that is part of a school's reason for being, it is unlikely that a shift in rank would free the administrators to increase tuition. Therefore, the analysis we present in Tables 7A and 7B is limited to schools with yearly tuition above $10,000, for which the results are indeed stronger than for the whole group of schools.

We estimated the following equation:

$$TUITION_{i,t} = b_1 + b_2 \times TUITION_{i,t-1} + b_3 \times USN\_RANK_{i,t-2} + \varepsilon, \qquad (6)$$

where $TUITION$ is either out-of-state tuition or private tuition.[21]

[Insert Table 7A.]

Table 7A shows that using fixed effects OLS, the effect of USN&WR rank is not significant at the 10% level for all schools or for the top-40 subgroup. It is significant at the 10% level for the schools not ranked in the top 40. Using System GMM, however, a connection comes into view. With System GMM, we see results that are significant at the 5% level for all schools and also for the schools that have never been ranked in the top 40. The coefficient is about the same for top-40 schools, but it is not statistically significant. A similar picture with more contrast emerges from regressions based on USW&WR score. The coefficient for the top-40 schools is insignificant, but the coefficients for the lower subgroup and all schools are significant at the 1% level. Changes in USN&WR's assessment do appear to influence administrators setting tuition for law schools, at least for schools of lower rank.

[Insert Table 7B.]

*Bar Passage Rate*

To complete the investigation of the available factors in the USN&WR formula, we tested bar passage rate to see whether it seems to be directly influenced by USN&WR. When we regressed this rate as a dependent variable on its lagged value, overall score lagged two years, and LSAT

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[21] We also tried using school rank and score lagged two years instead of one, and the results were similar to those in Tables 7A and 7B.

lagged four years, only the LSATs were statistically significant. This result seems consistent with our finding that employers do not respond to changes in USN&WR in their hiring of law graduates.

## CONCLUSION

We set out to determine whether USN&WR influences academics and lawyers responding to USN&WR surveys of law school quality, law school applicants choosing where to matriculate, employers hiring law school graduates, and administrators setting tuition. With respect to school reputations and law school applicants, our work differs from similar studies in that we incorporate more recent data and apply econometric techniques that are better suited to these data. Nonetheless, we largely confirm the existing results that reputations among law faculty members, lawyers, and applicants are to some degree influenced by USN&WR scores or rankings. However, by contrast to the results in the existing literature, our results suggest that since 1998 this influence is for the most part much stronger when it comes to schools of lower rank, specifically those schools that have never occupied one of the top 40 spots. These results confirm the existence of an echo effect that, by infecting 65% of the formula, undermines the meaningfulness of the rankings published by USN&WR. The echo effect also increases incentives for the schools to game the system on the factors in the USN&WR formula (ethically or unethically) because changes in one year will ripple into future years.

The magnitude of the echo in each variable is not huge. However, a few of the variables may add together to form a larger effect on USN&WR rank. The publication changes reputations among academics, lawyers and judges, and students, and all of those changes feed back into the USN&WR formula for the next year. We also find that whoever sets tuition at some of the lower rank law schools seems to respond to changes in USN&WR ranking or score.

Our results with respect to starting salaries of the graduates and law school tuition are novel but less conclusive than the results for reputation. In none of six different System GMM specifications did we find a significant effect of USN&WR on median salaries of law graduates. Similarly, the coefficients on USN&WR score are not significant in regressions where the dependent variable is employment at graduation or nine months later. In short, we do not find evidence that employers pay attention to changes in USN&WR when hiring law school graduates.

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TABLES

## TABLES

Table 1. Summary statistics for schools ranked by USN&WR

| | All schools | | | Top 40 | | | Rank>40 | | | Public | | | Private | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Obs. | Mean | STD | Obs. | Mean | STD | Obs. | Mean | STD | Obs. | Mean | STD | Obs. | Mean | STD |
| Overall rank | 1712 | 49.2 | 34.4 | 996 | 25.4 | 15.5 | 716 | 82.3 | 24.7 | 840 | 51.1 | 30.4 | 872 | 47.4 | 37.8 |
| Overall score | 1716 | 59.8 | 17.9 | 997 | 71.3 | 14.0 | 719 | 43.9 | 7.4 | 844 | 57.4 | 14.8 | 872 | 62.1 | 20.1 |
| Academic reputation | 1511 | 3.06 | .79 | 810 | 3.63 | .63 | 701 | 2.40 | .27 | 741 | 2.98 | .66 | 770 | 3.14 | .89 |
| Lawyer reputation | 1511 | 3.34 | .65 | 810 | 3.79 | .55 | 701 | 2.82 | .27 | 741 | 3.24 | .56 | 770 | 3.44 | .72 |
| LSAT Median | 1711 | 161.5 | 4.45 | 996 | 164.0 | 3.75 | 715 | 158.1 | 2.73 | 840 | 160.4 | 3.54 | 871 | 162.6 | 4.93 |
| LSAT $75^{th}$ percentile | 1563 | 163.6 | 4.29 | 856 | 166.2 | 3.67 | 707 | 160.4 | 2.38 | 768 | 162.6 | 3.33 | 795 | 164.5 | 4.87 |
| UGPA Median | 1460 | 3.52 | .15 | 763 | 3.61 | .14 | 697 | 3.43 | .11 | 714 | 3.52 | .13 | 746 | 3.52 | .17 |
| Median priv. sector starting salary | 1291 | 92660 | 28321 | 619 | 108762 | 27645 | 672 | 77828 | 19458 | 625 | 83330 | 24291 | 666 | 101416 | 29045 |
| Tuition (out-of-state or private) | 1299 | 32257 | 9743 | 616 | 34444 | 9444 | 683 | 30284 | 9593 | 634 | 28976 | 9363 | 665 | 35385 | 9051 |

Table 2A. Effect of USN&WR score on law school reputation among academics (fixed effects OLS and System GMM estimator)

Dependent variable: Reputation score from academics in year $t$

| | Fixed Effects OLS | | | System GMM | | |
|---|---|---|---|---|---|---|
| | All obs. | Top 40 | Rank>40 | All obs. | Top 40 | Rank>40 |
| Academic Reputation $(t-1)$ | .318***<br>(.034) | .338***<br>(.045) | .283***<br>(.057) | .637***<br>(.127) | .134<br>(1.88) | .603***<br>(.104) |
| USN&WR score $(t-1)$ | .006***<br>(.001) | .005***<br>(.001) | .007***<br>(.002) | .007***<br>(.002) | .003<br>(.007) | .0032*<br>(.0018) |
| Observations | 1314 | 712 | 602 | 1314 | 712 | 602 |
| Groups | 148 | 52 | 96 | 148 | 52 | 96 |
| Instruments | - | - | - | 65 | 18 | 65 |
| Hansen test p-value | - | - | - | .213 | .426 | .816 |
| p-value for $H_0$: no autocorrelation in order 2 residuals | - | - | - | .592 | .776 | .703 |
| R-Squared (within) | .431 | .512 | .378 | - | - | - |

Notes:
(1) P-values based on robust standard errors are in parentheses; in fixed effects regressions errors are clustered by school.
(2) *** - statistically significant at 1%; ** - statistically significant at 5%; * - statistically significant at 10%.
(3) All regressions include a dummy variable for each year and a constant.

