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The self-fulfilling effects of the business week graduate business school ranking

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ABSTRACT

Previous research in quantifying the effects of the widely popular Business Week graduate business school ranking on its users and stakeholders were not comprehensive in encompassing the programs that are not ranked in the top tier and in examining the different aspects of its influences. This paper adopts a more thorough approach in studying the effects of the changes in rankings on 22 variables related to admission outcomes, student quality, school demography, pricing policies and placement success. While it is not surprising that the Business Week ranking affects people's perception and behavior, the analyses here uncover effects of substantial magnitude on some variables, especially when the ranking of an institution moves across the three different tiers.

Falling ranking may put a school under serious financial distress due to shrinking enrollment and reduction in tuition income. While the school only increases the indirect price discount such as grant and scholarship aid when its ranking drops within the 1st tier, it has to be much more aggressive in attracting additional students from its declining applicant pool through direct tuition cut when it plummets to the 2nd or 3rd tiers. Besides, the resulting entering class is of slightly lower quality, as measured by its mean values of GMAT scores, undergraduate GPA, work experience and pre-MBA salary. Surprisingly, the career prospect of recent graduates is only adversely affected when a program plunges to a lower tier in the rankings; it appears that falling in the rankings within the 1st tier is actually favorable to their career placement. In addition, the cost of a program not being ranked in the media rankings are heavily borne by its recent graduates as their career prospect will be greatly impaired.

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Chapter 1:
Introduction

The Master of Business Administration (henceforth MBA) market has been growing steadily over the years from 3,280 degrees awarded in 1955 to 127,545 degrees granted in 2002 (see Figure 1) [1]; the average annual growth rate is approximately 5.6%. Besides being one of the most popular and fastest growing degrees in America, the MBA industry is highly dynamic and continuously changing because graduate business schools have to keep abreast of the latest development in the vibrant and constantly evolving business world. On the supply side, the number of graduate business schools has increased from 370 in 1974 to more than 800 in 1999[2].

The popularity of and demand for the MBA programs are fueled by the prospect of improved career and earnings. According to Graduate Management Admission Council (GMAC)[3], graduating MBA students averagely earned $61,302 prior to entering the MBA program and expect to earn $86,350 after graduation --- a 41% increase[4]. However, entering a graduate business school is rarely an easy decision due to the high associated cost; an average 2-year MBA student incurs over $122,300 in tuition and lost earnings and accrues a debt of more than $27,600[5]. Thus, selecting the right MBA programs has become a critical task.

Publications that rank MBA programs, which was first introduced in 1980s and since then have mushroomed, claim to assist prospective MBA students in selecting programs and making schools more responsive to the expectations of students and corporations. These media rankings have grown not just in numbers but also importance. For illustration, we can consider Johnson Graduate School of Management (Cornell University) that was not included in the 1987 top business school ranking published by U.S. News & World Report (henceforth USNWR) but was ranked fifth nationally in 1988 by Business Week (henceforth BW). According to the Johnson

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[1] Source: Digest of Education Statistics 2004, Table 278: Earned degrees in business conferred by degree-granting institutions, by level of degree and sex of student: Selected years, 1955-56 to 2002-03

[2] See p. 7, Green & Reingold (1999)

[3] GMAC, which is best known as the provider of Graduate Management Admission Test (GMAT), serves the entire management education community through a variety of products, services and industry initiatives

[4] Source: Global MBA Graduate Survey 2006, p. III-5

[5] See p. 107, Hindo (2002)

School's associate dean, James W. Schmotter, their enrollment increased more than 50 percent in 1989[6]. In addition, Bednowitz (2000) concluded empirically that BW and USNWR business school rankings affect admission outcomes, pricing policies and placement success. Fee, Hadlock and Pierce (2005) showed that if a dean goes from the 75th percentile of performance (an increase in the rankings of two) to the 25th percentile of performance (a drop in the rankings of two), the probability of his or her departure over the two-year turnover period increases from 15.5% to 31.7%.

Corley and Gioia's (2000) confidential interviews with 26 business school insiders (deans, MBA program directors and public relations officers) reveal that "there was uniform agreement that the rankings were a manufactured form of competition". The Association to Advance Collegiate Schools of Business (AACSB)[7] appointed a task force in 2005 to investigate the impact of the rankings on the accredited schools and members. They concluded that "the impact of media rankings on business schools haven't been completely positive" (Duncan et. al., 2005) since schools spend an extraordinary amount of time and resources preparing data for media surveys and many have reallocated resources to activities that can enhance its ranking but have little to do with quality, such as marketing campaigns, luxurious facilities for a small number of MBA students and concierge services for recruiters.

Media rankings receive mixed responses from business schools. While the students of Kellogg School of Management (University of Northwestern) "erupted into cheers when the Kellogg School was named No. 1 and celebrated with a champagne toast" (Abramson, 2004), Wharton School (University of Pennsylvania) and Harvard Business School declined to provide data for The Economist's rankings in 2004 (Meglio, 2005). Besides, the media has precipitated a barrage of criticisms of graduate business education from faculty and deans (see, e.g. DeAngelo, DeAngelo and Zimmerman (2005), Holstein (2005), Ghoshal (2005), Bradshaw (2005), Pfeffer and Fong (2002, 2004), and Zimmerman (2001)).

It appears that even though these rankings may be artificial quality measure, people believe that they are important, and thus, are influenced by them; this is a

[6] Source: Chronicle of Higher Education (1989), p. 10
[7] AACSB is the premier accrediting agency for bachelor's, master's and doctoral degree programs in business administration and accounting

remarkable manifestation of W.I. Thomas'[8] observation that "If men define situations as real, they are real in their consequences". A natural question arises: How significant are these consequences or effects? As mentioned earlier, Bednowitz (2000) quantified the effects of BW and USNWR business school rankings on 14 variables related to admission outcomes, pricing policies and placement success. However, he could not manage to uncover any statistically and economically significant effects on several important variables such as total enrollment, placement rate, average starting salary, tuition level, and pre-MBA salary. Besides, some other interesting variables such as applicant level, full time enrollment, part time enrollment, percentage of foreign students, and so forth were not examined. He also restricted his study to the top institutions only.

The objective of this paper is to build on Bednowitz's (2000) work and investigate the impact of business school rankings more closely with more data by extending the period of study from 10 years (1988-1998) to 16 years (1988-2004) and by incorporating the institutions that are not ranked as top tier. A total of 22 variables related to admission outcomes, student quality, school demography, pricing policies and placement success were examined. This paper also explores the effects on the schools that are not ranked by the media.

The analyses here focus on the BW ranking only because Bednowtiz (2000) found that the effects of the BW and USNWR rankings are similar but the BW ranking tends to have somewhat more statistically significant results. This is reasonable since the BW ranking is the oldest among all existing business school rankings and BW specializes in assessing business schools while USNWR publishes rankings for various fields. Furthermore, the London Times (1999) refers to the BW rankings as "Oscars of American Business Education" and "Bible for prospective students". Corley and Gioia's (2000) confidential interviews with business school insiders also confirm that BW is one of the "most visible and important rankings". Econometrically, the BW data are easier to handle because the BW ranking depends mainly on survey results while other rankings such as the USNWR ranking have inherent endogeneity problem since these rankings are based on the variables under study such as GMAT scores and undergraduate GPA.

[8] William Isaac Thomas was an American sociologist; he is noted for his pioneering work on the sociology of migration and for his formulation of what became known as the Thomas theorem, a fundamental law of sociology: "If men define situations as real, they are real in their consequences".

Chapter 2:
Overview of Graduate Business School Rankings

As mentioned in the previous chapter, there exist other media rankings for MBA programs besides those published by BW and USNWR. This section presents an overview and brief history of graduate business school rankings in America. The most prominent of which are from: BW, USNWR, The Financial Times, Forbes, The Wall Street Journal and Economist Intelligence Unit[9]. Most of the information reported below was obtained from Miller (1988)[10].

Prior to the existence of these media rankings, peer ratings method was used to establish the general reputations of professional schools with a particular group. For example, Brooker and Shinoda (1976) conducted a survey of the department chairmen of colleges and universities holding membership in the AACSB to determine the rankings for five functional areas of graduate study for business. Another popular approach was page count in selected professional publications. For instance, Burch and Henry's (1974) citation analysis was based on an extensive selection of publications related to business education and research.

The first media ranking for graduate business schools was produced by Standard and Poor's (S&P) Compmark division, which ranked schools based on the number of graduates who were top business executives (i.e. presidents, vice presidents and directors). The survey was done in 1976, 1980 1982, 1985 and 1987, which was the last. The top three positions were consistently dominated by Harvard, New York University (NYU) and Columbia.

In 1985, Brecker and Merryman (BM), Inc., a New York consultant in human resource management and communication, surveyed 250 of the largest industrial and service companies to find out how corporate recruiters that employ many MBAs perceive and rate the different graduate business schools. 134 companies responded, ranking Kellogg (Northwestern University) first, Wharton (University of Pennsylvania) second and Harvard third. Another survey performed by Louis Harris & Associates (LHA), Inc., for

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[9] A subsidiary of The Economist and its ranking is published in a book titled "Which MBA?"
[10] See p. 10-14, Miller (1988)

BW magazine in 1985 indicates that Harvard was the best business school, followed by Stanford and Wharton; this ranking was published in 1986.

A survey done in 1987 by Heidrick & Struggles (HS), a national executive recruiting firm, of 220 chief executives of large companies, provides another business school ranking. Harvard was voted first, Stanford second and University of Chicago third. In the same year, USNWR surveyed the deans of nationally recognized business schools as to which were the leading graduate business schools. Of 232 deans surveyed, the magazine received responses from 131. The first three schools ranked as follows: Stanford, Harvard and Wharton.

In 1988, Barron and Economist Intelligence Unit published their own guide to graduate business schools but they did not construct their own ranking and merely reported the rankings prepared by others that are mentioned above. BW, on the other hand, published its first ranking based solely on the poll of recent graduates and corporate recruiters. This ranking gained popularity quickly and prompted BW to publish its first "Guide to the Best Business Schools" in 1990. Since then, BW has been publishing a new edition of this guide every two years. A more detailed discussion about the BW ranking will be provided in the next chapter of this paper.

USNWR adopted a new ranking methodology in 1990 and has been updating its ranking annually. Around the turn of the 20th century, four more media rankings joined BW and USNWR to study and compare the quality of the graduate business schools from different perspectives. The Financial Times introduced its first ranking in 1999, Forbes in 2000, The Wall Street Journal in 2001 and Economist Intelligence Unit in 2002. Figure 2 shows a timeline of the major development in business school rankings.

Due to the proliferation of business school rankings, prospective students have various information sources to help them in the school selection process since each ranking employs different methodologies and approaches; for this same reason, business schools are overwhelmed with data reporting as the information required by each media ranking is not standardized. Table 1 provides a summary of the six most prominent media rankings mentioned in the beginning of this chapter.

Chapter 3:
Business Week Ranking and Its Flaws

BW publishes one of the most influential and prominent rankings for MBA programs. Its ranking is vastly different from those provided by the others because it is primarily based on survey responses from recent graduates and corporate recruiters (even though BW has started to incorporate business schools' reputation for academic research in its ranking since 2000). This section discusses the methodology used by BW and the movements in the rankings over the years. In addition, the reasons why the BW ranking is an imperfect measure of the true quality of business schools are also investigated here.

BW has been conducting surveys of graduates and recruiters every two years since 1988. The results are usually released in October through BW magazine and its website; a complete, updated "Guide to the Best Business Schools" is then published in the following year. However, the first guide was issued in 1990 instead of 1989 and no updated guide has been published since 2004. The methodology of the survey has been modified significantly over the years and the descriptions provided in the following paragraphs reflect the current practice of BW as detailed on its website.

A web-based survey that consists of 50 questions is sent to recent graduates. The questionnaire covers topics such as teaching quality, learning environment, application of technological tools, course integration, job placement efforts, teamwork among classmates, emphasis on analytical skills, leadership training, overall satisfaction with the program and so forth. For each question, the students rate their school on a scale of 1 to 10. The survey results of the current graduating class count for 50% of a school's total student satisfaction score; the results from the prior two bi-annual surveys count for 25% each. Then, David M. Rindskopf and Alan L. Gross, professors of educational psychology at City University of New York Graduate Center, analyze the data to verify the poll's integrity. Once the student poll data are certified, the scores received a 45% weight in the overall ranking. Table 2 reports the survey response rate.

Similarly, corporate MBA recruiters are invited to fill out an online survey. Recruiters are asked to rate their top 20 schools according to the quality of a business school's graduates and their company's past and present experience with its MBA students. Each school's total score is divided by the number of responding companies that recruits from the school. The survey results from the previous two rankings are incorporated in a similar fashion to that of the student survey. The three recruiter polls account for 45% of the final ranking. Table 2 reports the survey response rate.

Finally, BW calculated each school's intellectual capital rating by tallying faculty members' academic journal entries in 20 publications such as the Journal of Accounting Research and the Harvard Business Review. BW also searches The New York Times, The Wall Street Journal and Business Week, and adds points to a school if its professor's book was reviewed there. The scores are then adjusted for faculty size. The final intellectual capital score accounts for 10% of a school's final grade. Based on the final grades, schools are categorized into three tiers and only those in the top tier are given a numerical rank between 1 and 30. After 1994, the schools in the third tier are no longer listed in the guide but are reported on the BW website.

A total of 67 business schools have been surveyed and reported since 1988. See Table 3 for a brief summary of these schools. Some of these schools do not appear in every bi-annual ranking and the top tier positions have been expanded from top 20 in 1988 to top 30 in 2002. Table 4 shows the historical rankings of each school from 1988 to 2004. Figure 3 provides an alternative view to the year-to-year ranking changes for the top tier schools. From this figure, it appears that most changes are small (between -3 and +3) except for a few outliers. Interestingly, there were more schools staying constant in their rankings in 1998, 2000 and 2004 compared to the other years. Figure 4 confirms that about 70% of the changes are indeed within -3 and +3. Notice that the histogram is rather normal. For an illustration of the inter-tier changes, refer to Table 5. Since the inception of the BW ranking, there has only been one school that jumped from the third tier into the first tier: Georgia Tech College of Management was in the third tier in 1998 and ranked 30th in 2000 after BW expanded its top tier positions from top 25 to top 30. The most significant impact on this school was its yield rate which rose to 60% from a percentage normally in the lower 50s.

From Corley and Gioia’s (2000) confidential interviews with business school insiders, it seems that the rankings are not perceived to be “a bona fide representation of the quality of a business school" but "an artificial reputation measure". Tracy and Waldfogel (1994) proposed a reasonable standard for a ranking procedure: "Ranking should be based on measurable criteria that are comparable across programs." The BW ranking totally violates this principle. The questions posed in the graduate survey are usually dependent on highly individualized criteria. For example, the 1998 survey included the following questions: "Do you believe your MBA was worth its total cost in time, tuition and lost earnings?" and "Overall, how did the quality of teachers compare with others you have had in the past?". The responses to these questions are highly subjective depending on one's expectations and past experience. Furthermore, each student normally only attends one MBA program, and thus, does not have any objective benchmark for his or her responses. Consequently, the BW graduate scores across institutions do not necessarily reflect any differences in the programs themselves. Comparison of the rankings from year to year is also not meaningful because the structure of the ranking procedure has been changing in terms of the number of questions in the survey (see Table 2) and the predetermined weights. The recruiter survey suffers similar problems.

It is not until recently that the weight on each component of the BW ranking has become so transparent. Prior to 2000, it was not clear how BW combined the graduate and recruiter surveys in producing the final ranking, which was not a simple average but based on "a statistical technique" that "reflects the relative performance of the schools in each poll"[11]. No detail about this statistical technique was reported; lacking of transparency in this regard adds significantly to the arbitrary nature of the end results. The use of predetermined weights casts another question: How are they established? The weights assigned are highly arbitrary and they are not decided upon by the ranking users and stakeholders, which consist of current and prospective students, recruiters, alumni, school administrations, faculty and donors.

Besides, unlike opinion pollsters that report the accuracy of their polls, BW never disclose the statistical noise problem with its rankings, as criticized by DeAngelo, DeAngelo and Zimmerman (2005). Moreover, if the media surveys capture meaningful changes in program quality, one should observe a statistically detectable correlation among ranking changes. Yet studies have found no such correlation between the

[11] See p. 78-79, Byrne (1988)

ratings changes of BW and USNWR (Dichev (1999), Fee, Hadlock and Pierce (2005)). This suggests that the rankings might probably be more statistical noise than true quality measure.

While BW has been trying to improve its ranking methodology and poll's integrity over the years, there are still flaws inherent in the procedure, which are common among other rankings. Being the major "consumers" of MBA programs, graduates and recruiters are probably the best sources for insider information but it is unbelievable that they can provide unbiased responses that are useful for comparing different programs objectively. An overview of the movements in the rankings over the years was given in this section and further expositions of other data used in the analysis of this paper will be presented in the next chapter.

Chapter 4:
Data Descriptions

Various data related to selectivity, program's popularity, student quality, school demography, cost of program, and career placement were used in the study of this paper. The data used in the analysis presented in Chapter 6 were originated from BW publications only while those in Chapter 7 were also obtained from other media sources.

The eight editions of the BW rankings guide, "Business Week Guide to Best Business Schools", contain numerous detailed data for the 67 schools ranked. The BW website[12] is the primary source of data for the 2004 ranking since the ninth edition of the guide was not published. All the data for the 3rd tier schools from 1996 to 2002 were derived from this website because they were not included in the guides. The BW magazines dated March 24, 1985 and November 28, 1988 provides the business school data of 1985 and 1988 respectively. In addition, Barron's "Guide to Graduate Business School" published in 1988 contains the data of 1987 and Economist Intelligence Unit's "Which MBA?" published in 1990 includes the data of 1989. The data prior to 1988 was primarily used in the analysis in Chapter 7 while the data after 1988 was employed in the study in Chapter 6.