Table 2B. Effect of USN&WR rank on law school reputation among academics (fixed effects OLS and System GMM estimator)

Dependent variable: Reputation score from academics in year $t$

| | Fixed Effects OLS | | | System GMM | | |
|---|---|---|---|---|---|---|
| | All obs. | Top 40 | Rank>40 | All obs. | Top 40 | Rank>40 |
| Academic Reputation $(t-1)$ | .464***<br>(.048) | .512***<br>(.057) | .384***<br>(.057) | .689***<br>(.140) | .923***<br>(.117) | .612***<br>(.041) |
| USN&WR rank $(t-1)$ | -.0014***<br>(.0004) | -.002***<br>(.0006) | -.0014***<br>(.0004) | -.0008**<br>(.0004) | .0035<br>(.0035) | -.0006*<br>(.0003) |
| Observations | 1363 | 758 | 605 | 1310 | 711 | 599 |
| Groups | 149 | 52 | 97 | 148 | 52 | 96 |
| Instruments | - | - | - | 65 | 18 | 81 |
| Hansen test p-value | - | - | - | .159 | .724 | .749 |
| p-value for $H_0$: no autocorrelation in order 2 residuals | - | - | - | .864 | .217 | .454 |
| R-Squared (within) | .417 | .500 | .350 | - | - | - |

Notes:
(1) P-values based on robust standard errors are in parentheses; in fixed effects regressions errors are clustered by school.
(2) *** - statistically significant at 1%; ** - statistically significant at 5%; * - statistically significant at 10%.
(3) All regressions include a dummy variable for each year and a constant.

Table 2C. Comparisons of the Effects of USN&WR score and rank, and LSAT score, on law school reputation among academics (System GMM estimator)

Dependent variable: Reputation score from academics in year $t$

| | USN&WR score and LSAT included | USN&WR score only | LSAT only | USN&WR rank and LSAT included | USN&WR rank only |
|---|---|---|---|---|---|
| Academic Reputation $(t-1)$ | .700***<br>(.116) | .637***<br>(.127) | .785***<br>(.098) | .781***<br>(.109) | .689***<br>(.140) |
| USN&WR score $(t-1)$ | .006**<br>(.003) | .007***<br>(.002) | - | - | - |
| USN&WR rank $(t-1)$ | - | - | - | -.0004<br>(.0005) | -.0008**<br>(.0004) |
| Median LSAT $(t-1)$ | -.005<br>(.004) | - | .005**<br>(.002) | .002<br>(.004) | - |
| Observations | 1314 | 1314 | 1314 | 1310 | 1310 |
| Groups | 148 | 148 | 148 | 148 | 148 |
| Instruments | 92 | 65 | 89 | 92 | 65 |
| Hansen test p-value | .338 | .213 | .226 | .175 | .159 |
| p-value for $H_0$: no autocorrelation in order 2 residuals | .466 | .592 | .495 | .421 | .864 |

Notes:
(1) P-values based on robust standard errors are in parentheses.
(2) *** - statistically significant at 1%; ** - statistically significant at 5%; * - statistically significant at 10%.
(3) All regressions include a dummy variable for each year and a constant.

Table 2D. Effect of rank difference on law school reputation score among academics (fixed effects)

| Dependent variable: / Regressors | Change in reputation score from academics in year T | | | | | |
|---|---|---|---|---|---|---|
| | All obs. | Top 40 | Rank>40 | All obs. | Top 40 | Rank>40 |
| Difference between academic reputation rank and overall rank (t-1) | .003***<br>(.0004) | .004***<br>(.0006) | .003***<br>(.0004) | .003***<br>(.0004) | .004***<br>(.0006) | .002***<br>(.0004) |
| LSAT scores (t-1) – LSAT scores (t-2) | - | - | - | .005*<br>(.003) | .0001<br>(.0036) | .010**<br>(.004) |
| Observations | 1363 | 758 | 605 | 1363 | 758 | 605 |
| Groups | 149 | 52 | 97 | 149 | 52 | 97 |
| R-Squared (within) | .215 | .235 | .265 | .218 | .235 | .277 |

Notes:
(1) p-values based on robust standard errors are in parentheses; regression errors are clustered by school
(2) *** - statistically significant at 1%; ** - statistically significant at 5%; * - statistically significant at 10%;
(3) all regressions include a dummy variable for each year and a constant.

Table 3A. Effect of USN&WR score on law school reputation among lawyers and judges (fixed effects OLS and System GMM estimator)

Dependent variable: Reputation score from lawyers and judges in year $t$

| | Fixed Effects OLS | | | System GMM | | |
|---|---|---|---|---|---|---|
| | All obs. | Top 40 | Rank>40 | All obs. | Top 40 | Rank>40 |
| Lawyer and Judge Reputation $(t-1)$ | .343***<br>(.047) | .532***<br>(.053) | .157**<br>(.070) | .471***<br>(.056) | 1.44***<br>(.156) | .392***<br>(.121) |
| USN&WR score $(t-1)$ | .002<br>(.002) | -.0007<br>(.0022) | .007**<br>(.003) | .013***<br>(.003) | -.013<br>(.014) | .016***<br>(.004) |
| Observations | 1367 | 759 | 608 | 1314 | 759 | 602 |
| Groups | 149 | 52 | 97 | 148 | 52 | 96 |
| Instruments | - | - | - | 116 | 19 | 65 |
| Hansen test p-value | - | - | - | .263 | .606 | .664 |
| p-value for $H_0$: no autocorrelation in order 2 residuals | - | - | - | .226 | .239 | .493 |
| R-Squared (within) | .481 | .500 | .573 | - | - | - |

Notes:
(1) P-values based on robust standard errors are in parentheses; in fixed effects regressions errors are clustered by school.
(2) *** - statistically significant at 1%; ** - statistically significant at 5%; * - statistically significant at 10%.
(3) All regressions include a dummy variable for each year and a constant.