Table 6 shows a summary of the variables used in the analysis. Notice that the values of *meanpay*, *tuition*, *prepay* and *loans* are adjusted to the 1988 dollar so that the effects on them in real terms can be studied. Data for some variables do not exist for every year; a summary of the availability of these data is presented in Table 7. Since the data of different variables tend to move together over the years, Table 8 displays the correlation table for all the variables listed in Table 6. The variables *rank* and *applicant* are most highly negatively correlated with a correlation coefficient of -0.85[13] whereas one of the most highly positively correlated variables are *applicant* and *meanpay* (even though *rank* and *recrank* are more highly positively correlated but they are not as interesting since rank is derived from *recrank* through the BW ranking procedure; similarly for *enroll* and *parttime*). These observations are not surprising because prospective students are attracted to the more highly ranked schools and also to the

[12] http://www.businessweek.com/bschools/
[13] Since 1 is better than 10, a drop in the rankings means an increase in the numerical value of *rank*

schools that offer higher expected salary upon graduation.

For the summary statistics of all the data series mentioned, refer to the box plots in Figure 5. Interestingly, while *meanpay* has been fluctuating over the years in real terms, *tuition* has been rising in real terms with an average bi-annual growth rate of 6.6%. Besides, *meanpay*, *jobs* and *offers* took a noticeable drop in 2002 after the 9/11 terrorist attack that led to the slowdown in the economy. From Figure 5, it seems that business schools have become more and more diverse as the percent of foreign students has almost doubled over the 12-year period from 1988 to 2000. Business schools also appear to have been more attractive to the more senior working adults since both *age* and *workexp* have been trending upward. Surprisingly, overall enrollment in full time, part time, distance and executive MBA programs for the schools ranked by the BW has been staying roughly constant over the years from 1988 to 2004 despite that the master degrees in business granted by all the schools in the U.S. have been increasing steadily as shown in Figure 1. Another interesting observation is that, unlike *gpa*, *gmat* has been rising with an average bi-annual growth rate of 1.1%. This is probably due to the abundance of GMAT preparatory programs that have mushroomed over the years.

Finally, a panel data of 67 schools for nine years with 509 unique observations was assembled for the study in Chapter 6. The analyses in Chapter 7 involve different data structures and will be discussed in detail later on.

Chapter 5:
Models and Methods

While BW asserts that its ranking reflects the true quality of business schools, some believe that the changes in the rankings are merely statistical noise inherent in the ranking procedure as explained in Chapter 3. However, it is generally agreed that ranking imposes a self-fulfilling effect on business schools in the sense that resources flow to schools which are highly ranked. As stated precisely by Corley and Gioia (2000), "if a school drops precipitously in the rankings, the proximal effects are that quality students no longer apply for admission, prestigious companies no longer recruit from the school, and external funding becomes harder to obtain, thus leading to the distal effects that the school admits lower-quality students, soon experiences less successful placements and attracts fewer resources for creating new programs". The econometric models employed in the analysis of this paper are based on this intuition.

The model used here is similar to those developed by Bednowitz (2000) and Ehrenberg and Monks (1999). This paper hypothesizes that the ranking users of current period refer to the ranking published in the previous period when making relevant decisions. For instance, the entering class of 2000 would have made use of the ranking published in 1998 in selecting schools. Thus, the ranking from the year before each guide is published affects the statistics released in each guide. Specifically, the following statistical relationship was studied and reported in the next chapter:

$$X_{i,t} = \beta_0 + \beta_1 X_{i,t-1} + \beta_2 \, rank_{i,t-1} + \beta_3 \, dum2nd_{i,t-1} + \beta_4 \, dum3rd_{i,t-1} + \text{institutional dummies}_i + \text{year dummies}_t + \varepsilon_{i,t} \qquad (1)$$

where X_t represents the variables listed in Table 6

Fixed effects estimation method was employed to analyze the panel data discussed in the previous chapter. More accurately, the dummy variable regression method was used as it is evident from specification (1) above. To manage the scaling issue with certain variables namely *applicant*, *enroll*, *loans*, *meanpay*, *parttime*, *prepay*, and *tuition*, the following functional form was adopted when studying these variables:

$$\log(X_{i,t}) = \beta_0 + \beta_1 \log(X_{i,t-1}) + \beta_2 \, rank_{i,t-1} + \beta_3 \, dum2nd_{i,t-1} + \beta_4 \, dum3rd_{i,t-1} + \text{institutional dummies}_i + \text{year dummies}_t + \varepsilon_{i,t} \qquad (2)$$

These models and methods are appropriate since they are effective in handling the problem of time-constant omitted variables. The binary dummy variables control for yearly effects and also effects attributable to the nature of each institution. The lagged dependent variable acts as a proxy for the historical factors that cause current differences in the dependent variable. Considering the variable *meanpay*, it is certain that many other factors, such as the prevailing condition of the labor market and the type of companies typically recruiting at a particular school, affects the average starting salary of that school's graduates; unbiased and consistent estimates for the coefficients can still be obtained even though these factors are not explicitly included in the model because the time-fixed effects absorb the effects of labor market changes that are common to all schools.

Besides, the dummy variables *dum2nd* and *dum3rd* are included to capture the results of inter-tier movement in the rankings. As mentioned in Table 6, the ranking for the schools in the 2nd and 3rd tiers are given the value of the last position of the 1st tier for the years they are ranked. For example, the 2nd and 3rd tiers schools in 1988 are given a value of 20 since BW listed top 20 schools in the 1st tier. Consider a school that was ranked in the 2nd tier in 1988. The equation for that school is:

$$\log(X_{i,t}) = \beta_0 + \beta_1 \log(X_{i,t-1}) + \beta_2 * 20 + \beta_3 + \text{institutional dummies}_i + \text{year dummies}_t + \varepsilon_{i,t} \quad (3)$$

So, the effective rank of a 2nd tier school in 1988 is: $20*\beta_2 + \beta_3$. In other words, the regression treats the rank of all 2nd tier schools the same. Similarly, the equation for a 3rd tier school is:

$$\log(X_{i,t}) = \beta_0 + \beta_1 \log(X_{i,t-1}) + \beta_2 * 20 + \beta_4 + \text{institutional dummies}_i + \text{year dummies}_t + \varepsilon_{i,t} \quad (4)$$

Thus, it is clear that the coefficient on these two dummy variables indicate whether an institution that falls out of the 1st tier experiences changes in admission outcomes, student quality, school demography, pricing policies and placement success that are significantly different from the school ranked last in the 1st tier.

The models and methods here only apply to the study in Chapter 6 since those used in the analyses presented in Chapter 7 are different due to the different data structure involved and will be discussed in detail later on.

Chapter 6:
Results

Using the models and methods discussed in the previous chapter, 22 variables related to admission outcomes, student quality, school demography, pricing policies and placement success were analyzed carefully to quantify the self-fulfilling effects of the BW ranking on the ranking users and stakeholders. Table 9 to 13 presents the results of the analyses and the original regression outputs can be found in the appendix of this paper. The results will be discussed in the order of the category listed above. To obtain a sense of the significance of the effects in terms of magnitude, refer to Figure 5 when interpreting the results explained below. It should be noted here that the effects reported on the variables with dollar unit are in real terms.

Admission Outcomes

The first column of Table 9 demonstrates that a single-position drop in the ranking of a program results in a statistically significant increase of 0.388% in that program's acceptance rate (i.e. *accept*). The average acceptance rate for the institutions in the sample for the 16 years measured is 33.6%. So, the increase is approximately 1.2% of the sample mean. This effect may be considered as substantial especially for the top rank schools since they usually have low acceptance rate. For instance, if Stanford fell in its ranking by one spot in 1998, its acceptance rate would increase from 7% to about 7.4%. On the other hand, if Owen Graduate School of Management (Vanderbilt University) dropped in its ranking by one spot in 2004, its acceptance rate would increase from 68% to 68.4%, which is much less noticeable compared to that of Stanford. Interestingly, there is no difference between being ranked last in the 1st tier and falling to the 2nd and 3rd tiers in terms of the change in acceptance rate.

It is important to realize that acceptance rate comprises two components: total number of applicants (i.e. *applicant*) and the number of applicants who are admitted (i.e. *accept*applicant*). The third column of Table 9 shows that a one-slot decline in ranking decreases the size of the applicant pool of a program by 2.1%. The average number of applicants for the sample is 1830; 2.1% of this number is about 40 applicants. While descending from the 1st tier to the 2nd tier does not have any effect on the applicant level, plummeting to the 3rd tier can pose a serious problem to a program because the school can lose 26.2% of its applicants. The fourth column is the analysis for the other component of acceptance rate. This result is crucial to understand if the increase in acceptance rate as the ranking falls is due to the change in the numerator, namely the number of applicants who are admitted, or that in the denominator, which is the total number of applicants, or both. The result shows that a drop of one place in ranking induces a school to accept 1.1% less applicants. Besides shrinking applicant pool, this observation is also probably due to the decrease in the quality of applicants as studied in the next section of this chapter. It appears that a school whose ranking falls does not attempt to admit a larger number of applicants even though facing the prospect of lower propensity of students to enroll in the program. After disentangling the effects of falling ranking on the two components, it is clear that the increase in acceptance rate is due to the fact that the decrease in the total number of applicants (i.e. denominator) is greater than that in the number of applicants who are admitted (i.e. numerator). Besides, the consequences of dropping from the 1st tier to the 2nd and 3rd tiers are 14.2% and 23.0% declines in the number of applicants admitted respectively. However, the statistical evidence for the former is weaker than the latter.

The last column of Table 9 attempts to dissect the two components of yield rate (i.e. *yield*): the number of applicants admitted who enroll (i.e. numerator) and the number of applicants who are admitted (i.e. denominator). It is natural to assume that as a program is ranked lower, the applicants who are admitted have less inclination to enroll in that program given that they have other better alternative. Surprisingly, the result from the second column does not support this postulation since no statistically significant effect was discovered on the yield rate. However, a closer look at the results from the last two columns explains this finding. A one-slot drop in ranking induces 1.1% less applicants who are admitted to enroll in the program (i.e. *accept*yield*applicant*); this is exactly the magnitude of the effect on the number of applicants who are admitted (i.e. *accept*applicant*). Since the numerator and denominator change by about the same amount as the ranking falls, it is apparent that the net effect on the yield rate is close to zero. In addition, plummeting from the 1st tier to the 2nd and 3rd tiers causes 11.8% and 16.3% decreases in the number of applicants admitted who enroll respectively.

While the movement between the 1st and 3rd tiers is almost nonexistent as shown in Table 5, the effects of the inter-tier movements between the 2nd and 3rd tiers, which occurs more often, can be deduced by taking the difference between the coefficients of *dum2nd* and *dum3rd*. For instance, if a program plunges from the 2nd tier to the 3rd tier, the number of applicants admitted would decreases by 8.8% whereas the number of applicants admitted who enroll drops by 4.5%.

In conclusion, the changes in rankings can have a significant impact on the perception of prospective students towards the prestige and quality of a program especially when it slips to the 2nd and 3rd tiers; fewer student will apply to that program and admitted applicants will have less tendency to enroll. Contrary to the popular belief that a school tends to accept more applicants when its ranking falls, the school probably does not lower its admission standard by a great magnitude, and thus, accepts fewer applicants since the quality of the applicant pool drops only slightly as it is evident in the analyses presented below.

Student Quality

As mentioned in the previous section of this chapter, one potential explanation to the decrease in the number of applicants admitted is the decline in the quality of applicants. This observation is reflected in the results displayed in Table 10. While the GMAT scores, undergraduate GPA and work experience are the typical indicators of student quality, the salaries students earn before deciding to go back to school is a crucial measure of quality too. The larger the salary, the more likely it is that the candidate left a meaningful job in a demanding environment.

There is very strong statistical evidence indicating that as an institution falls in its ranking, the average GMAT scores (i.e. *gmat*) of its entering class decline by 0.790 for every single-place drop. Reasonably strong statistical significance was also found for the effect of the changes in rankings on the average undergraduate GPA (i.e. *gpa*), which decreases by 0.005 per single-slot drop. The average GMAT score for the sample is 634 while the average GPA is 3.27. From Figure 4, most changes in the rankings are small, and in fact, approximately 70% of the changes are within -3 and +3 as discussed in Chapter 3. Thus, the effect on the average GPA is not economically significant. The effect on the average GMAT scores must be examined more carefully.

Figure 5 shows that the average GMAT scores of the sample have been trending upward consistently at a bi-annual growth rate of 1.1%. Hence, the decline in a program's average GMAT score is much more significant in the relative sense when comparing with the other schools. In addition, falling from the 1st tier to the 2nd and 3rd tiers does not have any statistically significant impact on the average GMAT scores and GPA.

Unlike the two variables described in the paragraph above, the average pre-MBA salary and work experience behave more interestingly when a school drops from the 1st tier to the 2nd and 3rd tiers even though there is no strong statistical evidence showing that these two variables are affected by the movements in rankings within the 1st tier. The third column of Table 10 demonstrates that a single-position drop in the ranking of a program results in a weakly statistically significant decrease of 0.4% in the average pre-MBA salary (i.e. *prepay*). The average pre-MBA salary for the sample is around $50,000 in 2005 dollar; 0.4% of this amount is approximately $200. Surprisingly, as an institution drops from the 1st tier to the 2nd tier, its average pre-MBA salary rises by 2.7%; benchmarking on the sample mean, this percentage is about $1,400. This is absolutely counterintuitive as students are willing to give up a higher salary for a program that slips to the 2nd tier. As for the average work experience (i.e. *workexp*), the consequences of plummeting from the 1st tier to the 2nd and 3rd tiers are a decline of 0.279 and 0.252 years respectively as shown in the last column of Table 10. The average work experience for the sample is around 4.4 years; those declines represent 6.3% and 5.6% of the sample mean correspondingly. Unexpectedly, dropping from the 2nd tier to the 3rd tier causes a slight increase of 0.027 year in the average work experience. It is difficult to judge the economic significance of these results since we are using the average pre-MBA salary and work experience as indirect measures of student quality.

All in all, the effects of rankings on the variables related to student quality are generally small.

School Demography

The first three columns of Table 11 display the results for the effects of the changes in rankings on an institution's total enrollment (i.e. *enroll*), total full-time enrollment (i.e. *enroll-parttime*) and total part-time enrollment (i.e. *parttime*). Refer to

Table 6 for the exact definitions of these variables. The first column shows that the movements in rankings within the 1st tier do not cause any changes on the total enrollment; this contradicts the study in the beginning of this chapter indicating that the total number of applicants admitted who enroll decreases as a program drops in its ranking. However, the second and third columns dismiss this contradiction by examining the full-time enrollment and part-time enrollment separately. It appears that part-time students are not responsive to the changes in rankings within the 1st tier but a single-position drop in ranking results in a statistically significant decrease of 1.2% in the full-time enrollment. If a program plummets from the 1st tier to the 2nd tier, its part-time enrollment would decrease by 16.5%. Even though there is no statistically significant result discovered for the inter-tier movement between the 3rd tier and the other two tiers, we can still postulate that part-time students probably do not concern too much about how high or low a program is ranked as long as it is considered as one of the top schools in the 1st tier but they may find the program that falls out of the 1st tier as unworthy for their investment. Unlike part-time students, full-time students pay understandably more attention to the changes in rankings since they have to give up their jobs in order to pursue their MBA degrees. The consequences of dropping from the 1st tier to the 2nd and 3rd tiers are 5.4% and 7.6% declines in total full-time enrollment respectively; it can be deduced that falling from the 2nd tier to the 3rd tier causes the full-time enrollment to go down by 2.2%. It should be noted that the statistical evidence for *dum3rd* in this case is rather weak. As for the total enrollment with a sample mean of 790 students, if a school drops by one tier, either from the 1st to the 2nd or from the 2nd to the 3rd, it would lose as much as 5.4% of its total enrollment, which is around 43 students. To illustrate the economic implication of these changes, we can consider Marshall School of Business (University of Southern California) with a total enrollment of 1391 students, of which 599 are full-time students, and a ranking of 27th place in 2004. If it plummets to the 2nd tier, the total full-time enrollment would decrease by 32 students. Since each non-resident student pays $34,692 per year in 2004, Marshall School of Business may lose $1.1 million dollars in tuition income and this does not include the similar loss associated with the decrease in part-time enrollment; such income loss may create serious financial distress for this school.

The fourth column of Table 11 exhibits the effects on the average age (i.e. *age*) of the student population, which is similar to that on the average work experience (i.e.

workexp) since they are highly positively correlated as shown in Table 8. The last three columns of Table 11 (which is listed on a separate page from the first four columns) show the effects of the changes in rankings on the percent of international students (i.e. *foreign*), the percent of minority (i.e. *minority*) and the percent of female (i.e. *women*) in the student population of a program. Interestingly, a one-slot decline in ranking increases the presence of international community by 0.233% but the coefficients of *dum2nd* and *dum3rd* are not statistically significant. Foreign students may think that it is easier to obtain admission to a school with a lower ranking, and thus, are more inclined to apply for it. While none of the coefficients for the percent of minority is statistically significant, a drop of one place in ranking reduces the percent of female students by 0.256%. Surprisingly, if a program drops to the 2^{nd} and 3^{rd} tiers, the percents of female students would rise by 1.66% and 1.25% respectively. It should be noted that the statistical evidence for the latter is rather weak.

In conclusion, the school demography of a program is influenced by the changes in rankings. Full-time enrollment, the percent of foreign students and the percent of female students response to the changes within the 1^{st} tier. Total enrollment, full-time enrollment, average age and the percent of female students response to all inter-tier movements in rankings while part-time enrollment only react to those involves the 2^{nd} tier. On the other hand, the percent of international students and the percent of minority are not influenced by any inter-tier changes.