Table 3B. Effect of USN&WR rank on law school reputation among lawyers and judges (fixed effects OLS and System GMM estimator)

Dependent variable: Reputation score from lawyers and judges in year $t$

| | Fixed Effects OLS | | | System GMM | | |
|---|---|---|---|---|---|---|
| | All obs. | Top 40 | Rank>40 | All obs. | Top 40 | Rank>40 |
| Lawyer and Judge Reputation $(t-1)$ | .330***<br>(.047) | .512***<br>(.057) | .159**<br>(.070) | .676***<br>(.050) | 1.10***<br>(.156) | .358***<br>(.119) |
| USN&WR rank $(t-1)$ | -.0014***<br>(.0006) | -.002***<br>(.0006) | -.0017**<br>(.0007) | -.0014***<br>(.0004) | .0015<br>(.0022) | -.0042***<br>(.0009) |
| Observations | 1363 | 758 | 605 | 1310 | 711 | 599 |
| Groups | 149 | 52 | 97 | 148 | 52 | 96 |
| Instruments | - | - | - | 116 | 18 | 62 |
| Hansen test p-value | - | - | - | .138 | .134 | .664 |
| p-value for $H_0$: no autocorrelation in order 2 residuals | - | - | - | .353 | .361 | .733 |
| R-Squared (within) | .483 | .500 | .456 | - | - | - |

Notes:
(1) P-values based on robust standard errors are in parentheses; in fixed effects regressions errors are clustered by school.
(2) *** - statistically significant at 1%; ** - statistically significant at 5%; * - statistically significant at 10%.
(3) All regressions include a dummy variable for each year and a constant.

Table 3C. Comparisons of the Effects of USN&WR score and rank, and median LSAT, on law school reputation among lawyers and judges (System GMM estimator)

Dependent variable: Reputation score from lawyers and judges in year $t$

| | USN&WR score and LSAT included | USN&WR score only | LSAT only | USN&WR rank and LSAT included | USN&WR rank only |
|---|---|---|---|---|---|
| Lawyer and Judge Reputation $(t-1)$ | .577*** (.046) | .471*** (.056) | .692*** (.052) | .620*** (.054) | .676*** (.050) |
| USN&WR Score $(t-1)$ | .007*** (.003) | .013*** (.003) | - | - | - |
| USN&WR rank $(t-1)$ | - | - | - | -.0012* (.0007) | -.0014*** (.0004) |
| Median LSAT $(t-1)$ | .005 (.005) | - | .017*** (.004) | .0038 (.0045) | - |
| Observations | 1314 | 1314 | 1314 | 1310 | 1310 |
| Groups | 148 | 148 | 148 | 129 | 148 |
| Instruments | 132 | 116 | 116 | 87 | 116 |
| Hansen test p-value | .442 | .263 | .180 | .421 | .138 |
| p-value for $H_0$: no autocorrelation in order 2 residuals | .345 | .226 | .537 | .179 | .353 |

Notes:
(1) P-values based on robust standard errors are in parentheses.
(2) *** - statistically significant at 1%; ** - statistically significant at 5%; * - statistically significant at 10%.
(3) All regressions include a dummy variable for each year and a constant.

Table 3D. Effect of rank difference on law school reputation among lawyers and judges (fixed effects)

| Regressors \ Dependent variable: | Change in reputation score from lawyers in year T | | | | | |
|---|---|---|---|---|---|---|
| | All obs. | Top 40 | Rank>40 | All obs. | Top 40 | Rank>40 |
| Difference between reputation rank among lawyers and overall rank | .006***<br>(.0005) | .008***<br>(.0010) | .006***<br>(.0006) | .006***<br>(.0005) | .008***<br>(.0010) | .006***<br>(.0006) |
| LSAT scores (t-1) – LSAT scores (t-2) | - | - | - | -.004<br>(.004) | .001<br>(.005) | -.008<br>(.008) |
| Observations | 1363 | 758 | 605 | 1363 | 758 | 605 |
| Groups | 149 | 52 | 97 | 149 | 52 | 97 |
| R-Squared (within) | .356 | .279 | .457 | .357 | .279 | .459 |

Notes:
(1) p-values based on robust standard errors are in parentheses; regression errors are clustered by school
(2) *** - statistically significant at 1%; ** - statistically significant at 5%; * - statistically significant at 10%;
(3) all regressions include a dummy variable for each year and a constant.

Table 4A1. Effect of USN&WR score on median LSAT score of law school matriculants (fixed effects OLS and System GMM estimator)

Dependent variable: Median LSAT in year $t$

| | Fixed Effects OLS | | | System GMM | | |
|---|---|---|---|---|---|---|
| | All obs. | Top 40 | Rank>40 | All obs. | Top 40 | Rank>40 |
| Median LSAT $(t-1)$ | .560***<br>(.029) | .622***<br>(.031) | .402***<br>(.048) | .567***<br>(.180) | .451<br>(.290) | .538***<br>(.137) |
| USN&WR score $(t-1)$ | .047***<br>(.014) | .028*<br>(.016) | .080***<br>(.017) | .071***<br>(.025) | .062**<br>(.030) | .123***<br>(.025) |
| Observations | 1568 | 945 | 623 | 1518 | 898 | 620 |
| Groups | 149 | 52 | 97 | 149 | 52 | 97 |
| Instruments | - | - | - | 24 | 22 | 82 |
| Hansen test p-value | - | - | - | .610 | .666 | .994 |
| p-value for $H_0$: no autocorrelation in order 2 residuals | - | - | - | .846 | .635 | .720 |
| R-Squared (within) | .734 | .811 | .480 | - | - | - |

Notes:
(1) P-values based on robust standard errors are in parentheses; in fixed effects regressions errors are clustered by school.
(2) *** - statistically significant at 1%; ** - statistically significant at 5%; * - statistically significant at 10%.
(3) All regressions include a dummy variable for each year and a constant.

Table 4A2. Effect of USN&WR score and logarithm of starting salary on median LSAT score of law school matriculants (fixed effects and System GMM estimator)

Dependent variable: Median LSAT in year $t$

| | Fixed Effects OLS | | | System GMM | | |
|---|---|---|---|---|---|---|
| | All obs. | Top 40 | Rank>40 | All obs. | Top 40 | Rank>40 |
| Median LSAT $(t-1)$ | .535***<br>(.032) | .601***<br>(.038) | .417***<br>(.049) | .841***<br>(.086) | .527***<br>(.079) | .382**<br>(.165) |
| USN&WR score $(t-1)$ | .048***<br>(.016) | .029<br>(.021) | .068***<br>(.018) | .036*<br>(.015) | .098***<br>(.021) | .059*<br>(.034) |
| Logarithm of median starting salary $(t-1)$ | .503*<br>(.298) | .245<br>(.491) | .251<br>(.365) | .628#<br>(.397) | -.029<br>(.538) | .759<br>(.502) |
| Observations | 1401 | 801 | 600 | 1401 | 801 | 600 |
| Groups | 149 | 52 | 97 | 149 | 52 | 97 |
| Instruments | - | - | - | 108 | 22 | 93 |
| Hansen test p-value | - | - | - | .248 | .413 | .941 |
| p-value for $H_0$: no autocorrelation in order 2 residuals | - | - | - | .291 | .102 | .701 |
| R-Squared (within) | .732 | .820 | .480 | - | - | - |

Notes:
(1) P-values based on robust standard errors are in parentheses; in fixed effects regressions errors are clustered by school.
(2) *** - statistically significant at 1%; ** - statistically significant at 5%; * - statistically significant at 10%; # - significant at 15%.
(3) All regressions include time dummies and a constant.