Pricing Policies

Table 12 reports the relationship between the BW ranking and the two indicators of pricing policies for an MBA program, namely the annual tuition fee for a non-resident, full-time student (i.e. *tuition*) and the average loan outstanding per student at graduation (i.e. *loans*). Bednowitz (2000) and Ehrenberg and Monks (1999) suggested that "schools do not visibly change their tuition, but vary the percentage of self-help and grant aid offered to incoming students in response to changes in rankings". The study here concurs with this hypothesis.

While the tuition level does not change as a program falls in its ranking within the 1^{st} tier, the average loan outstanding per student decreases by 0.9% per single-slot drop. This suggests that institutions offer a price discount through a greater level of grant and scholarship aid in order to attract higher quality students from its shrinking applicant pool. The sample mean of the average loan outstanding per student is $37,000 in 2005 dollar and 0.9% of this is approximately $330. Both tuition and loan level would be reduced if a program falls from a higher tier to a lower tier. Plunging from the 1st tier to the 2nd tier causes 4.3% and 12.2% reductions in tuition and loan level respectively while plummeting from the 2nd tier to the 3rd tier decreases them by 2.7% and 22.6% correspondingly. It seems a school that drops out of the 1st tier has to be more aggressive in providing incentives to increase its appeal to prospective students. However, it should be noted that the coefficient of *dum2nd* for the loan level does not have strong statistical evidence. Since the reduction in loan level may be due to the decrease in tuition expenses, we can further our investigation by examining the average annual tuition for a non-resident, full-time student and the average loan outstanding per student for the schools in the sample in 2004; they were about $29,100 per year and $44,000 respectively. We can consider the case when a program falls from the 1st tier to the 2nd tier, for which 4.3% of $29,100 per year for two years is around $2,500 while 12.2% of $44,000 is about $5,400. Since the dollar amount reduced in loan level is more than twice of that in tuition fees, it suggests that an institution that is no longer considered as top tier school has to offer not just an indirect price discount through grant and scholarship aid but also a direct price cut by reducing its tuition charges.

Combining the observations here with those from the previous section of this chapter which demonstrates that falling ranking reduces the total enrollment of a program, we can see that the financial status of a program is not only strained by the shrinking enrollment but also the accompanying tuition cut and price discount. This may create the kind of snowball effect proposed by Corley and Gioia (2000) since that program would have less resource to compete with other schools, and thus, may lead to further decrease in its ranking and eventually its true quality.

Placement Success

Career prospect upon graduation is obviously one of the most crucial criteria for prospective students when evaluating the quality of a program as this is usually what attracts them to pursuing an MBA degree in the first place. Although Bednowitz (2000) could not manage to uncover any results related to placement success, the analyses here found numerous statistically significant effects of the changes in rankings on the average starting salary of recent graduates excluding bonuses (i.e. *meanpay*), the change in salary (i.e. *meanpay-prepay*), the percent of graduates who receive job offers within three months after graduation (i.e. *jobs*) and the average number of job offers received per student (i.e. *offers*).

As mentioned in the beginning of Chapter 5, when a program is ranked highly, one would assume that its students have better chance in getting employment upon graduation and also receiving more job offers; one would also think that prestigious companies may be more inclined to hire at a school with higher ranking, and thus, giving its students a better chance in landing on high-paying jobs. Interestingly, while the effects of the changes in rankings within the 1st tier refute this conjecture, the consequences of dropping out of the 1st tier mostly support it. Refer to Table 13 for the relevant results.

Contrary to the students' worry that their career prospect would be adversely affected as their school drops in its ranking within the 1st tier, it appears that a single-position drop in the ranking results in statistically significant increases of 0.9% in the average starting pay upon graduation, 2.2% in the change in salary and 0.383% in the placement rate. Controlling for the quality of the students by their work experience as displayed in the second column, the effect on the average starting pay is an increase of 0.5% for every single-slot drop. Similar control was used for other variables but the coefficients of *workexp* turned out to be statistically insignificant. Other measure of student quality such as GMAT scores, undergraduate GPA and pre-MBA salary were also tested for their roles as control but they did not yield any statistically significant coefficients. In addition, the average number of job offers per student also surprisingly increases by 0.456 as a school plummets from the 1st tier to the 2nd tier. All these results are very puzzling.

However, as a school drops out of the 1st tier, the consequences are totally different. From the first column, the results of plunging from the 1st tier to the 2nd tier and from the 2nd tier to the 3rd tier are 3.9% and 2.0% reduction respectively in the average starting salary of recent graduates. The coefficient of *dum2nd* is still statistically significant even after controlling for the student quality. To get a sense of the magnitude of these changes, we can benchmark them on the average starting salary of recent MBA graduates in 2006, which is $86,350 as mentioned in Chapter 1; 3.9% and 2.0% of this number are approximately $3,400 and $1,700. If a program falls from the 1st tier to the 2nd tier, the third column tells us that its graduates would suffer a 13.3% reduction in their salary change; this would definitely reduce the attractiveness of a program to prospective students. However, the coefficients of *dum3rd* do not turn out to be statistically significant for the change in salary, the placement rate and the average number of job offers per student of recent graduates.

All in all, students may not object to the fall in rankings within the 1st tier but they would prefer their schools to be ranked higher to avoid plummeting to the 2nd tier, which could bring about a substantial negative impact on their career prospect.

Some Caveats

It should be pointed out that the issue of BW expanding its 1st tier ranking to top 25 in 1996 and top 30 in 2000 was not completely resolved since a program that were in the 2nd tier in 1994 could have been ranked 25th and included in the 1st tier instead if BW had expanded the number of top positions one edition earlier. Similar regressions were run by capping the rankings in the 1st tier at 20 and adding a dummy variable to capture the effects of being ranked in the expanded 1st tier positions. However, less statistically significant results were found using this method because the explanatory power of the movements within the expanded 1st tier rankings was not captured effectively. Thus, the uncapped rankings were adopted in the analyses of this chapter instead with the intuition that this would capture the effects of the rankings on the perception of people much more effectively and thoroughly. In addition, the sample selection bias was not addressed here but the use of a larger set of schools may help reduce the severity of this problem. Another limitation of the study specifically on placement success is the lack of control to adjust the salary, job offers and placement rates by geographical region, occupation and industry as it was done by Tracy and Waldfogel (1994). But the relevant data was not available for this purpose. Besides, the control for student quality used in the study related to placement success, namely average work experience, is not exogeneous, and thus, calls for the use of instrumental variable to solve this endogeneity problem.

Chapter 7:
Unranked Schools

While the analyses in Chapter 6 reveal various effects of the rankings on the programs that are ranked, the consequences of not being included in the rankings are unknown. By examining the data at the inception of the BW ranking, this study discovered that the career prospect of the students from the unranked schools are adversely affected to the extent of being worse than falling from the 1st tier to the 2nd and 3rd tiers.

The data of the programs that are not ranked by the media are usually not readily available. But we can use the 2nd and 3rd tiers schools of the first BW ranking published in 1988 as a control group for the unranked schools. Supposedly, the data that came with the first ranking should reflect the conditions before the BW ranking starts affecting people's perception. However, upon closer examination of the data published in the first guide which is released in 1990, almost two years after the ranking first appeared in the BW magazine article dated on November 28, 1988, it seems that the data for all the variables reported in the guide were collected in 1989 except the average starting salary that was collected in 1988. Refer to Figure 2 for a better picture of the timeline of the ranking publications. Since the 2nd and 3rd tiers schools were not reported in the magazine article in 1988 and only appeared in the first guide published in 1990, this group of institutions effectively represents the unranked schools. Thus, by studying the before-and-after effects of the schools that are ranked and "unranked" in 1988, this paper found that the average starting salary of recent graduates (i.e. *meanpay*) could drop as much as 13.4% if their school was not listed as one of the 1st tier schools in the BW magazine article published in 1988. A similar study was performed for the percent of graduates who receive job offers within three months after graduation using the USNWR ranking published in 1987. The data was obtained from the Barron's "Guide to Graduate Business School" published in 1988. If a school was not included in the USNWR ranking in 1987, its placement rate (i.e. *jobs*) would decrease by 10.5%. The regression outputs are reported below[14]:

[14] The figures in parentheses are the estimated standard errors while SE is the estimated standard deviation of the disturbance term, DW is the Durbin-Watson statistics, O is the number of observations

$$\log(meanpay_{1990}) = \underset{(1.06)}{1.05} + \underset{(0.099)}{0.906} \log(meanpay_{1988}) + \underset{(0.002)}{0.005}\, bw\_rank_{1988}$$

$$- \underset{(0.040)}{0.134}\, bw\_no\_rank_{1988} + \varepsilon \qquad (5)$$

$R^2 = 0.92$ SE = 0.073 DW = 2.03 O = 40

$$jobs_{1988} = \underset{(27.5)}{31.0} + \underset{(0.282)}{0.580}\, jobs_{1987} + \underset{(0.455)}{0.177}\, usnwr\_rank_{1987}$$

$$- \underset{(5.75)}{10.5}\, usnwr\_no\_rank_{1987} + \varepsilon \qquad (6)$$

$R^2 = 0.28$ SE = 11.6 DW = 1.42 O = 40

The two dummy variables, $bw\_no\_rank_{1988}$ and $usnwr\_no\_rank_{1987}$, are 1 if a school was not ranked in those rankings and 0 otherwise. The estimates of the coefficients for these two dummy variables are statistically different from the estimates of the coefficients of *dum2nd* and *dum3rd* for the same variables studied in Chapter 6 at the 5% significance level. No other variable was investigated due to limited data availability.

In conclusion, the recent graduates of the unranked schools suffered a rather miserable career placement. It seems the media rankings did a great disservice to the students from the schools that were not ranked by these media.

Chapter 8:
Conclusions

This paper examined the effects of the BW ranking on admission outcomes, student quality, school demography, pricing policies and placement success. Since the BW ranking is one of the most prominent media rankings, it is not surprising that various ranking users and stakeholders are influenced by its edition-to-edition changes. From 1988 to 2004, approximately 70% of the changes within the 1st tier are between -3 and +3 ranks while inter-tier changes constitutes about 20% of the changes for all tiers. All of the 22 variables analyzed show statistically significant results and the magnitudes of the effects on these variables are especially substantial when a school moves between the different tiers.

From the analyses, the reasons why institutions pay so much attention to the BW ranking are apparent. If a program falls in its ranking, it would face with the problem of shrinking applicant pool with lower student quality. While the drop in quality may not be noticeable immediately, the reduction in the size of enrollment and tuition income due to the decrease in the tendency to apply and enroll can pose a serious financial threat to that program. The schools react to the changes in their rankings by altering the cost of attending their MBA programs through tuition cut and indirect price discount such as grant and scholarship aid; this reaction may exacerbate the financial distress that is caused by their shrinking enrollments.

Students mostly join an MBA program with the prospect of improved career and earnings upon graduation. Thus, it is understandable that they are sensitive to the changes in the BW ranking since their placement success is affected by the artificial reputation portrayed by the ranking. However, from the study of this paper, the career placement of recent graduates is only adversely affected when a program plummets to a lower tier in the rankings. It appears that falling in the rankings within the 1st tier is actually favorable to their career placement; this finding is very puzzling.

The effects of being excluded from the media rankings were also studied for the institutions which were not ranked in the 1987 USNWR ranking and 1988 BW ranking. The average starting salary of recent graduates could drop as much as 13.4% and the fraction of students who receive job offers within 3 months after graduation may decrease by 10.5%. It seems the media rankings did a great disservice to the students from the schools that were not ranked by these media since the students suffered a rather miserable career placement.

Since the BW ranking is so influential in various aspects, it is not hard to imagine that schools would do every thing they can to enhance their rankings. In fact, AACSB's ranking task force claimed that schools spend an extraordinary amount of time and resources preparing data for media surveys, and many have reallocated resources to activities that can enhance its ranking but have little to do with quality, such as marketing campaigns, luxurious facilities for a small number of MBA students and concierge services for recruiters (Duncan et. al., 2005). Corley and Gioia's (2000) confidential interviews with business school insiders also reveal that schools attempt to "play the ranking game" by "creatively interpreting" the reporting criteria that produce the media rankings. For instance, "schools may put some incoming students (especially international students) into a special 'pre-admission class' so their numbers would not count towards the final tabulations reported for the autumn MBA entering class". Such selective reporting and attempts to spin the meaning of number were "common and accepted practices". Zimmerman (2001) even went as far as asserting that the "ratings race has caused schools to divert resources from investment in knowledge creation, including doctoral education and research, to short-term strategies aimed at improving rankings". This, he claimed, could damage the very foundation of the preeminence of American business education.

In conducted the current analyses, a number of areas for potentially productive further research have presented themselves:

- A model that explain the changes in rankings can be investigated. It is plausible that the enrollment size, endowment capacity, establishment of executive MBA programs and amount of money spent on marketing have a significant impact on future rankings of an institution.
- The proliferation of media rankings provides various opportunities for interesting research projects. A study of which ranking is better at explaining the behavior of ranking users and stakeholders can be performed for the six most prominent media rankings listed in Chapter 2.

The Forbes ranking could possibly be the most influential among prospective students since it focuses entirely on earnings, which is often the most important criteria for them when selecting schools.

- The correlation study among various rankings similar to that of Dichev (1999) can be carried out to see how the rankings are moving with each other. It is believable that the more the rankings differ, the less attention they receive.

Even though the media rankings may not reflect the true quality of MBA programs, the fact that people think that the rankings do give the rankings the capability in influencing people's decisions and creating real impacts on ranking users and stakeholders. As stated precisely by W.I. Thomas, "If men define situations as real, they are real in their consequences."

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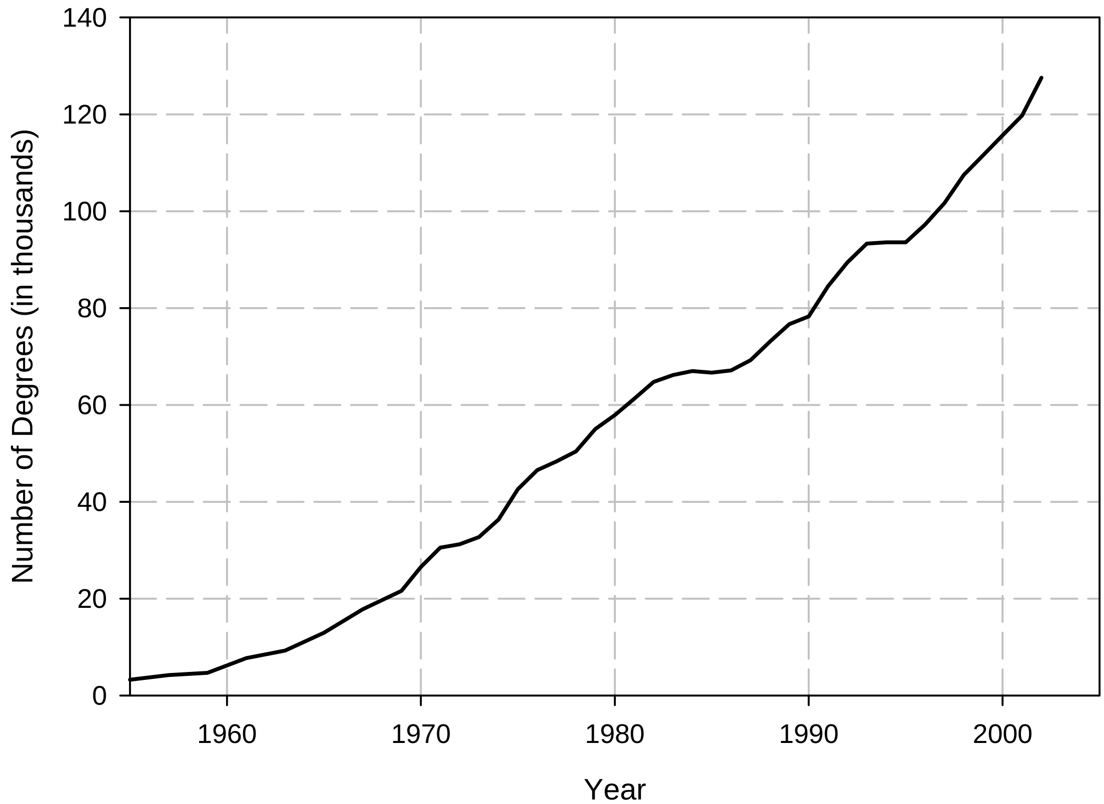
FIGURES

Figure 1: Total Number of Master Degrees in Business Conferred by U.S. Schools (1955-2002)



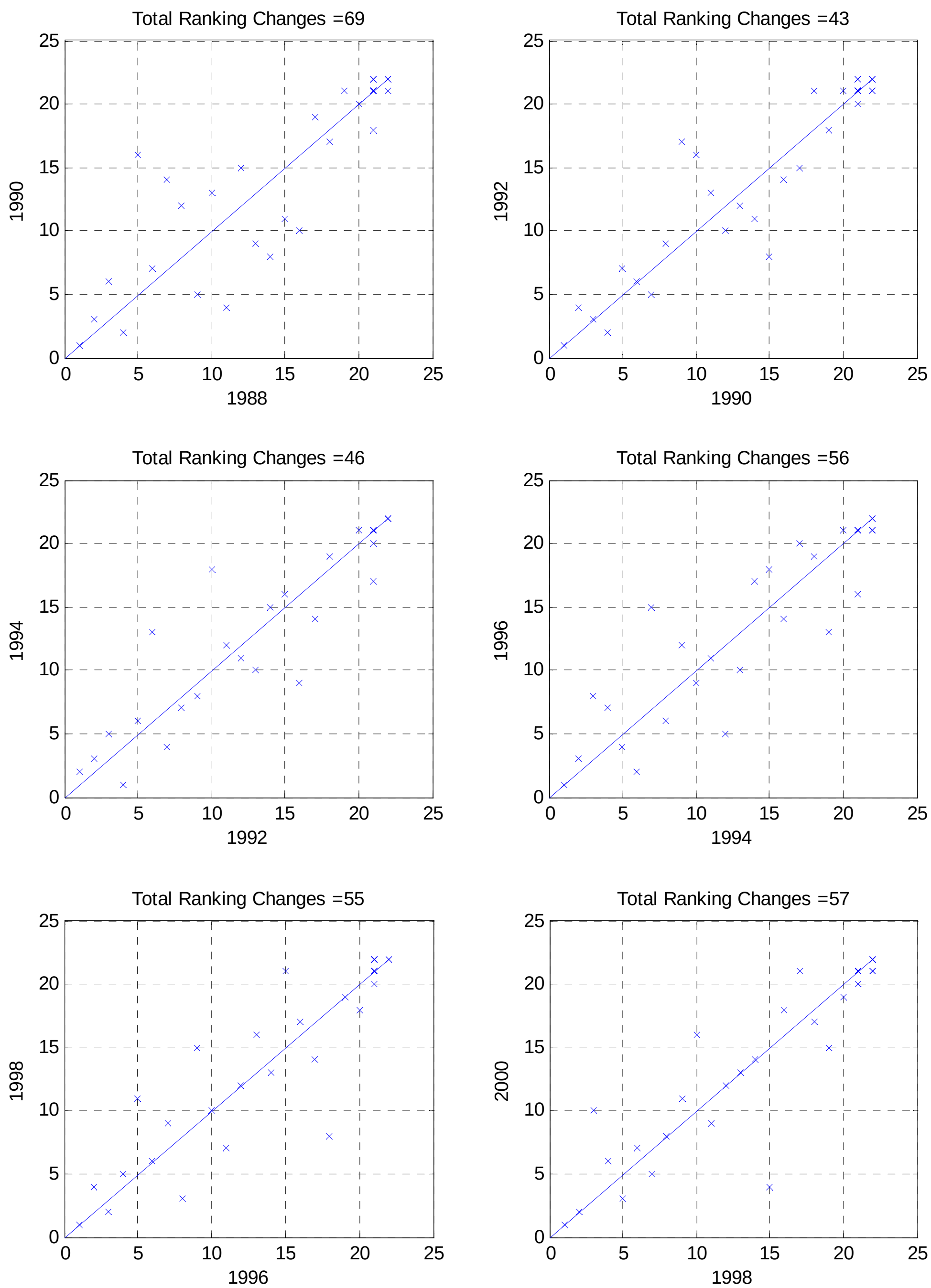
Source:

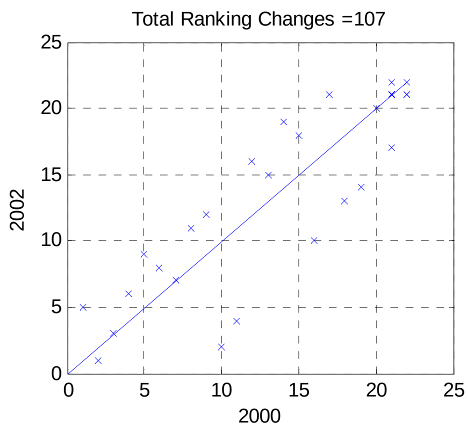
Digest of Education Statistics 2004, Table 278: Earned degrees in business conferred by degree-granting institutions, by level of degree and sex of student: Selected years, 1955-56 to 2002-03

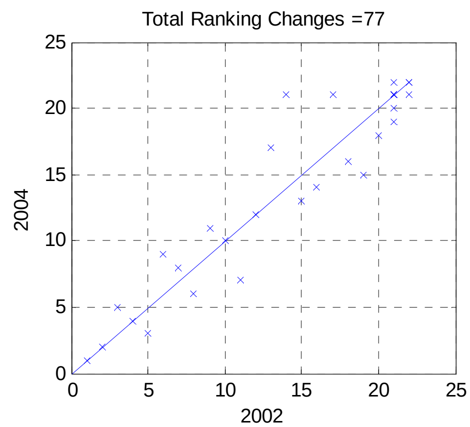
Figure 2: A Brief History of MBA Program Rankings

1976	Standard & Poor (S&P) ranking published (based on the number of executive alumni)
1980	Standard & Poor (S&P) ranking published
1982	Standard & Poor (S&P) ranking published
1985	Standard & Poor (S&P) ranking published Brecker & Merryman (BM) ranking published (based on survey of corporate recruiters)
March 1986	BW magazine reported business school data of 1985 Louis Harris & Associates (LHA) ranking published (based on survey of executives)
1987	Standard & Poor (S&P) ranking published Heidrick & Struggles (HS) ranking published (based on survey of chief executives)
Nov 1987	USNWR ranking published with business school data of 1987 (based on survey of business school deans)
Early 1988	Barron's Guide to Graduate Business Schools published with business school data of 1987 (no ranking) BW magazine reported BM, USNWR, HS rankings with business school data of 1987 First Economist Intelligence Unit's (EIU) MBA Program Guide published (no ranking)
Nov 1988	First BW ranking published in magazine with business school data of 1988 (based on survey of graduates and recruiters); 2nd and 3rd tier schools were not reported
March 1990	First USNWR ranking with new methodology (see Table 1)
Oct 1990	First edition of BW Guide to the Best Business Schools published with business school data of 1988/89; 2nd and 3rd tier schools were reported
Oct 1991	Second edition of BW Guide to the Best Business Schools published with business school data of 1990
1999	First Financial Times ranking (see Table 1)
2000	First Forbes ranking (see Table 1)
2001	First Wall Street Journal ranking (see Table 1)
2002	First EIU ranking (see Table 1)

Figure 3: Year-to-Year Changes in Top Tier Rankings (1988-2004)



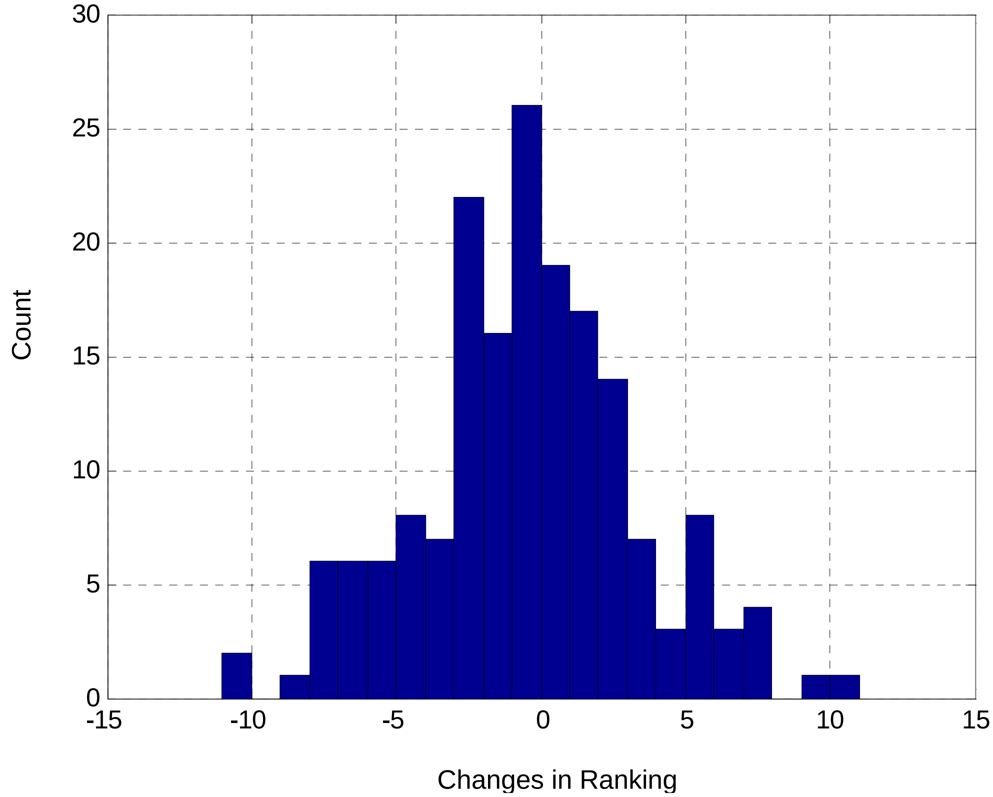




Notes:

The plots only show the movements of the top 20 schools. The schools that are ranked below 20 and in the second tier are given a value of 21 while those in the third tier are given a value of 22. However, the total ranking changes were computed by summing the movements of all the top tier schools for the year labeled on the x-axis.
For interpretation, notice that the schools lying on the straight line did not change in their rankings while those lying above the line dropped in their rankings and similarly for those below the line.

Figure 4: Histogram of Year-to-Year Changes in Top Tier Rankings (1988-2004)



Change	-11	-10	-9	-8	-7	-6	-5	-4	-3	-2	-1	0	1	2
Count	2	0	1	6	6	6	8	7	22	16	26	19	17	14

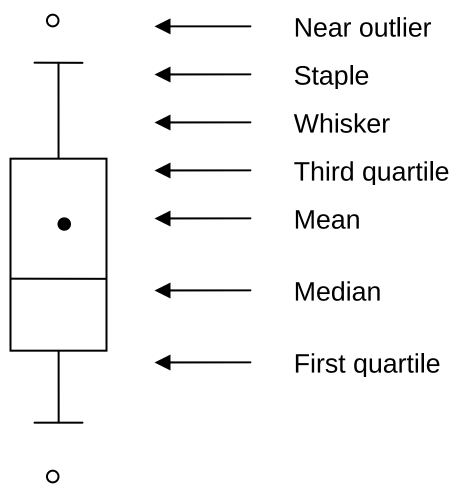
3	4	5	6	7	8	9	10
7	3	8	3	4	0	1	1

Note:

The changes for all top tier schools of the prior years are included.

Figure 5: Summary Statistics of Data Used in Analysis

Box Plot Elements:



Element	Definition
Near outlier	The data between the inner and outer fences
Staple	The data that are outside the first and third quartiles but within the inner fences
Whisker	
Third quartile	The point below which 75% of the ranked data lie
Mean	Average of the data
Median	The point below which 50% of the ranked data lie
First quartile	The point below which 25% of the ranked data lie

Notes:

IQR = interquartile range/the difference between the first and third quartiles (middle 50% of the data)

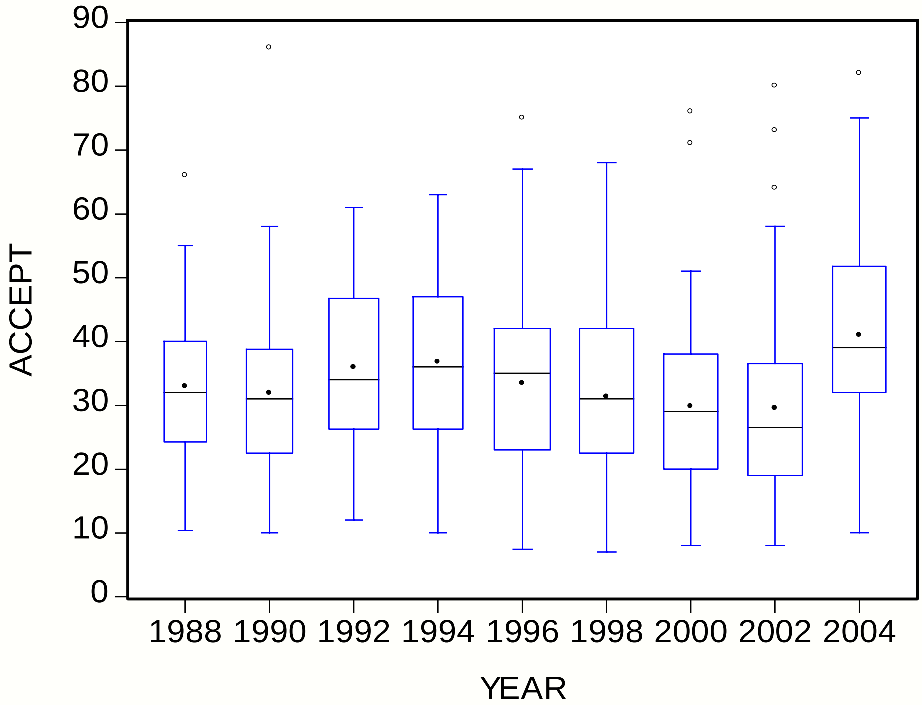
Inner fences = the first quartile minus 1.5*IQR and the third quartile plus 1.5*IQR

Outer fences = the first quartile minus 3.0*IQR and the third quartile plus 3.0*IQR

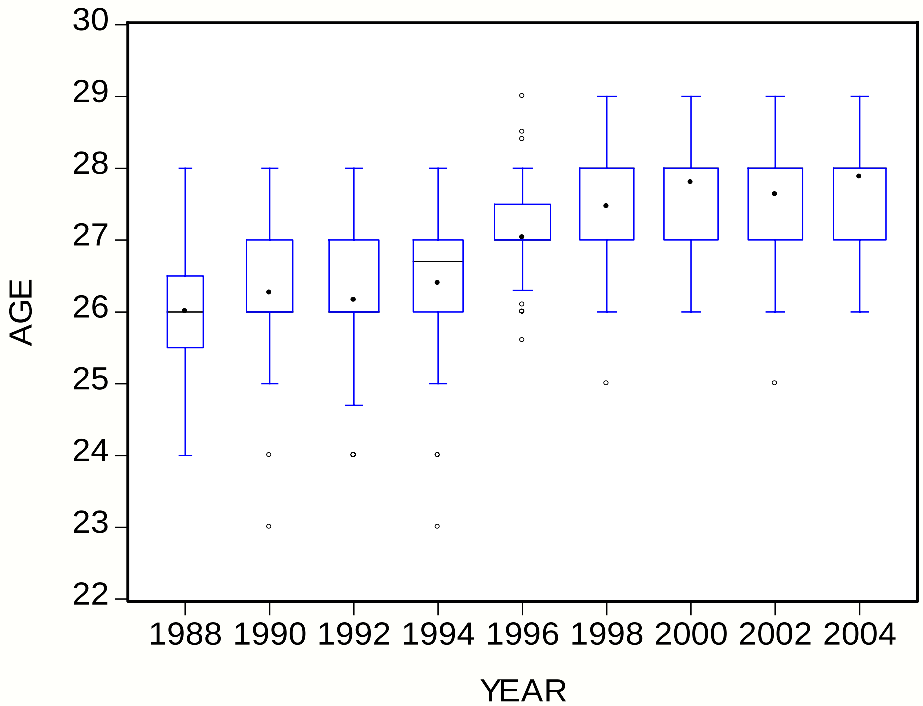
The data lying beyond the outer fences are not included.

The box width is proportional to the number of observations in each series.

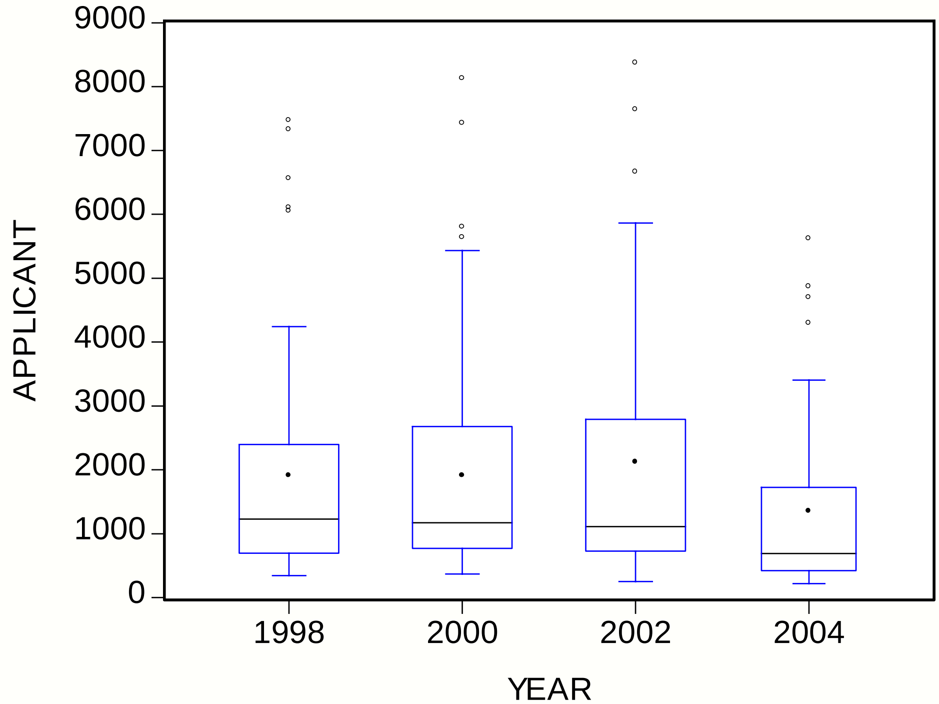
By visually drawing a line joining the solid dots representing the mean, one can observe the general movement and trend of the mean of the variable over the years.