Table 4A3. Effect of USN&WR rank on median LSAT score of law school matriculants (fixed effects OLS and System GMM estimator)

Dependent variable: Median LSAT in year $t$

| | Fixed Effects OLS | | | System GMM | | |
|---|---|---|---|---|---|---|
| | All obs. | Top 40 | Rank>40 | All obs. | Top 40 | Rank>40 |
| Median LSAT $(t-1)$ | .550*** (.028) | .590*** (.031) | .428*** (.048) | .801*** (.040) | .528*** (.230) | .550*** (.102) |
| USN&WR rank $(t-1)$ | -.022*** (.003) | -.035*** (.005) | -.017*** (.004) | -.011** (.005) | -.024* (.014) | -.024*** (.007) |
| Observations | 1564 | 944 | 620 | 1514 | 897 | 617 |
| Groups | 149 | 52 | 97 | 149 | 52 | 97 |
| Instruments | - | - | - | 120 | 22 | 79 |
| Hansen test p-value | - | - | - | .244 | .753 | .978 |
| p-value for $H_0$: no autocorrelation in order 2 residuals | - | - | - | .317 | .755 | .878 |
| R-Squared (within) | .734 | .815 | .471 | - | - | - |

Notes:
(1) P-values based on robust standard errors are in parentheses; in fixed effects regressions errors are clustered by school.
(2) *** - statistically significant at 1%; ** - statistically significant at 5%; * - statistically significant at 10%.
(3) All regressions include a dummy variable for each year and a constant.

Table 4A4. Effect of USN&WR rank and logarithm of starting salary on median LSAT score of law school matriculants (fixed effects OLS and System GMM estimator)

Dependent variable: Median LSAT in year $t$

| | Fixed Effects OLS | | | System GMM | | |
|---|---|---|---|---|---|---|
| | All obs. | Top 40 | Rank>40 | All obs. | Top 40 | Rank>40 |
| Median LSAT $(t-1)$ | .525***<br>(.031) | .560***<br>(.037) | .439***<br>(.049) | .803***<br>(.081) | .503***<br>(.080) | .575***<br>(.107) |
| USN&WR rank $(t-1)$ | -.020***<br>(.004) | -.041***<br>(.007) | -.014***<br>(.004) | -.016***<br>(.005) | -.038**<br>(.015) | -.015***<br>(.006) |
| Logarithm of starting salary $(t-1)$ | .517*<br>(.302) | .363<br>(.469) | .234<br>(.366) | .435<br>(.391) | .561<br>(.559) | .730**<br>(.348) |
| Observations | 1397 | 800 | 597 | 1397 | 800 | 597 |
| Groups | 149 | 52 | 97 | 149 | 52 | 97 |
| Instruments | - | - | - | 108 | 22 | 90 |
| Hansen test p-value | - | - | - | .364 | .251 | .910 |
| p-value for $H_0$: no autocorrelation in order 2 residuals | - | - | - | .142 | .113 | .862 |
| R-Squared (within) | .731 | .824 | .470 | - | - | - |

Notes:
(1) P-values based on robust standard errors are in parentheses; in fixed effects regressions errors are clustered by school.
(2) *** - statistically significant at 1%; ** - statistically significant at 5%; * - statistically significant at 10%.
(3) All regressions include a dummy variable for each year and a constant.

Table 4B1. Effect of USN&WR rank on 75th percentile LSAT of law school matriculants (fixed effects OLS and System GMM estimator)

Dependent variable: 75th percentile LSAT in year $t$

| | Fixed Effects OLS | | | System GMM | | |
|---|---|---|---|---|---|---|
| | All obs. | Top 40 | Rank>40 | All obs. | Top 40 | Rank>40 |
| 75th percentile LSAT $(t-1)$ | .454***<br>(.035) | .458***<br>(.045) | .391***<br>(.054) | .852***<br>(.091) | 1.07***<br>(.319) | .561***<br>(.111) |
| USN&WR rank $(t-1)$ | -.019***<br>(.003) | -.052***<br>(.008) | -.009***<br>(.004) | -.009**<br>(.005) | -.050***<br>(.017) | -.010#<br>(.006) |
| Observations | 1361 | 757 | 604 | 1361 | 710 | 604 |
| Groups | 149 | 52 | 97 | 149 | 52 | 97 |
| Instruments | - | - | - | 72 | 18 | 67 |
| Hansen test p-value | - | - | - | .302 | .181 | .823 |
| p-value for $H_0$: no autocorrelation in order 2 residuals | - | - | - | .385 | .282 | .894 |
| R-Squared (within) | .650 | .768 | .360 | - | - | - |

Notes:
(1) P-values based on robust standard errors are in parentheses; in fixed effects regressions errors are clustered by school.
(2) *** - statistically significant at 1%; ** - statistically significant at 5%; * - statistically significant at 10%; # - significant at 15%.
(3) All regressions include a dummy variable for each year and a constant.

Table 4B2. Effect of USN&WR score on 75th percentile LSAT of law school matriculants (fixed effects OLS and System GMM estimator)

Dependent variable: 75th percentile LSAT in year $t$

| | Fixed Effects OLS | | | System GMM | | |
|---|---|---|---|---|---|---|
| | All obs. | Top 40 | Rank>40 | All obs. | Top 40 | Rank>40 |
| 75th percentile LSAT $(t-1)$ | .472***<br>(.035) | .520***<br>(.045) | .375***<br>(.053) | .814***<br>(.109) | -.188<br>(.527) | .526***<br>(.123) |
| USN&WR score $(t-1)$ | .058***<br>(.012) | .054***<br>(.017) | .047***<br>(.018) | .034**<br>(.016) | .143**<br>(.029) | .050*<br>(.029) |
| Observations | 1415 | 804 | 611 | 1365 | 758 | 607 |
| Groups | 149 | 52 | 97 | 149 | 52 | 97 |
| Instruments | - | - | - | 72 | 19 | 70 |
| Hansen test p-value | - | - | - | .280 | .109 | .782 |
| p-value for $H_0$: no autocorrelation in order 2 residuals | - | - | - | .474 | .147 | .707 |
| R-Squared (within) | .659 | .757 | .371 | - | - | - |

Notes:
(1) P-values based on robust standard errors are in parentheses; in fixed effects regressions errors are clustered by school.
(2) *** - statistically significant at 1%; ** - statistically significant at 5%; * - statistically significant at 10%; # - significant at 15%.
(3) All regressions include a dummy variable for each year and a constant.

Table 4C1. Effect of rank difference and logarithm of starting salary on median LSAT score of law school matriculants (fixed effects)

| Dependent variable: / Regressors | Change in LSAT score in year T | | | | | |
|---|---|---|---|---|---|---|
| | All obs. | Top 40 | Rank>40 | All obs. | Top 40 | Rank>40 |
| Difference between LSAT rank and overall rank in (t-1) | .043***<br>(.003) | .056***<br>(.003) | .035***<br>(.004) | .043***<br>(.003) | .064***<br>(.005) | .034***<br>(.004) |
| Logarithm of starting salary (t-1) minus logarithm of starting salary (t-2) | - | - | - | .274<br>(.221) | .024<br>(.323) | .339<br>(.290) |
| Observations | 1564 | 944 | 620 | 1336 | 752 | 584 |
| Groups | 149 | 52 | 97 | 149 | 52 | 97 |
| R-Squared (within) | .313 | .303 | .369 | .314 | .322 | .362 |

Notes:
(1) p-values based on robust standard errors are in parentheses; regression errors are clustered by school
(2) *** - statistically significant at 1%; ** - statistically significant at 5%; * - statistically significant at 10%;
(3) all regressions include a dummy variable for each year and a constant.

Table 4C2. Effect of rank difference and logarithm of starting salary on 75th percentile of LSAT score of law school matriculants (fixed effects)

| Dependent variable: / Regressors | Change in 75th percentile of LSAT score in year T | | | | | |
|---|---|---|---|---|---|---|
| | All obs. | Top 40 | Rank>40 | All obs. | Top 40 | Rank>40 |
| Difference between LSAT rank and overall rank | .021***<br>(.003) | .040***<br>(.006) | .012***<br>(.004) | .022***<br>(.003) | .044***<br>(.005) | .013***<br>(.004) |
| Logarithm of starting salary (t-1) minus logarithm of starting salary (t-2) | - | - | - | .093<br>(.288) | -.385<br>(.372) | .324<br>(.395) |
| Observations | 1411 | 803 | 608 | 1334 | 751 | 583 |
| Groups | 149 | 52 | 97 | 149 | 52 | 97 |
| R-Squared (within) | .176 | .189 | .212 | .178 | .206 | .208 |

Notes:
(1) p-values based on robust standard errors are in parentheses; regression errors are clustered by school
(2) *** - statistically significant at 1%; ** - statistically significant at 5%; * - statistically significant at 10%;
(3) all regressions include a dummy variable for each year and a constant.

Table 4D. Effect of USN&WR score on acceptance rate of law school applicants (fixed effects OLS and System GMM estimator)

Dependent variable: Acceptance rate in year $t$

| | Fixed Effects OLS | | | System GMM | | |
|---|---|---|---|---|---|---|
| | All obs. | Top 40 | Rank>40 | All obs. | Top 40 | Rank>40 |
| Acceptance rate $(t-1)$ | .593***<br>(.028) | .637***<br>(.038) | .502***<br>(.046) | .822***<br>(.039) | .698***<br>(.098) | .783***<br>(.066) |
| USN&WR score $(t-1)$ | -.057<br>(.051) | .003<br>(.051) | -.186*<br>(.105) | -.100***<br>(.021) | -.149***<br>(.045) | .370***<br>(.092) |
| Observations | 1311 | 800 | 511 | 1311 | 800 | 511 |
| Groups | 146 | 52 | 94 | 146 | 52 | 94 |
| Instruments | - | - | - | 86 | 22 | 65 |
| Hansen test p-value | - | - | - | .202 | .526 | .953 |
| p-value for $H_0$: no autocorrelation in order 2 residuals | - | - | - | .258 | .558 | .243 |
| R-Squared (within) | .675 | .727 | .648 | - | - | - |

Notes:
(1) P-values based on robust standard errors are in parentheses; in fixed effects regressions errors are clustered by school.
(2) *** - statistically significant at 1%; ** - statistically significant at 5%; * - statistically significant at 10%.
(3) All regressions include a dummy variable for each year and a constant.

Table 5A1. Effect of USN&WR rank on median UGPA of law school matriculants (fixed effects OLS and System GMM estimator)

Dependent variable: Median UGPA in year $t$

| | Fixed Effects OLS | | | System GMM | | |
|---|---|---|---|---|---|---|
| | All obs. | Top 40 | Rank>40 | All obs. | Top 40 | Rank>40 |
| Median UGPA $(t-1)$ | .547*** (.038) | .592*** (.051) | .432*** (.048) | .558*** (.055) | .339*** (.092) | .576*** (.088) |
| USN&WR rank $(t-1)$ | -.0005 (.0003) | -.0016** (.0007) | -.0004 (.0004) | -.0017*** (.0002) | -.0025*** (.0009) | -.0011*** (.0003) |
| Observations | 1413 | 804 | 609 | 1413 | 804 | 609 |
| Groups | 149 | 52 | 97 | 149 | 52 | 97 |
| Instruments | - | - | - | 77 | 20 | 71 |
| Hansen test p-value | - | - | - | .255 | .409 | .943 |
| p-value for $H_0$: no autocorrelation in order 2 residuals | - | - | - | .699 | .174 | .340 |
| R-Squared (within) | .583 | .698 | .387 | - | - | - |

Notes:
(1) P-values based on robust standard errors are in parentheses; in fixed effects regressions errors are clustered by school.
(2) *** - statistically significant at 1%; ** - statistically significant at 5%; * - statistically significant at 10%.
(3) All regressions include a dummy variable for each year and a constant.