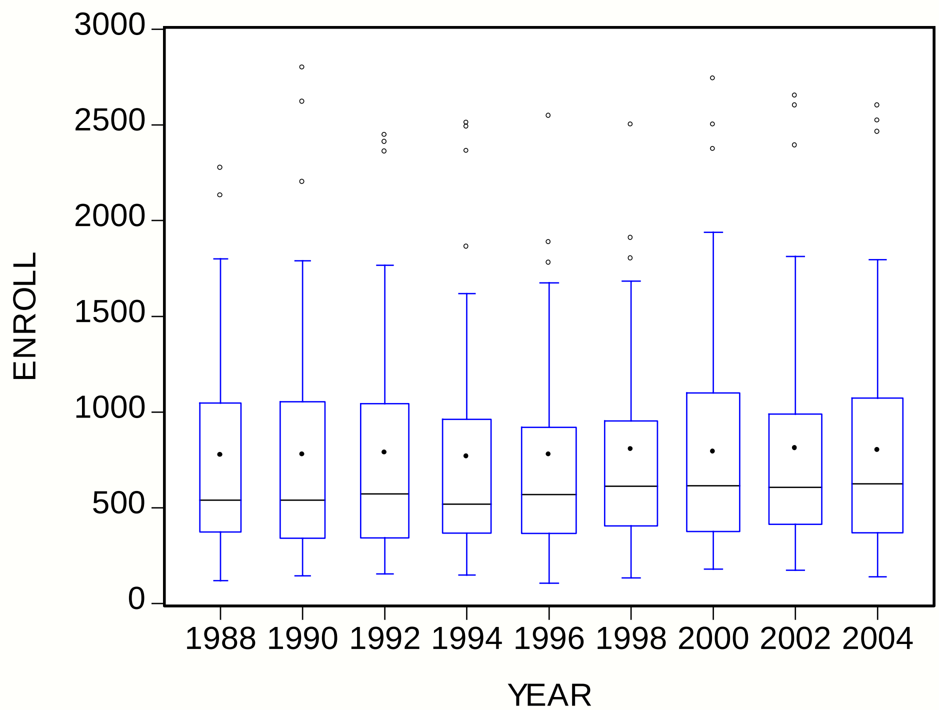
ACCEPT
90
80
70
60
50
40
30
20
10
0
1988 1990 1992 1994 1996 1998 2000 2002 2004
YEAR



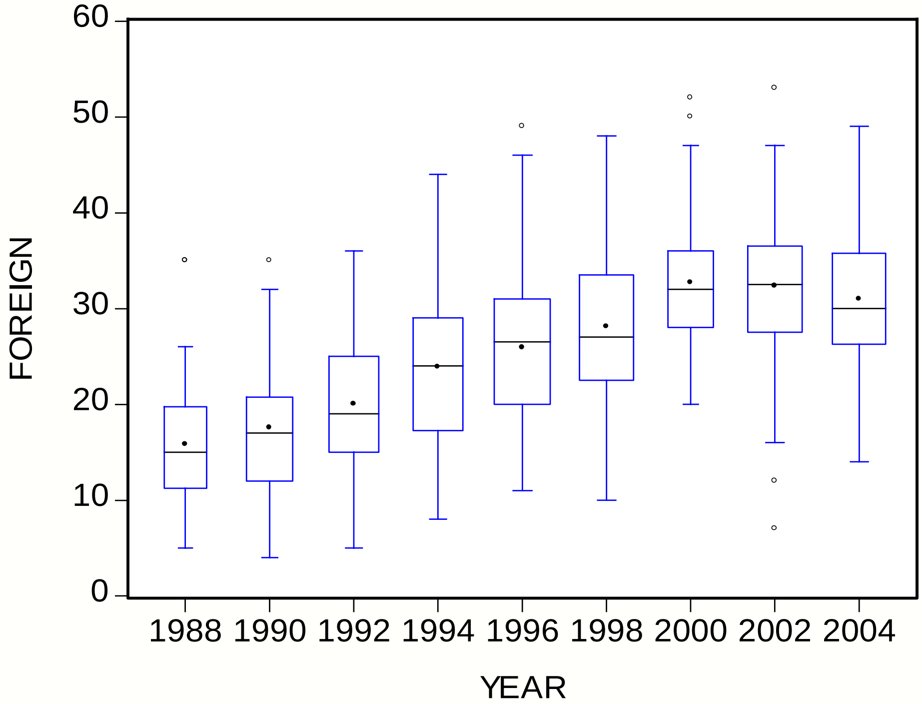
AGE
30
29
28
27
26
25
24
23
22
1988 1990 1992 1994 1996 1998 2000 2002 2004
YEAR



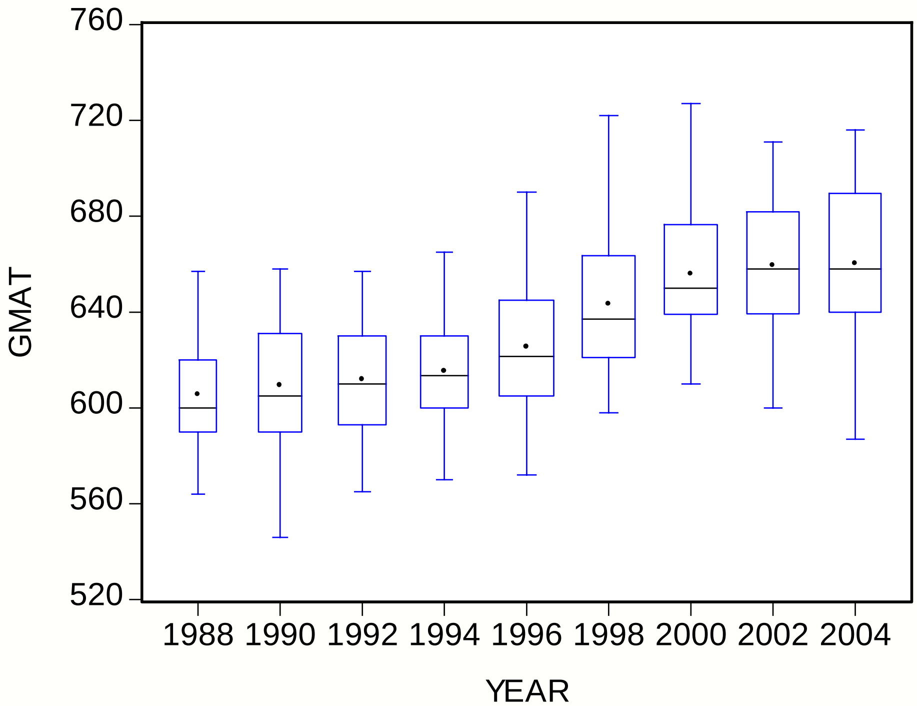
9000
8000
7000
6000
5000
4000
3000
2000
1000
0
APPLICANT
1998
2000
2002
2004
YEAR



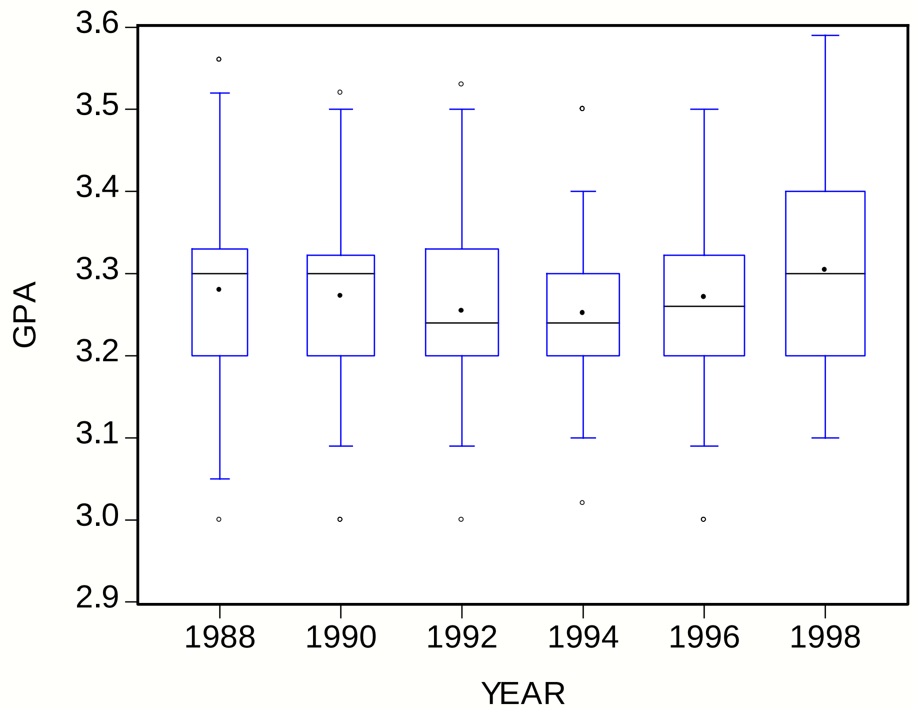
3000
2500
2000
1500
1000
500
0
ENROLL
1988
1990
1992
1994
1996
1998
2000
2002
2004
YEAR

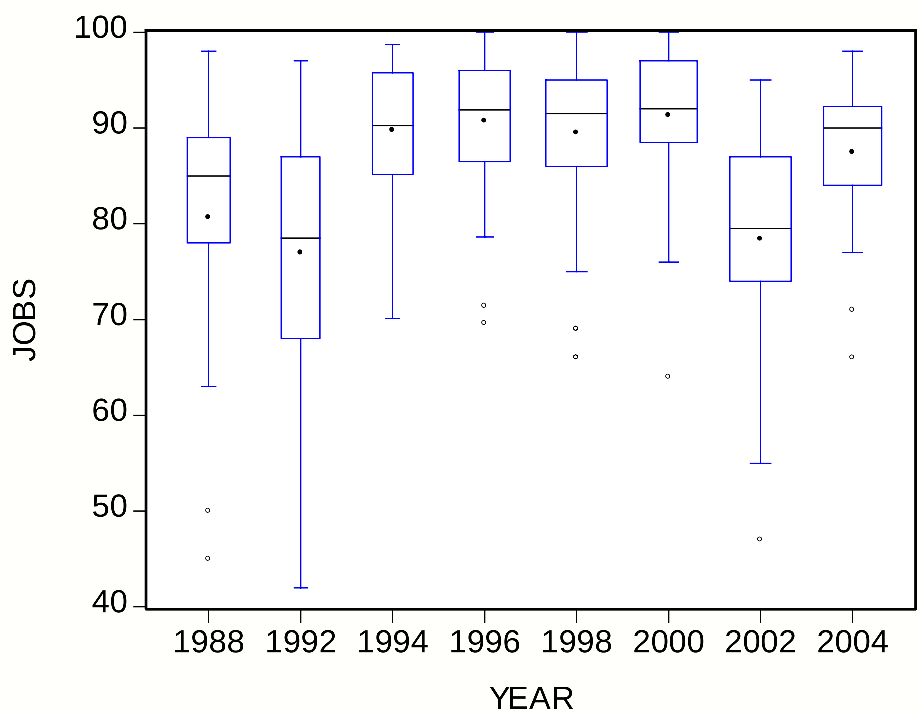


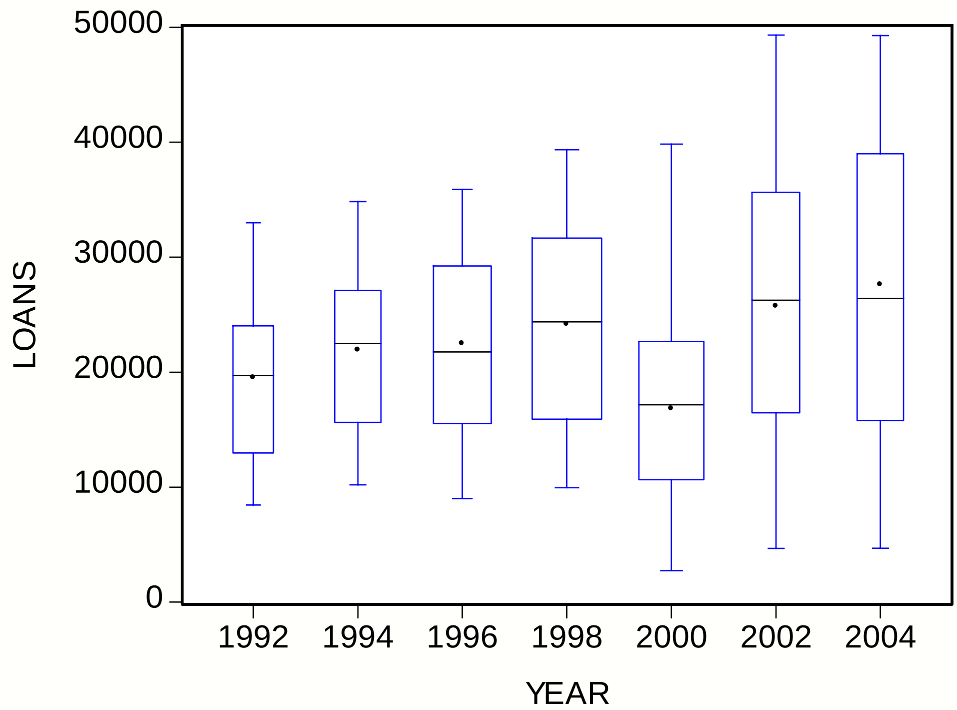
60
50
40
30
20
10
0
FOREIGN
1988 1990 1992 1994 1996 1998 2000 2002 2004
YEAR



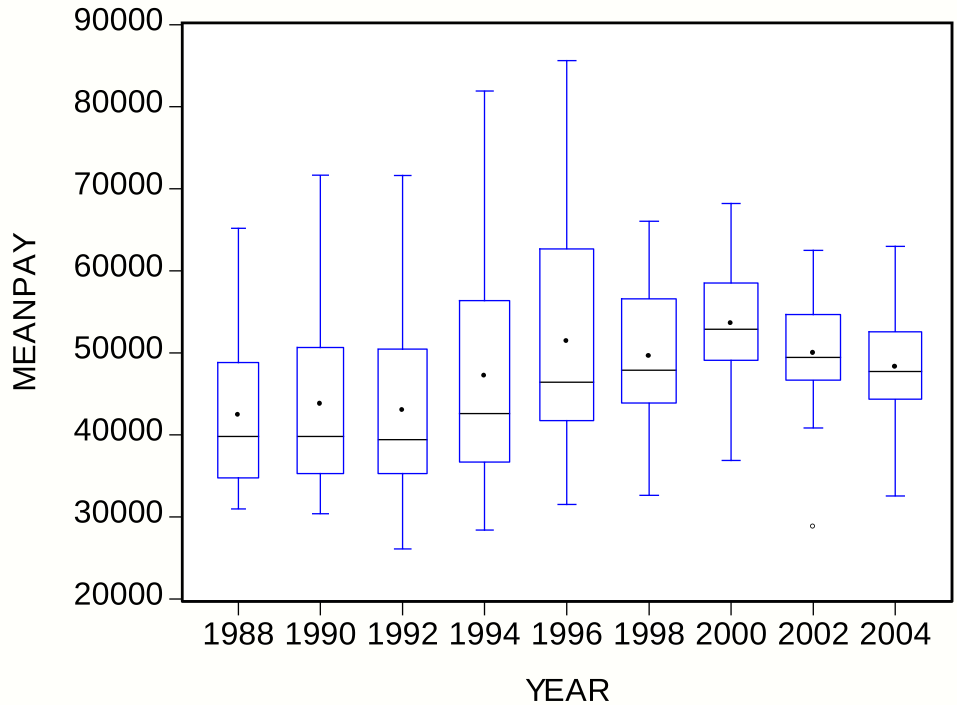
760
720
680
640
600
560
520
GMAT
1988 1990 1992 1994 1996 1998 2000 2002 2004
YEAR