Table 5A2. Effect of USN&WR score on median UGPA of law school matriculants (fixed effects OLS and System GMM estimator)

Dependent variable: Median UGPA in year $t$

| | Fixed Effects OLS | | | System GMM | | |
|---|---|---|---|---|---|---|
| | All obs. | Top 40 | Rank>40 | All obs. | Top 40 | Rank>40 |
| Median UGPA $(t-1)$ | .542***<br>(.038) | .606***<br>(.054) | .425***<br>(.049) | .541***<br>(.067) | .349***<br>(.099) | .583***<br>(.091) |
| USN&WR score $(t-1)$ | .002*<br>(.001) | .0017#<br>(.0011) | .002<br>(.001) | .004***<br>(.0007) | .005***<br>(.001) | .005***<br>(.001) |
| Observations | 1417 | 805 | 612 | 1417 | 805 | 612 |
| Groups | 149 | 52 | 97 | 149 | 52 | 97 |
| Instruments | - | - | - | 77 | 20 | 74 |
| Hansen test p-value | - | - | - | .113 | .317 | .954 |
| p-value for $H_0$: no autocorrelation in order 2 residuals | - | - | - | .649 | .127 | .373 |
| R-Squared (within) | .584 | .696 | .387 | - | - | - |

Notes:
(1) P-values based on robust standard errors are in parentheses; in fixed effects regressions errors are clustered by school.
(2) *** - statistically significant at 1%; ** - statistically significant at 5%; * - statistically significant at 10%; # - significant at 15%.
(3) All regressions include a dummy variable for each year and a constant.

Table 5B. Effect of USN&WR score and starting salary on median UGPA of law school matriculants (fixed effects OLS and System GMM estimator)

Dependent variable: Median UGPA in year $t$

| | Fixed Effects OLS | | | System GMM | | |
|---|---|---|---|---|---|---|
| | All obs. | Top 40 | Rank>40 | All obs. | Top 40 | Rank>40 |
| Median UGPA $(t-1)$ | .535***<br>(.039) | .605***<br>(.053) | .412***<br>(.050) | .617***<br>(.059) | .369***<br>(.088) | .622***<br>(.064) |
| USN&WR score $(t-1)$ | .002**<br>(.001) | .002#<br>(.001) | .002<br>(.001) | .003***<br>(.001) | .005***<br>(.001) | .004***<br>(.001) |
| Logarithm of median starting salary $(t-1)$ | .067***<br>(.025) | .031<br>(.037) | .087***<br>(.031) | .040<br>(.033) | .021<br>(.054) | .018<br>(.033) |
| Observations | 1401 | 801 | 600 | 1401 | 801 | 600 |
| Groups | 149 | 52 | 97 | 149 | 52 | 97 |
| Instruments | - | - | - | 107 | 22 | 93 |
| Hansen test p-value | - | - | - | .194 | .293 | .965 |
| p-value for $H_0$: no autocorrelation in order 2 residuals | - | - | - | .615 | .124 | .348 |
| R-Squared (within) | .590 | .697 | .401 | - | - | - |

Notes:
(1) P-values based on robust standard errors are in parentheses; in fixed effects regressions errors are clustered by school.
(2) *** - statistically significant at 1%; ** - statistically significant at 5%; * - statistically significant at 10%.
(3) All regressions include a dummy variable for each year and a constant.

Table 5C. Effect of rank difference and starting salary on median GPA of law school matriculants (fixed effects)

| Dependent variable: / Regressors | Change in GPA in year T | | | | | |
|---|---|---|---|---|---|---|
| | All obs. | Top 40 | Rank>40 | All obs. | Top 40 | Rank>40 |
| Difference between GPA rank and overall rank | .002***<br>(.0001) | .002***<br>(.0002) | .002***<br>(.0001) | .002***<br>(.0001) | .002***<br>(.0002) | .002***<br>(.0001) |
| Logarithm of starting salary (t-1) minus logarithm of starting salary (t-2) | - | - | - | .030#<br>(.018) | .005<br>(.031) | .040#<br>(.024) |
| Observations | 1413 | 804 | 609 | 1336 | 752 | 584 |
| Groups | 149 | 52 | 97 | 149 | 52 | 97 |
| R-Squared (within) | .260 | .261 | .293 | .261 | .253 | .301 |

Notes:
(1) p-values based on robust standard errors are in parentheses; regression errors are clustered by school
(2) *** - statistically significant at 1%; ** - statistically significant at 5%; * - statistically significant at 10%;
(3) all regressions include a dummy variable for each year and a constant.

Table 6A. Effect of three year average of USN&WR score and LSAT on median starting salary in the private sector (fixed effects OLS and System GMM estimator)

Dependent variable: Median starting salary in the private sector in year $t$

| | Fixed Effects OLS | | | System GMM | | |
|---|---|---|---|---|---|---|
| | All obs. | Top 40 | Rank>40 | All obs. | Top 40 | Rank>40 |
| Median starting salary $(t-1)$ | .239***<br>(.049) | .281***<br>(.044) | .108<br>(.124) | .599***<br>(.110) | .383<br>(.760) | 1.24**<br>(.514) |
| USN&WR score $(t-2, t-3, t-4$ average) | -.0001<br>(.0015) | -.0009<br>(.0012) | -.001<br>(.007) | -.0003<br>(.0016) | -.003<br>(.008) | -.006<br>(.016) |
| Median LSAT $(t-4)$ | .003<br>(.003) | .004<br>(.003) | -.001<br>(.007) | .013**<br>(.006) | .035<br>(.031) | .014<br>(.050) |
| Observations | 1079 | 769 | 310 | 1029 | 723 | 310 |
| Groups | 105 | 52 | 53 | 105 | 52 | 53 |
| Instruments | - | - | - | 97 | 21 | 21 |
| Hansen test p-value | - | - | - | .324 | .138 | .854 |
| p-value for $H_0$: no autocorrelation in order 2 residuals | - | - | - | .672 | .823 | .775 |
| R-Squared (within) | .896 | .933 | .658 | - | - | - |

Notes:
(1) P-values based on robust standard errors are in parentheses; in fixed effects regressions errors are clustered by school.
(2) *** - statistically significant at 1%; ** - statistically significant at 5%; * - statistically significant at 10%; # - significant at 15%.
(3) All regressions include a dummy variable for each year and a constant.

Table 6B. Effect of three year average of USN&WR rank and LSAT on median starting salary in the private sector (fixed effects OLS and System GMM estimator)

Dependent variable: Median starting salary in the private sector in year $t$

| | Fixed Effects OLS | | | System GMM | | |
|---|---|---|---|---|---|---|
| | All obs. | Top 40 | Rank>40 | All obs. | Top 40 | Rank>40 |
| Median starting salary $(t-1)$ | .238***<br>(.048) | .281***<br>(.044) | .106<br>(.127) | .781**<br>(.398) | .606#<br>(.403) | .234<br>(.172) |
| USN&WR rank $(t-2, t-3, t-4$ average) | -.001<br>(.001) | -.0009<br>(.0012) | .0002<br>(.0019) | -.0005<br>(.0013) | -.003<br>(.002) | .006<br>(.007) |
| Median LSAT $(t-4)$ | .002<br>(.003) | .004<br>(.003) | -.0013<br>(.0063) | .002<br>(.024) | .002<br>(.022) | .020<br>(.015) |
| Observations | 1077 | 769 | 308 | 1077 | 769 | 308 |
| Groups | 105 | 52 | 53 | 105 | 52 | 53 |
| Instruments | - | - | - | 22 | 22 | 20 |
| Hansen test p-value | - | - | - | .791 | .433 | .422 |
| p-value for $H_0$: no autocorrelation in order 2 residuals | - | - | - | .225 | .267 | .902 |
| R-Squared (within) | .897 | .933 | .658 | - | - | - |

Notes:
(1) P-values based on robust standard errors are in parentheses; in fixed effects regressions errors are clustered by school.
(2) *** - statistically significant at 1%; ** - statistically significant at 5%; * - statistically significant at 10%; # - significant at 15%.
(3) All regressions include a dummy variable for each year and a constant.