3.6
3.5
3.4
3.3
3.2
3.1
3.0
2.9
GPA
1988
1990
1992
1994
1996
1998
YEAR

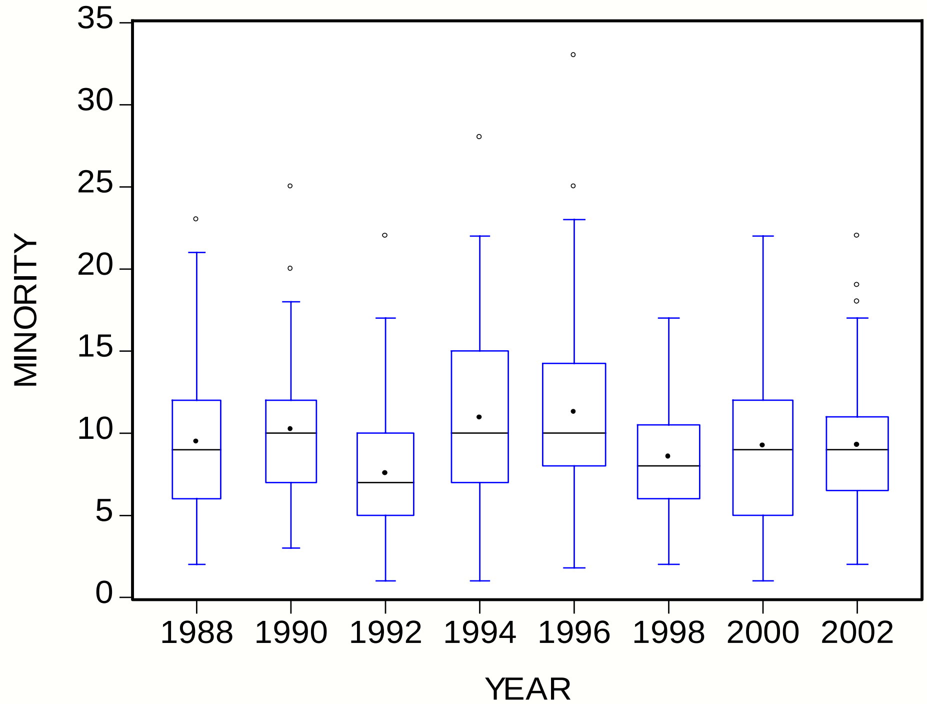

100
90
80
70
60
50
40
JOBS
1988
1992
1994
1996
1998
2000
2002
2004
YEAR

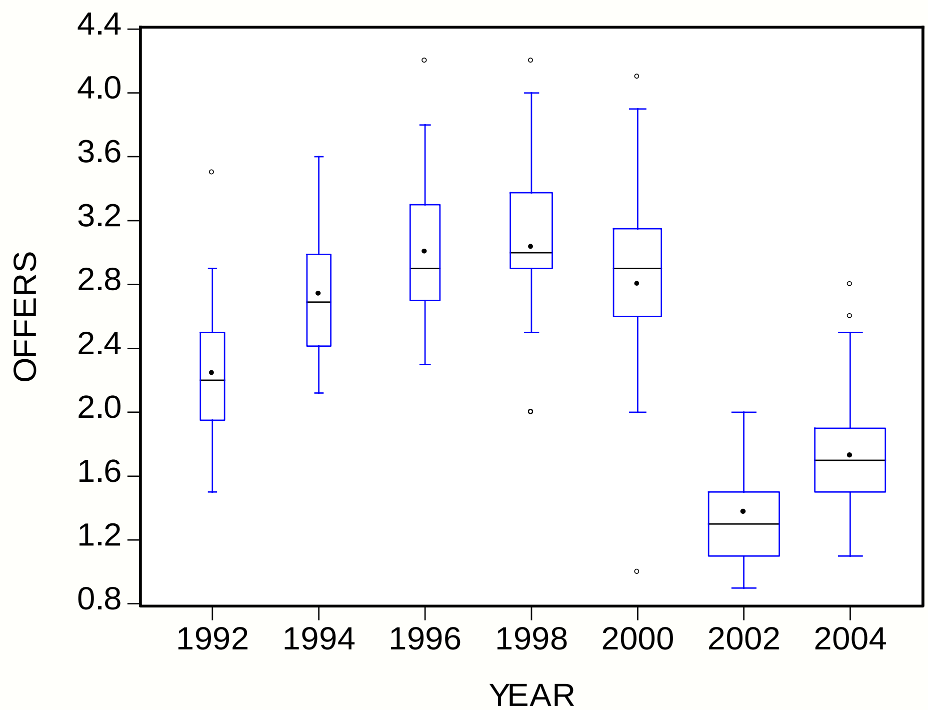


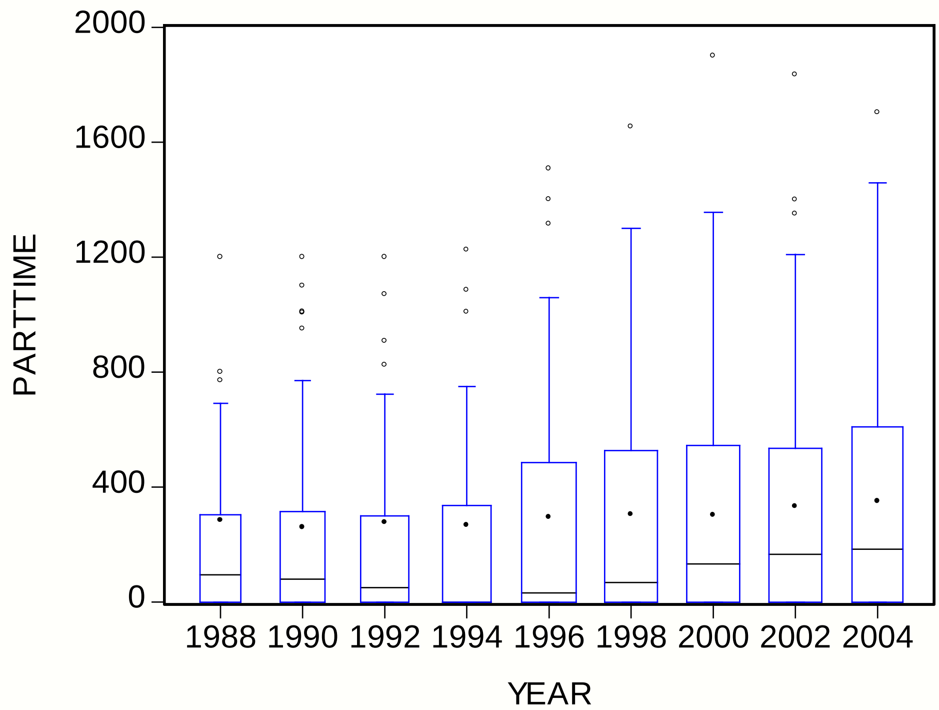
LOANS
50000
40000
30000
20000
10000
0
1992 1994 1996 1998 2000 2002 2004
YEAR



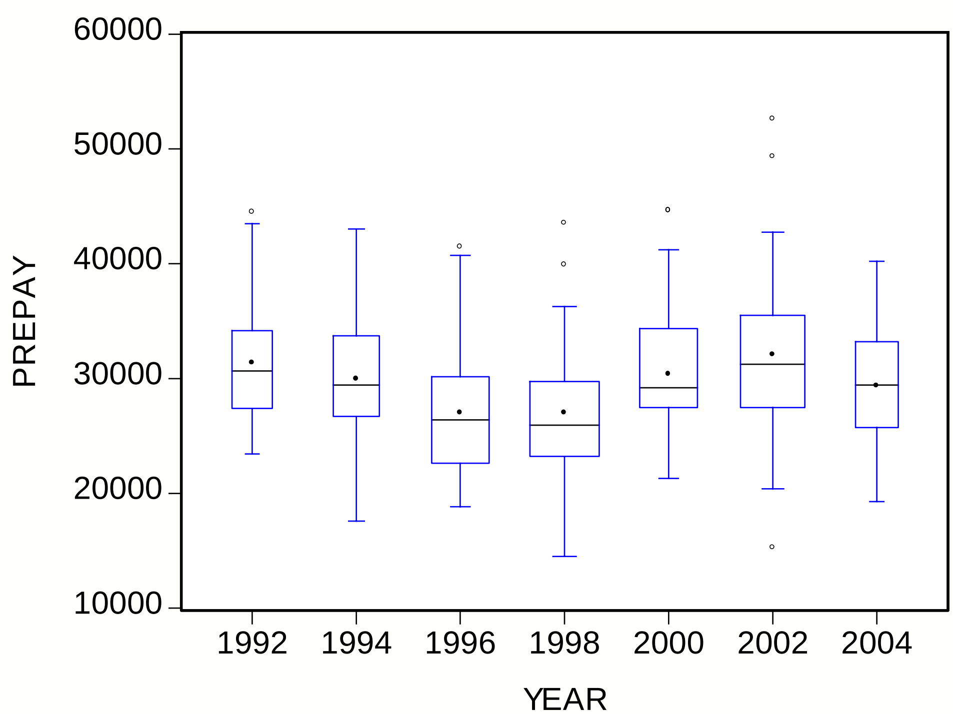
MEANPAY
90000
80000
70000
60000
50000
40000
30000
20000
1988 1990 1992 1994 1996 1998 2000 2002 2004
YEAR


MINORITY
35
30
25
20
15
10
5
0
1988
1990
1992
1994
1996
1998
2000
2002
YEAR

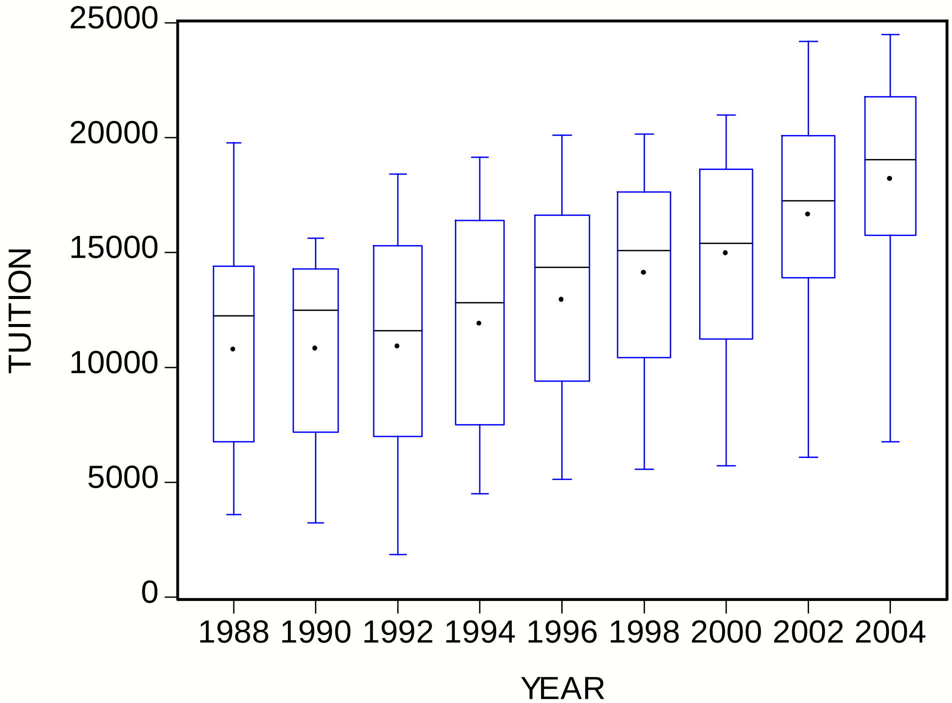

OFFERS
4.4
4.0
3.6
3.2
2.8
2.4
2.0
1.6
1.2
0.8
1992
1994
1996
1998
2000
2002
2004
YEAR

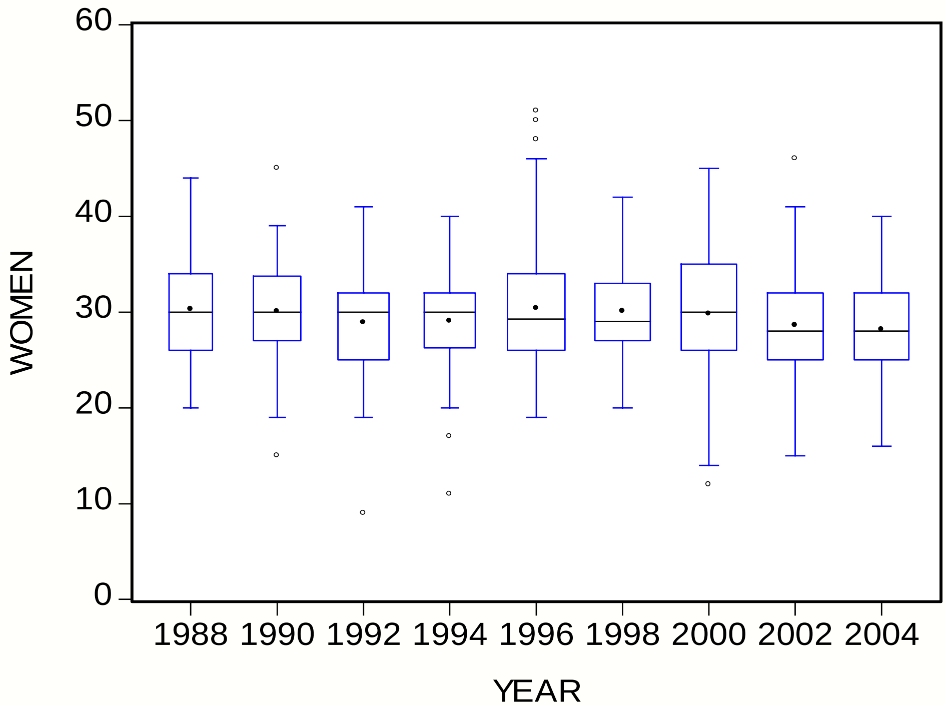


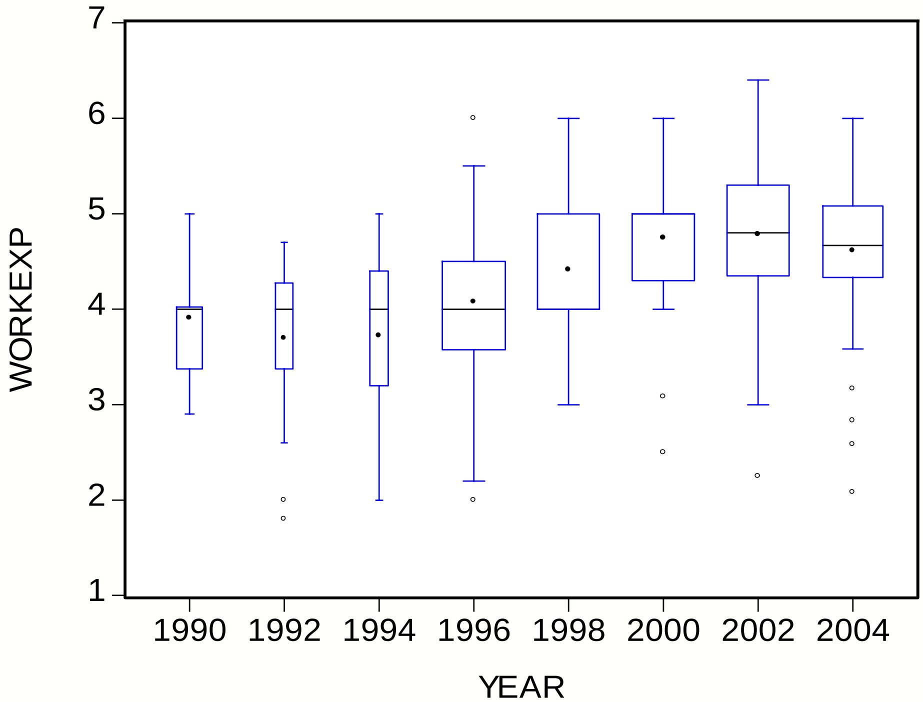
2000
1600
1200
800
400
0
PARTTIME
1988 1990 1992 1994 1996 1998 2000 2002 2004
YEAR

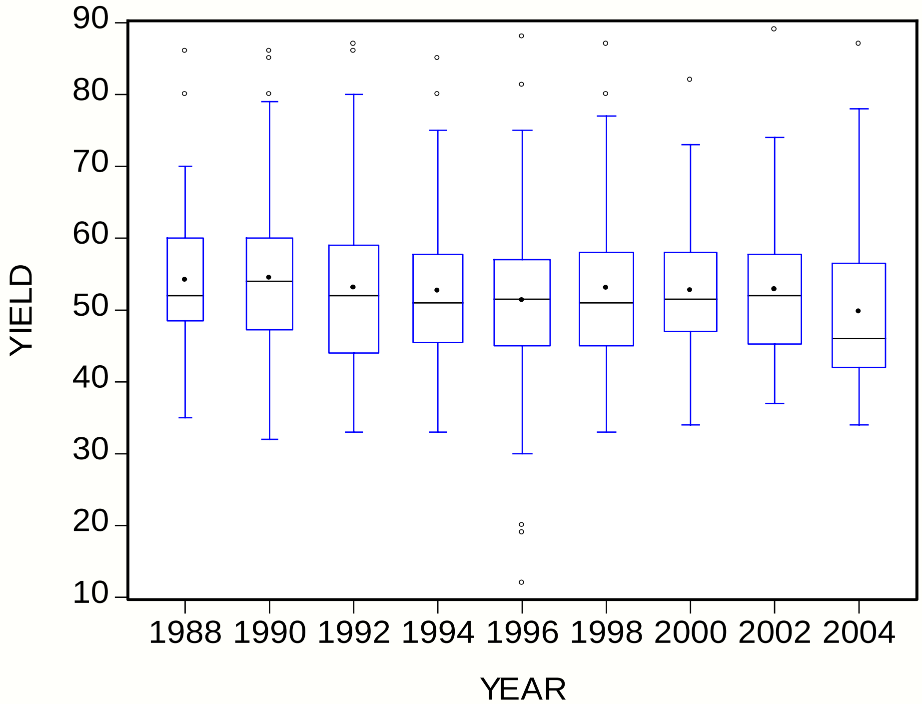


60000
50000
40000
30000
20000
10000
PREPAY
1992 1994 1996 1998 2000 2002 2004
YEAR


25000
20000
15000
10000
5000
0
TUITION
1988 1990 1992 1994 1996 1998 2000 2002 2004
YEAR


60
50
40
30
20
10
0
WOMEN
1988 1990 1992 1994 1996 1998 2000 2002 2004
YEAR


WORKEXP
7
6
5
4
3
2
1
1990 1992 1994 1996 1998 2000 2002 2004
YEAR


YIELD
90
80
70
60
50
40
30
20
10
1988 1990 1992 1994 1996 1998 2000 2002 2004
YEAR

YEAR	1988 Top 20	1990 Top 20	1992 Top 20	1994 Top 20	1996 Top 25	1998 Top 25	2000 Top 30	2002 Top 30	2004 Top 30
DUM2ND	20	20	20	20	25	25	20	20	20
DUM3RD	7	11	15	15	12	10	10	10	9

Note: The numbers of schools in 2nd and 3rd tiers for each year are indicated.