Table 6C. Effect of three year average of USN&WR score and LSAT on employment at graduation (fixed effects OLS and System GMM estimator)

Dependent variable: Median starting salary in the private sector in year $t$

| | Fixed Effects OLS | | | System GMM | | |
|---|---|---|---|---|---|---|
| | All obs. | Top 40 | Rank>40 | All obs. | Top 40 | Rank>40 |
| Employment at graduation $(t-1)$ (in %) | .475***<br>(.057) | .544***<br>(.059) | .127<br>(.135) | .624***<br>(.080) | .547<br>(.119) | 1.62***<br>(.514) |
| USN&WR score $(t-2, t-3, t-4$ average) | -.216<br>(.135) | -.139<br>(.121) | -1.54**<br>(.728) | .0003<br>(.0004) | -.111<br>(.205) | -1.19<br>(1.85) |
| Median LSAT $(t-4)$ | .270<br>(.258) | .156<br>(.279) | 1.16**<br>(.469) | 1.17***<br>(.293) | 1.31***<br>(.425) | 1.53<br>(.938) |
| Observations | 945 | 679 | 266 | 945 | 679 | 254 |
| Groups | 102 | 52 | 50 | 102 | 52 | 48 |
| Instruments | - | - | - | 94 | 20 | 18 |
| Hansen test p-value | - | - | - | .302 | .470 | 1.00 |
| p-value for $H_0$: no autocorrelation in order 2 residuals | - | - | - | .985 | .478 | .303 |
| R-Squared (within) | .497 | .500 | .584 | - | - | - |

Notes:
(1) P-values based on robust standard errors are in parentheses; in fixed effects regressions errors are clustered by school.
(2) *** - statistically significant at 1%; ** - statistically significant at 5%; * - statistically significant at 10%; # - significant at 15%.
(3) All regressions include a dummy variable for each year and a constant.

Table 6D. Effect of three year average of USN&WR score and LSAT on starting salary adjusted for employment at graduation (fixed effects OLS and System GMM estimator)

Dependent variable: Median starting salary in the private sector adjusted for employment at graduation in year $t$

| | Fixed Effects OLS | | | System GMM | | |
|---|---|---|---|---|---|---|
| | All obs. | Top 40 | Rank>40 | All obs. | Top 40 | Rank>40 |
| Median starting salary adjusted for employment at graduation $(t-1)$ (in %) | .436*** (.057) | .496*** (.066) | .089 (.129) | .689*** (.069) | .848*** (.329) | .414** (.172) |
| USN&WR score $(t-2, t-3, t-4$ average) | -.0005 (.0028) | -.001 (.002) | -.056 (.019) | .002 (.002) | -.004 (.008) | .009 (.026) |
| Median LSAT $(t-4)$ | .011* (.006) | .008 (.006) | .027* (.014) | .027*** (.008) | .029 (.051) | .055*** (..018) |
| Observations | 937 | 675 | 262 | 937 | 675 | 262 |
| Groups | 102 | 52 | 50 | 102 | 52 | 50 |
| Instruments | - | - | - | 94 | 20 | 22 |
| Hansen test p-value | - | - | - | .428 | .483 | .176 |
| p-value for $H_0$: no autocorrelation in order 2 residuals | - | - | - | .616 | .286 | .343 |
| R-Squared (within) | .726 | .807 | .599 | - | - | - |

Notes:
(1) P-values based on robust standard errors are in parentheses; in fixed effects regressions errors are clustered by school.
(2) *** - statistically significant at 1%; ** - statistically significant at 5%; * - statistically significant at 10%; # - significant at 15%.
(3) All regressions include a dummy variable for each year and a constant.

Table 7A. Effect of USN&WR rank on out-of-state tuition for schools with tuition over $10,000/year (fixed effects and System GMM estimator)

Dependent variable: Logarithm of out-of-state tuition in year $t$

| | Fixed Effects OLS | | | System GMM | | |
|---|---|---|---|---|---|---|
| | All obs. | Top 40 | Rank>40 | All obs. | Top 40 | Rank>40 |
| Log of out-of-state tuition $(t-1)$ | .232**<br>(.117) | .770***<br>(.115) | ..051<br>(.038) | .404***<br>(.145) | 1.14***<br>(.165) | .253<br>(.156) |
| USN&WR rank $(t-2)$ | .0004<br>(.0005) | .0003<br>(.0004) | -.0009*<br>(.0005) | -.0015**<br>(.0006) | -.002<br>(.004) | -.0019**<br>(.0008) |
| Observations | 1369 | 870 | 499 | 1369 | 870 | 499 |
| Groups | 141 | 52 | 89 | 141 | 52 | 89 |
| Instruments | - | - | - | 87 | 22 | 75 |
| Hansen test p-value | - | - | - | .354 | .737 | .980 |
| p-value for $H_0$: no autocorrelation in order 2 residuals | - | - | - | .359 | .953 | .429 |
| R-Squared (within) | .951 | .984 | .934 | - | - | - |

Notes:
(1) P-values based on robust standard errors are in parentheses; in fixed effects regressions errors are clustered by school.
(2) *** - statistically significant at 1%; ** - statistically significant at 5%; * - statistically significant at 10%.
(3) All regressions include time dummies and a constant.

Table 7B. Effect of USN&WR score on out-of-state tuition for schools with tuition over $10,000/year (fixed effects and System GMM estimator)

Dependent variable: Logarithm of out-of-state tuition in year $t$

| | Fixed Effects OLS | | | System GMM | | |
|---|---|---|---|---|---|---|
| | All obs. | Top 40 | Rank>40 | All obs. | Top 40 | Rank>40 |
| Log of out-of-state tuition $(t-1)$ | .233**<br>(.118) | .767***<br>(.115) | .057<br>(.041) | .370***<br>(.132) | 1.03***<br>(.093) | .568***<br>(.041) |
| USN&WR score $(t-2)$ | -.002*<br>(.001) | -.0003<br>(.0006) | .003<br>(.002) | .006***<br>(.002) | -.0007<br>(.0014) | .006***<br>(.002) |
| Observations | 1373 | 871 | 502 | 1373 | 871 | 502 |
| Groups | 141 | 52 | 89 | 141 | 52 | 89 |
| Instruments | - | - | - | 87 | 22 | 78 |
| Hansen test p-value | - | - | - | .117 | .717 | .913 |
| p-value for $H_0$: no autocorrelation in order 2 residuals | - | - | - | .379 | .374 | .372 |
| R-Squared (within) | .951 | .984 | .930 | - | - | - |

Notes:
(1) P-values based on robust standard errors are in parentheses; in fixed effects regressions errors are clustered by school.
(2) *** - statistically significant at 1%; ** - statistically significant at 5%; * - statistically significant at 10%; # - significant at 15%.
(3) All regressions include time dummies and a constant.