TABLES

Table 1: Summary of Media Rankings for Graduate Business Schools and the Criteria Used

Publication	First Survey	Survey Frequency	Weight & Ranking Criteria
Business Week	1988	Biannual	45% students' survey, one-half weight to graduating students, one-quarter weight to each of the two prior student survey groups 45% recruiters' survey, one-half weight to current recruiters, one-quarter weight to each of the two prior recruiter survey groups 10% faculty publications
U.S. News & World Report	1990	Annual	40% Survey of business school deans 35% starting salaries, employment rates, etc. 25% undergraduate GPA, student GMAT score, acceptance rate to program
Financial Times	1999	Annual	20% recent salary level 20% 3-year growth in salary post MBA 10% faculty publications 8% international faculty & students 5% doctoral student placement 5% faculty with doctorate 4% women faculty & students 28% eleven other criteria
Forbes	2000	Biannual	Comparison of the additional salary earned over five years after receiving the MBA to the cost of tuition based on a survey of graduates
Wall Street Journal	2001	Annual	One-third weighting to each of: • Recruiter perception of school and its students based on 20 attributes • Absolute number of recruiters coming to the school • Recruiter likelihood of

			recruiting (and of making an offer) at the school in the next two years
Economist Intelligence Unit (Which MBA)	2002	Annual	35% Open new career opportunities 35% Personal development/educational experience 20% Increase salary 10% Potential to network

Sources:

http://www.businessweek.com
http://usnews.com
http://rankings.ft.com
http://www.forbes.com
http://online.wsj.com
http://mba.eiu.com/

Table 2: Business Week Survey Response Rate (1988–2004)

Edition	Year	Number of Surveys Sent to Graduates	Number of Schools Included	Number of Questions in Survey	Number of Graduates who Responded	Graduates' Response Rate	Number of Surveys Sent to Recruiters	Number of Recruiters who Responded	Recruiters' Response Rate
1st	1988	3,000	23	35	1,245	42	265	112	42
2nd	1990	5,885	32	30	3,650	62	322	149	46
3rd	1992	6,000	36	34	4,712	78	352	199	57
4th	1994	6,000	40	36	4,608	73	354	254	72
5th	1996	7,235	51	36	4,830	67	326	227	70
6th	1998	9,598	61	39	6,020	63	350	259	74
7th	2000	16,843	82	45	10,039	60	419	247	59
8th	2002	16,906	88	45	11,518	68	420	219	52
9th	2004	NA[1]	NA	NA	NA	NA	NA	NA	NA

<u>Sources:</u>

Business Week Guide to Best Business Schools (1st edition to 8th edition)

[1] NA means data not available

Table 3: Summary of 67 Business Schools Ranked by Business Week

Full name	Name used in Database	School's Alias	Alias Started on (edition)	First Appeared in (edition)
American Graduate School of International Management	AGSIM	Thunderbird	2nd	2nd
Arizona State University	Arizona State	-	-	3rd
Babson College	Babson	F.W. Olin	5th	5th
Baruch College	Baruch	-	-	3rd
Boston College	Boston	Carroll	5th	5th
Boston University	Boston U	-	-	2nd
Brigham Young University	Brigham	Marriott	2nd	2nd
Carnegie Mellon University	CMU	Tepper	9th	1st
Case Western Reserve University	CWRU	Weatherhead	1st	1st
Claremont Graduate School	Claremont	Drucker	2nd	2nd
College of William and Mary	College of William and Mary	-	-	2nd
Columbia University	Columbia	-	-	1st
Cornell University	Cornell	Johnson	1st	1st
Dartmouth College	Dartmouth	Amos Tuck	1st	1st
Duke University	Duke	Fuqua	1st	1st
Emory University	Emory	Goizueta	4th	1st
Georgetown University	Georgetown	McDonough	6th	1st
Georgia Institute of Technology	Georgia Tech	DuPree	5th	1st
Harvard University	Harvard	-	-	1st
Indiana University	Indiana	Kelley	7th	1st
Massachusetts Institute of Technology	MIT	Sloan	1st	1st
Michigan State University	Michigan State	Broad	3rd	1st
New York University	NYU	Stern	1st	1st
Northwestern University	Northwestern	Kellogg	1st	1st
Ohio State University	OSU	Fisher	4th	1st
Pennsylvania State University	Penn State	Smeal	2nd	1st
Purdue University	Purdue	Krannert	1st	1st
Rensselaer Plytechnic Institute	RPI	-	-	1st
Rice University	Rice	Jones	3rd	3rd
Southern Methodist University	Southern Methodist	Cox	1st	1st
Stanford University	Stanford	-	-	1st
Texas A&M University	Texas A&M	Mays	5th	3rd
Tulane University	Tulane	Freeman	1st	1st
University at Buffalo, SUNY	Buffalo	-	-	1st
University of Alabama	Alabama	Manderson	3rd	3rd
University of Arizona	Arizona	Eller	5th	1st
University of California at Berkeley	Berkeley	Haas	1st	1st
University of California at Davis	Davis	-	-	7th
University of California at Irvine	Irvine	-	-	6th
University of California at Los Angeles	UCLA	Anderson	1st	1st
University of Chicago	Chicago	-	-	1st
University of Florida	Florida	Warrington	6th	1st
University of Georgia	Georgia	Terry	4th	1st

University of Illinois Urbana Champaign	UIUC	-	-	1st
University of Iowa	Iowa	Tippie	7th	1st
University of Kansas at Lawrence	Lawrence	-		3rd
University of Kentucky	Kentucky	Gatton	5th	3rd
University of Maryland at College Park	Maryland	Smith	6th	3rd
University of Massachusetts at Amherst	Amherst	-	-	1st
University of Michigan	Michigan	Ross	9th	1st
University of Minnesota	Minnesota	Carlson	1st	1st
University of North Carolina at Chapel Hill	North Carolina	Kenan-Flagler	3rd	1st
University of Notre Dame	Notre Dame	Mendoza	7th	1st
University of Pennsylvania	Penn	Wharton	1st	1st
University of Pittsburgh	Pitt	Katz	1st	1st
University of Rochester	Rochester	Simon	1st	1st
University of South Carolina	South Carolina	Moore	6th	6th
University of Southern California	USC	Marshall	6th	1st
University of Tennessee at Knoxville	Tennessee	-	-	3rd
University of Texas at Austin	Texas Austin	McCombs	7th	1st
University of Virginia	Virginia	Darden	1st	1st
University of Washington	University of Washington	-	-	1st
University of Wisconsin-Madison	Wisconsin Madison	-	-	1st
Vanderbilt University	Vanderbilt	Owen	2nd	2nd
Wake Forest University	Wake Forest	Babcock	1st	1st
Washington University	Washington U	J.M. Olin	1st	1st
Yale University	Yale	-	-	1st

Notes:

1st edition in 1988
2nd edition in 1990
3rd edition in 1992
4th edition in 1994
5th edition in 1996
6th edition in 1998
7th edition in 2000
8th edition in 2002
9th edition in 2004

Table 4: Historical Rankings of 67 Business Schools Ranked by Business Week (1988-2004)

Schools	1988 Top 20	1990 Top 20	1992 Top 20	1994 Top 20	1996 Top 25	1998 Top 25	2000 Top 30	2002 Top 30	2004 Top 30
AGSIM	u	t	s	s	25	s	s	s	s
Alabama	u	u	t	t	t	u	u	u	u
Amherst	t	t	u	u	u	u	u	u	u
Arizona	t	u	u	u	t	s	t	t	t
Arizona State	u	u	t	t	t	s	s	s	s
Babson	u	u	u	u	s	s	s	s	26
Baruch	u	u	t	t	t	u	u	u	u
Berkeley	17	19	18	19	13	16	18	13	17
Boston	u	u	u	u	t	t	t	s	s
Boston U	u	t	u	u	t	t	s	t	s
Brigham	u	t	t	t	s	s	t	s	s
Buffalo	s	t	t	t	t	t	t	t	t
Chicago	11	4	2	3	8	3	10	2	2
Claremont	u	t	u	u	u	u	u	u	u
CMU	13	9	17	14	17	14	14	19	15
College of William and Mary	u	t	u	u	t	s	s	s	t
Columbia	14	8	9	8	6	6	7	7	8
Cornell	5	16	14	15	18	8	8	11	7
CWRU	s	s	s	s	s	t	t	s	s
Dartmouth	3	6	6	13	10	10	16	10	10
Davis	u	u	u	u	t	t	s	t	u
Duke	10	13	12	11	11	7	5	9	11
Emory	t	s	s	s	s	s	28	22	20
Florida	s	s	t	t	t	t	s	t	t
Georgetown	s	t	s	s	s	s	26	30	25
Georgia	s	t	t	t	s	s	s	t	s
Georgia Tech	t	t	t	t	s	t	30	s	s
Harvard	2	3	3	5	4	5	3	3	5
Indiana	12	15	8	7	15	21	20	20	18
Iowa	s	s	s	s	s	s	s	s	s
Irvine	u	u	u	u	t	s	s	s	s
Kentucky	u	u	t	t	t	u	u	u	u
Lawrence	u	u	t	t	u	u	u	u	u
Maryland	u	u	t	t	s	22	27	25	28
Michigan	6	7	5	6	2	4	6	8	6
Michigan State	s	s	s	s	s	s	29	23	s
Minnesota	s	s	s	s	s	t	s	s	s
MIT	15	11	13	10	9	15	4	6	9
North Carolina	8	12	10	18	19	19	15	18	16
Northwestern	1	1	1	2	3	2	2	1	1
Notre Dame	s	s	s	s	s	s	s	29	24
NYU	18	17	15	16	14	13	13	15	13
OSU	s	s	t	t	s	s	s	s	s
Penn	4	2	4	1	1	1	1	5	3
Penn State	s	s	s	s	s	s	s	s	s
Pitt	s	s	s	s	s	s	s	s	t
Purdue	s	s	s	20	s	24	25	26	21
Rice	u	s	t	t	s	s	s	s	s
Rochester	20	20	s	s	21	s	21	27	29
RPI	t	u	u	u	u	u	u	u	u
South Carolina	u	u	u	u	u	s	t	t	t

Southern Methodist	s	s	s	s	23	s	s	s	s
Stanford	9	5	7	4	7	9	11	4	4
Tennessee	u	u	t	t	s	s	t	t	t
Texas A&M	u	u	t	t	s	s	t	t	t
Texas Austin	s	18	s	17	20	18	17	21	19
Tulane	t	t	s	s	s	t	t	t	t
UCLA	16	10	16	9	12	12	12	16	14
UIUC	s	s	s	s	s	s	s	s	s
University of Washington	s	s	s	s	s	t	t	s	s
USC	s	s	s	s	s	25	24	17	27
Vanderbilt	u	s	19	s	24	s	22	28	30
Virginia	7	14	11	12	5	11	9	12	12
Wake Forest	t	u	u	u	s	s	s	s	s
Washington U	s	s	20	s	16	17	23	24	23
Wisconsin Madison	s	s	s	s	s	23	s	s	s
Yale	19	s	s	s	22	20	19	14	22

Notes:

'u' means unranked/dropped out of the BW ranking entirely
's' means second tier
't' means third tier

Table 5: Inter-tier Changes in Business Week Ranking (1988-2004)

	1st Tier	2nd Tier	3rd Tier
1st Tier	177	13	0
2nd Tier	22	128	21
3rd Tier	1	25	51

Note:

This table can be interpreted similar to a Markov chain matrix. For instance, there are 13 incidences in which a school dropped from the 1st tier to the 2nd tier between 1988 and 2004.

Table 6: Variable Descriptions

Variable	Definition
accept	Acceptance rate in percent (the ratio of the number of applicants accepted to the total number of applicants)
age	Average age of student (in years)
applicant	Total number of applicants
dum2nd	Dummy variable:1 if ranked as 2nd tier, 0 otherwise
dum3rd	Dummy variable:1 if ranked as 3rd tier, 0 otherwise
enroll	Total enrollment (full time, part time, distance and executive MBA students)
foreign	Percent of international students
gmat	Average GMAT scores of entering class
gpa	Average undergraduate GPA of entering class
gradrank	Ranking based on graduates survey only
jobs	Percent of recent graduates who receive job offers within six months after commencement/Placement rate
loans	Average outstanding MBA loans per student of recent graduates adjusted to 1988 dollar
meanpay	Average starting base salary of recent graduates adjusted to 1988 dollar (excluding bonus)
minority	Percent of minority (includes Black, Hispanic and American Indian)
offers	Average number of job offers per recent graduate
parttime	Total part time enrollment (part time, distance and executive MBA students)
prepay	Average base salary of entering class prior to attending MBA program adjusted to 1988 dollar (excluding bonus)
rank	BW ranking
recrank	Ranking based on recruiter survey only
tuition	Non-resident annual tuition adjusted to 1988 dollar for full-time student
women	Percent of female students
workexp	Average work experience of entering class (in years)
yield	Yield rate in percent (the ratio of the number of applicants accepted who enroll to the total number of applicants accepted)

Notes:

Ranking for the schools in the 2nd and 3rd tiers are given the value of the last position of the 1st tier for the years they are ranked. For example, the 2nd and 3rd tiers schools in 1988 are given a value of 20 since BW listed top 20 schools in the 1st tier.

Meanpay, prepay, loan and tuition are adjusted to 1988 dollars by the seasonally adjusted consumer price index for all urban consumers and all goods published by the Federal Reserves (series ID: CPIAUCSL).

Table 7: Data Availability

Variables	Data not available for
age	3rd tier schools in 1988
applicant	All schools prior to 1998
foreign	3rd tier schools in 2000
gmat	3rd tier schools in 1988
gpa	All schools from 2000 to 2004
gradrank	2nd and 3rd tiers schools from 1988 to 2002, all schools in 2004
jobs	All schools in 1990, 3rd tier schools from 1992 to 1996
loans	All schools in 1988 and 1990, 2nd and 3rd tiers schools in 1992, 3rd tier schools in 1994 and 1996, some schools in 2002 and 2004
minority	All schools in 2004
offers	All schools in 1988 and 1990, 2nd and 3rd tiers schools from 1992 to 1996, 2nd tier schools in 1998 and 2000
prepay	All schools in 1988 and 1990, 2nd and 3rd tiers schools in 1992, 3rd tier schools in 1994, 1996 and 2000
recrank	2nd and 3rd tiers schools from 1988 to 2002, all schools in 2004
workexp	All schools in 1988, some schools in 1990, 1992 and 1994
yield	3rd tier schools in 1988

Table 8: Correlation Among Variables

	rank	*recrank*	*enroll*	*women*	*foreign*	*minority*	*parttime*	*age*	*accept*	*yield*	*gradrank*	*tuition*	*gmat*	*gpa*	*meanpay*	*jobs*	*workexp*	*offers*	*prepay*	*loans*	*applicant*
rank	1																				
recrank	**0.85**	1																			
enroll	-0.47	-0.43	1																		
women	0.02	-0.10	0.12	1																	
foreign	0.19	0.26	0.12	0.05	1																
minority	-0.23	-0.15	0.15	0.08	0.01	1															
parttime	-0.09	-0.15	**0.82**	0.09	0.07	0.01	1														
age	0.10	0.24	0.13	0.00	0.35	0.06	0.14	1													
accept	**0.54**	0.38	-0.15	-0.02	0.04	-0.26	0.05	-0.15	1												
yield	-0.38	-0.48	0.16	-0.02	-0.06	0.05	-0.13	-0.05	-0.33	1											
gradrank	**0.74**	0.40	-0.13	-0.02	0.29	-0.08	-0.03	0.10	0.35	-0.26	1										
tuition	-0.29	-0.17	0.38	-0.03	0.45	0.12	0.20	0.39	-0.18	0.00	-0.13	1									
gmat	-0.34	-0.23	0.26	-0.11	0.33	0.16	0.07	**0.51**	**-0.59**	0.21	-0.17	**0.64**	1								
gpa	-0.34	-0.28	0.20	-0.02	0.11	0.07	-0.06	0.07	-0.42	0.45	-0.07	0.02	0.42	1							
meanpay	**-0.55**	-0.44	0.38	-0.06	0.26	0.26	0.07	0.38	**-0.57**	0.29	-0.37	**0.63**	**0.72**	0.36	1						
jobs	-0.31	-0.30	0.15	-0.05	0.03	0.16	0.04	0.20	-0.41	0.15	-0.21	0.23	0.44	0.26	**0.56**	1					
workexp	-0.01	0.17	0.14	-0.04	0.24	0.03	0.11	**0.71**	-0.20	0.01	0.03	0.39	0.44	0.11	0.34	0.12	1				
offers	**-0.52**	-0.23	0.19	0.05	-0.09	0.15	-0.05	-0.08	-0.40	0.35	-0.20	0.01	0.12	0.45	**0.57**	**0.61**	-0.11	1			
prepay	**-0.66**	**-0.55**	0.42	0.11	-0.05	0.16	0.10	0.14	**-0.55**	0.41	**-0.51**	**0.57**	**0.67**	0.32	**0.69**	0.22	0.32	0.17	1		
loans	-0.50	-0.24	0.38	0.04	0.09	0.10	0.16	0.13	-0.26	0.12	-0.22	**0.75**	0.49	0.24	**0.51**	0.23	0.22	0.08	**0.50**	1	
applicant	**-0.85**	**-0.68**	**0.60**	0.21	0.04	0.30	0.10	-0.03	**-0.65**	**0.57**	-0.50	**0.50**	**0.72**	**0.68**	**0.77**	0.24	0.09	0.37	**0.75**	0.50	1

Notes:

Ranking for the schools in the 2nd and 3rd tiers are given the value of the last position of the 1st tier for the years they are ranked.
For example, the 2nd and 3rd tiers schools in 1988 are given a value of 20 since BW listed top 20 schools.

Positive correlation above 0.5 (dark shading)
Negative correlation below -0.5 (light shading)

Table 9: BW Ranking and Admission Outcomes

	Dependent Variable				
	accept	*yield*	log *applicant*	log *accept*applicant*	log *accept*yield*applicant*
$rank_{t-1}$	0.388*** (0.132)	-0.130 (0.125)	-0.021*** (0.005)	-0.011*** (0.003)	-0.011*** (0.003)
$dum2nd_{t-1}$	0.639 (1.58)	1.24 (1.48)	-0.020 (0.018)	-0.142* (0.081)	-0.118** (0.050)
$dum3rd_{t-1}$	1.90 (1.99)	2.50 (1.90)	-0.262*** (0.047)	-0.230** (0.099)	-0.163** (0.067)
Lagged Dependent Variable	0.229*** (0.052)	0.208*** (0.051)	0.007 (0.240)	0.086 (0.303)	0.040 (0.356)
Constant	17.8*** (2.87)	42.8*** (3.86)	7.54*** (1.66)	5.69*** (1.72)	5.27*** (1.84)
R^2	0.79	0.69	0.97	0.94	0.95
SE	7.10	6.64	0.189	0.180	0.172
DW	1.94	2.14	2.71	2.41	2.18
T	8	8	3	3	3
N	65	64	60	60	60
O	442	430	177	177	171

Notes:

The figures in parentheses are the estimated standard errors while SE is the estimated standard deviation of the disturbance term, DW is the Durbin-Watson statistics, T is the number of years included in the sample, N is the number of institutions included in the sample, O is the number of observations.