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Table 6D. Effect of three year average of USN&WR score and LSAT on starting salary adjusted for employment at graduation (fixed effects OLS and System GMM estimator)

Table 7A. Effect of USN&WR rank on out-of-state tuition for schools with tuition over $10,000/year (fixed effects and System GMM estimator)

Table 7B. Effect of USN&WR score on out-of-state tuition for schools with tuition over $10,000/year (fixed effects and System GMM estimator)

## Appendix

*Proposition*. Let $s(t)$ be the school's score in year $t$ and let $s(t)$ be a linear combination of two components (or factors), $e(t)$ and $i$, where $e(t)$ is an echoing factor and $i$ is a constant. That is,

$$s(t) = \alpha e(t) + (1-\alpha)i \quad (1)$$

where

$$e(t) = e(t-1) + \lambda\big(s(t-1) - e(t-1)\big) = \lambda s(t-1) + (1-\lambda)e(t-1) \quad (2)$$

and $0 < \alpha,\ \lambda < 1$, Then $\lim_{t\to\infty} s(t) = i$.

*Proof*. To prove this Proposition, we will show that $s(t)$ can be represented as a linear combination of $e(1)$ and $i$ where as $t$ increases, the coefficient of $e(1)$ converges to zero and a coefficient of $i$ converges to 1.

Plugging (2) into (1) and using the appropriately modified expression for $s(t-1)$ from (1) we obtain:

$$\begin{aligned} s(t) = \alpha e(t) + (1-\alpha)i &= \alpha[\lambda s(t-1) + (1-\lambda)e(t-1)] + (1-\alpha)i = \\ &\alpha[\lambda(\alpha e(t-1) + (1-\alpha)i) + (1-\lambda)e(t-1)] + (1-\alpha)i = \\ &\alpha(\lambda\alpha + 1 - \lambda)e(t-1) + (1-\alpha)(1+\alpha\lambda)i \quad (3) \end{aligned}$$

The above can be similarly transformed using $e(t-1) = \lambda s(t-2) + (1-\lambda)e(t-2)$:

$$\begin{aligned} s(t) = \alpha(\lambda\alpha + 1 - \lambda)e(t-1) + (1-\alpha)(1+\alpha\lambda)i &= \\ \alpha(\lambda\alpha + 1-\lambda)[\lambda s(t-2) + (1-\lambda)e(t-2)] + (1-\alpha)i &= \\ \alpha(\lambda\alpha + 1-\lambda)[\lambda(\alpha e(t-2) + (1-\alpha)i) + (1-\lambda)e(t-2)] + (1-\alpha)i &= \\ \alpha(\lambda\alpha + 1-\lambda)^2 e(t-2) + (1-\alpha)\big[\alpha\lambda\big(1 + (\lambda\alpha + 1 - \lambda)\big) + 1\big]i & \quad (4) \end{aligned}$$

Assume that a general formula for $s(t)$ as a function of $e(t-k)$ and $i$ is:

$$\left[\alpha\lambda\left(\sum_{j=1}^{k}(\lambda\alpha+1-\lambda)^{j-1}\right)+1\right]$$

$$s(t)=\alpha(\lambda\alpha+1-\lambda)^{k}e(t-k)+(1-\alpha)\left[\alpha\lambda\left(\sum_{j=1}^{k}(\lambda\alpha+1-\lambda)^{j-1}\right)+1\right]i \qquad (5)$$

Clearly, as (4) demonstrates, (5) holds if $k=2$. Let us show now that (5) would hold for $h=k+1$. Again, we use (2) and (1) to obtain:

$$s(t)=\alpha(\lambda\alpha+1-\lambda)^{k}[\lambda s(t-k-1)+(1-\lambda)e(t-k-1)]+$$
$$(1-\alpha)\left[\alpha\lambda\left(\sum_{j=1}^{k}(\lambda\alpha+1-\lambda)^{j-1}\right)+1\right]i=$$
$$\alpha(\lambda\alpha+1-\lambda)^{k}[\lambda(\alpha e(t-k-1)+(1-\alpha)i)+(1-\lambda)e(t-k-1)]+$$
$$(1-\alpha)\left[\alpha\lambda\left(\sum_{j=1}^{k}(\lambda\alpha+1-\lambda)^{j-1}\right)+1\right]i=$$
$$\alpha(\lambda\alpha+1-\lambda)^{k+1}e(t-k-1)+(1-\alpha)\left[\alpha\lambda\left(\sum_{j=1}^{k+1}(\lambda\alpha+1-\lambda)^{j-1}\right)+1\right]i$$

This proves the validity of (5) via mathematical induction. Therefore, setting $k=t-1$,

$$s(t)\;=\;\alpha(\lambda\alpha+1-\lambda)^{t-1}e(1)+(1-\alpha)\left[\alpha\lambda\left(\textstyle\sum_{j=1}^{t-1}(\lambda\alpha+1-\lambda)^{j-1}\right)+1\right]i$$

Clearly, as $t$ increases, the coefficient of $e(1)$ converges to zero, because $(\lambda\alpha+1-\lambda)<1$. The sum in the coefficient of $i$ is a sum of a geometric progression that starts with 1 and has a multiplier $(\lambda\alpha+1-\lambda)<1$. As $t$ increases, this sum converges to

$$\sum_{j=1}^{t-1}(\lambda\alpha+1-\lambda)^{j-1}\rightarrow\frac{1}{1-\lambda\alpha-1+\lambda}=\frac{1}{\lambda(1-\alpha)} \qquad (6)$$

Plugging (6) into the coefficient of $i$, we obtain:

$$(1-\alpha)\left[\alpha\lambda\left(\sum_{j=1}^{t-1}(\lambda\alpha+1-\lambda)^{j-1}\right)+1\right] \rightarrow (1-\alpha)[\frac{\alpha\lambda}{\lambda(1-\alpha)}+1] \ = 1$$

This proves that as $t \rightarrow \infty, s(t) \rightarrow i$. *Q.E.D.*