***, **, * denotes significance at the 1%, 5% and 10% levels respectively.

Table 10: BW Ranking and Student Quality

	Dependent Variable			
	gmat	*gpa*	log *prepay*	*workexp*
$rank_{t-1}$	-0.790*** (0.185)	-0.005** (0.002)	-0.004* (0.002)	0.0001 (0.016)
$dum2nd_{t-1}$	-2.56 (2.14)	0.016 (0.023)	0.027** (0.012)	-0.279*** (0.090)
$dum3rd_{t-1}$	-1.21 (2.70)	-0.004 (0.030)	-0.010 (0.066)	-0.252** (0.128)
Lagged Dependent Variable	0.435*** (0.048)	-0.007 (0.068)	-0.547*** (0.120)	0.107 (0.073)
Constant	380.2*** (31.2)	3.38*** (0.226)	16.0*** (1.25)	4.22*** (0.505)
R^2	0.93	0.75	0.86	0.66
SE	9.63	0.063	0.084	0.529
DW	1.90	2.56	1.95	2.16
T	8	5	6	7
N	65	63	58	60
O	431	256	259	277

Notes:

The figures in parentheses are the estimated standard errors while SE is the estimated standard deviation of the disturbance term, DW is the Durbin-Watson statistics, T is the number of years included in the sample, N is the number of institutions included in the sample, O is the number of observations.

***, **, * denotes significance at the 1%, 5% and 10% levels respectively.

Table 11: BW Ranking and School Demography[1]

	Dependent Variable			
	log *enroll*	log *enroll-parttime*	log *parttime*	*age*
$rank_{t-1}$	-0.003 (0.004)	-0.012** (0.005)	0.001 (0.005)	0.016 (0.013)
$dum2nd_{t-1}$	-0.054*** (0.013)	-0.054** (0.026)	-0.165*** (0.062)	-0.260*** (0.077)
$dum3rd_{t-1}$	-0.108*** (0.041)	-0.076* (0.040)	-0.148 (0.113)	-0.322** (0.137)
Lagged Dependent Variable	0.474*** (0.151)	0.482*** (0.119)	0.538*** (0.165)	0.070 (0.076)
Constant	3.48*** (0.917)	3.36*** (0.700)	2.84*** (0.960)	25.1*** (2.01)
R^2	0.95	0.94	0.92	0.69
SE	0.178	0.165	0.322	0.678
DW	2.20	2.24	2.72	2.11
T	8	8	8	8
N	65	65	65	64
O	441	440	440	435

Notes:

The figures in parentheses are the estimated standard errors while SE is the estimated standard deviation of the disturbance term, DW is the Durbin-Watson statistics, T is the number of years included in the sample, N is the number of institutions included in the sample, O is the number of observations.

***, **, * denotes significance at the 1%, 5% and 10% levels respectively.

[1] See next page for the other three variables: *foreign*, *minority* and *women*

Table 11: BW Ranking and School Demography (continued)

	Dependent Variable		
	foreign	*minority*	*women*
$rank_{t-1}$	0.233*** (0.036)	-0.003 (0.084)	-0.256*** (0.052)
$dum2nd_{t-1}$	0.450 (1.09)	1.34 (0.958)	1.66** (0.773)
$dum3rd_{t-1}$	0.099 (1.84)	0.922 (1.20)	1.25* (0.727)
Lagged Dependent Variable	0.274*** (0.075)	0.130** (0.062)	-0.031 (0.084)
Constant	15.5*** (1.95)	7.83*** (1.64)	34.2*** (3.22)
R^2	0.76	0.47	0.56
SE	4.99	3.88	4.07
DW	2.17	2.11	2.13
T	8	7	8
N	65	65	65
O	442	375	442

Notes:

The figures in parentheses are the estimated standard errors while SE is the estimated standard deviation of the disturbance term, DW is the Durbin-Watson statistics, T is the number of years included in the sample, N is the number of institutions included in the sample, O is the number of observations.

***, **, * denotes significance at the 1%, 5% and 10% levels respectively.

Table 12: BW Ranking and Pricing Policies

	Dependent Variable	
	log *tuition*	log *loans*
$rank_{t-1}$	0.001 (0.002)	-0.009*** (0.003)
$dum2nd_{t-1}$	-0.043** (0.017)	-0.122* (0.067)
$dum3rd_{t-1}$	-0.070** (0.030)	-0.348*** (0.124)
Lagged Dependent Variable	0.546*** (0.129)	-0.114 (0.258)
Constant	4.36*** (1.20)	11.3*** (2.58)
R^2	0.93	0.84
SE	0.118	0.239
DW	2.21	2.36
T	8	6
N	64	58
O	440	257

Notes:

The figures in parentheses are the estimated standard errors while SE is the estimated standard deviation of the disturbance term, DW is the Durbin-Watson statistics, T is the number of years included in the sample, N is the number of institutions included in the sample, O is the number of observations.

***, **, * denotes significance at the 1%, 5% and 10% levels respectively.

Table 13: BW Ranking and Placement Success

	Dependent Variable				
	log *meanpay*	log *meanpay*	log *meanpay-prepay*	*jobs*	*offers*
$rank_{t-1}$	0.009*** (0.001)	0.005** (0.002)	0.022*** (0.007)	0.383*** (0.050)	0.003 (0.015)
$dum2nd_{t-1}$	-0.039** (0.016)	-0.030** (0.013)	-0.133*** (0.034)	0.471 (0.413)	0.456*** (0.168)
$dum3rd_{t-1}$	-0.059*** (0.020)	-0.020 (0.017)	0.028 (0.066)	-0.623 (1.03)	0.191 (0.139)
$workexp_{t-1}$	-----	0.021*** (0.006)	-----	-----	-----
Lagged Dependent Variable	0.338*** (0.048)	0.251** (0.102)	0.074 (0.131)	0.013 (0.081)	-0.177* (0.100)
Constant	6.99*** (0.508)	7.91*** (1.07)	8.91*** (1.25)	79.1*** (6.43)	2.55*** (0.341)
R^2	0.90	0.90	0.67	0.74	0.85
SE	0.071	0.058	0.198	5.35	0.413
DW	2.09	2.06	2.03	2.24	2.76
T	8	7	5	6	6
N	65	60	56	60	58
O	431	290	220	298	186

Notes:

The figures in parentheses are the estimated standard errors while SE is the estimated standard deviation of the disturbance term, DW is the Durbin-Watson statistics, T is the number of years included in the sample, N is the number of institutions included in the sample, O is the number of observations.

***, **, * denotes significance at the 1%, 5% and 10% levels respectively.

APPENDIX

Dependent Variable: ACCEPT
Method: Panel Least Squares
Date: 09/18/06 Time: 00:03
Sample (adjusted): 2 9
Cross-sections included: 65
Total panel (unbalanced) observations: 442

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	17.78787	2.870475	6.196840	0.0000
ACCEPT(-1)	0.229097	0.051624	4.437770	0.0000
RANK(-1)	0.388101	0.131625	2.948536	0.0034
DUM2ND(-1)	0.638733	1.576145	0.405250	0.6855
DUM3RD(-1)	1.895374	1.990915	0.952011	0.3417

Effects Specification

Cross-section fixed (dummy variables)
Period fixed (dummy variables)

R-squared	0.786134	Mean dependent var	33.20932
Adjusted R-squared	0.742309	S.D. dependent var	13.98497
S.E. of regression	7.099230	Akaike info criterion	6.913065
Sum squared resid	18446.06	Schwarz criterion	7.616548
Log likelihood	-1451.787	F-statistic	17.93801
Durbin-Watson stat	1.935338	Prob(F-statistic)	0.000000

Dependent Variable: YIELD
Method: Panel Least Squares
Date: 09/18/06 Time: 00:04
Sample (adjusted): 2 9
Cross-sections included: 64
Total panel (unbalanced) observations: 430

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	42.81722	3.863722	11.08186	0.0000
YIELD(-1)	0.208235	0.051243	4.063719	0.0001
RANK(-1)	-0.129928	0.125227	-1.037547	0.3002
DUM2ND(-1)	1.241248	1.480829	0.838211	0.4025
DUM3RD(-1)	2.503885	1.898441	1.318917	0.1880

Effects Specification

Cross-section fixed (dummy variables)
Period fixed (dummy variables)

R-squared	0.689844	Mean dependent var	52.23512
Adjusted R-squared	0.625192	S.D. dependent var	10.84217
S.E. of regression	6.637748	Akaike info criterion	6.780592
Sum squared resid	15641.19	Schwarz criterion	7.489392
Log likelihood	-1382.827	F-statistic	10.67008
Durbin-Watson stat	2.136702	Prob(F-statistic)	0.000000

Dependent Variable: AGE
Method: Panel Least Squares
Date: 09/18/06 Time: 00:15
Sample (adjusted): 2 9
Cross-sections included: 64
Total panel (unbalanced) observations: 435
White cross-section standard errors & covariance (d.f. corrected)

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	25.13724	2.013098	12.48685	0.0000
AGE(-1)	0.070169	0.075658	0.927451	0.3543
RANK(-1)	0.015258	0.013484	1.131603	0.2586
DUM2ND(-1)	-0.259958	0.076505	-3.397927	0.0008
DUM3RD(-1)	-0.322020	0.136866	-2.352815	0.0192

Effects Specification

Cross-section fixed (dummy variables)
Period fixed (dummy variables)

R-squared	0.689491	Mean dependent var	27.15839
Adjusted R-squared	0.625664	S.D. dependent var	1.108365
S.E. of regression	0.678131	Akaike info criterion	2.216632
Sum squared resid	165.5500	Schwarz criterion	2.919278
Log likelihood	-407.1174	F-statistic	10.80253
Durbin-Watson stat	2.116807	Prob(F-statistic)	0.000000

Dependent Variable: LOG(APPLICANT)
Method: Panel Least Squares
Date: 10/12/06 Time: 17:51
Sample (adjusted): 7 9
Cross-sections included: 60
Total panel (unbalanced) observations: 177
White cross-section standard errors & covariance (d.f. corrected)

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	7.535843	1.659845	4.540088	0.0000

LOG(APPLICANT(-1))	0.006748	0.240442	0.028066	0.9777
RANK(-1)	-0.020865	0.004674	-4.463732	0.0000
DUM2ND(-1)	-0.020111	0.017872	-1.125257	0.2629
DUM3RD(-1)	-0.262425	0.046743	-5.614190	0.0000

Effects Specification

Cross-section fixed (dummy variables)
Period fixed (dummy variables)

R-squared	0.972294	Mean dependent var	7.075806
Adjusted R-squared	0.956070	S.D. dependent var	0.902976
S.E. of regression	0.189259	Akaike info criterion	-0.212257
Sum squared resid	3.975909	Schwarz criterion	0.972070
Log likelihood	84.78470	F-statistic	59.92879
Durbin-Watson stat	2.707713	Prob(F-statistic)	0.000000

Dependent Variable: LOG(ENROLL)
Method: Panel Least Squares
Date: 10/12/06 Time: 19:21
Sample (adjusted): 2 9
Cross-sections included: 65
Total panel (unbalanced) observations: 441
White cross-section standard errors & covariance (d.f. corrected)

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	3.476328	0.917083	3.790636	0.0002
LOG(ENROLL(-1))	0.473693	0.150578	3.145830	0.0018
RANK(-1)	-0.002925	0.003740	-0.782051	0.4347
DUM2ND(-1)	-0.054429	0.013132	-4.144797	0.0000
DUM3RD(-1)	-0.107532	0.041160	-2.612540	0.0094

Effects Specification

Cross-section fixed (dummy variables)
Period fixed (dummy variables)

R-squared	0.948082	Mean dependent var	6.421061
Adjusted R-squared	0.937414	S.D. dependent var	0.712252
S.E. of regression	0.178185	Akaike info criterion	-0.456466
Sum squared resid	11.58871	Schwarz criterion	0.248222
Log likelihood	176.6507	F-statistic	88.87151
Durbin-Watson stat	2.199947	Prob(F-statistic)	0.000000

Dependent Variable: LOG(ENROLL-PARTTIME)
Method: Panel Least Squares
Date: 10/12/06 Time: 19:22
Sample (adjusted): 2 9
Cross-sections included: 65
Total panel (unbalanced) observations: 440
White cross-section standard errors & covariance (d.f. corrected)

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	3.361879	0.700177	4.801470	0.0000
LOG(ENROLL(-1)-PARTTIME(-1))	0.481924	0.119012	4.049360	0.0001
RANK(-1)	-0.011992	0.004898	-2.448469	0.0148
DUM2ND(-1)	-0.054369	0.025989	-2.091983	0.0371
DUM3RD(-1)	-0.076497	0.040119	-1.906758	0.0573

Effects Specification

Cross-section fixed (dummy variables)
Period fixed (dummy variables)

R-squared	0.943416	Mean dependent var	5.997176
Adjusted R-squared	0.931757	S.D. dependent var	0.633450
S.E. of regression	0.165479	Akaike info criterion	-0.604116
Sum squared resid	9.967473	Schwarz criterion	0.101781
Log likelihood	208.9055	F-statistic	80.91853
Durbin-Watson stat	2.241591	Prob(F-statistic)	0.000000

Dependent Variable: FOREIGN
Method: Panel Least Squares
Date: 09/18/06 Time: 00:24
Sample (adjusted): 2 9
Cross-sections included: 65
Total panel (unbalanced) observations: 422
White cross-section standard errors & covariance (d.f. corrected)

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	15.52588	1.952719	7.950902	0.0000
FOREIGN(-1)	0.273991	0.075048	3.650858	0.0003
RANK(-1)	0.232659	0.036078	6.448695	0.0000
DUM2ND(-1)	0.449649	1.088124	0.413233	0.6797
DUM3RD(-1)	0.098791	1.837340	0.053768	0.9572

Effects Specification

Cross-section fixed (dummy variables)

Period fixed (dummy variables)

R-squared	0.756962	Mean dependent var	26.82393
Adjusted R-squared	0.704280	S.D. dependent var	9.174674
S.E. of regression	4.989202	Akaike info criterion	6.214052
Sum squared resid	8612.680	Schwarz criterion	6.942536
Log likelihood	-1235.165	F-statistic	14.36858
Durbin-Watson stat	2.174391	Prob(F-statistic)	0.000000

Dependent Variable: GMAT
Method: Panel Least Squares
Date: 09/18/06 Time: 00:25
Sample (adjusted): 2 9
Cross-sections included: 65
Total panel (unbalanced) observations: 431

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	380.2300	31.19849	12.18745	0.0000
GMAT(-1)	0.434807	0.048202	9.020466	0.0000
RANK(-1)	-0.790393	0.184999	-4.272415	0.0000
DUM2ND(-1)	-2.556533	2.144075	-1.192371	0.2339
DUM3RD(-1)	-1.211156	2.703652	-0.447970	0.6544

Effects Specification

Cross-section fixed (dummy variables)
Period fixed (dummy variables)

R-squared	0.929913	Mean dependent var	637.8469
Adjusted R-squared	0.915106	S.D. dependent var	33.04943
S.E. of regression	9.629489	Akaike info criterion	7.526215
Sum squared resid	32918.11	Schwarz criterion	8.243209
Log likelihood	-1545.899	F-statistic	62.80163
Durbin-Watson stat	1.904607	Prob(F-statistic)	0.000000

Dependent Variable: GPA
Method: Panel Least Squares
Date: 09/18/06 Time: 00:26
Sample (adjusted): 2 6
Cross-sections included: 63
Total panel (unbalanced) observations: 256

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	3.378861	0.226018	14.94955	0.0000

GPA(-1)	-0.006866	0.067535	-0.101659	0.9191
RANK(-1)	-0.004975	0.002116	-2.350955	0.0198
DUM2ND(-1)	0.015939	0.023404	0.681015	0.4967
DUM3RD(-1)	-0.004440	0.030486	-0.145627	0.8844

Effects Specification

Cross-section fixed (dummy variables)
Period fixed (dummy variables)

R-squared	0.752189	Mean dependent var	3.276289
Adjusted R-squared	0.658423	S.D. dependent var	0.107739
S.E. of regression	0.062968	Akaike info criterion	-2.462522
Sum squared resid	0.733513	Schwarz criterion	-1.479289
Log likelihood	386.2028	F-statistic	8.021964
Durbin-Watson stat	2.561424	Prob(F-statistic)	0.000000

Dependent Variable: JOBS
Method: Panel Least Squares
Date: 09/18/06 Time: 00:28
Sample (adjusted): 4 9
Cross-sections included: 60
Total panel (unbalanced) observations: 298
White cross-section standard errors & covariance (d.f. corrected)

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	79.11223	6.429599	12.30438	0.0000
JOBS(-1)	0.012940	0.081407	0.158959	0.8738
RANK(-1)	0.383301	0.049848	7.689329	0.0000
DUM2ND(-1)	0.471754	0.412865	1.142635	0.2544
DUM3RD(-1)	-0.622934	1.029266	-0.605221	0.5456

Effects Specification

Cross-section fixed (dummy variables)
Period fixed (dummy variables)

R-squared	0.739304	Mean dependent var	87.90067
Adjusted R-squared	0.661892	S.D. dependent var	9.203959
S.E. of regression	5.351831	Akaike info criterion	6.392470
Sum squared resid	6559.039	Schwarz criterion	7.248509
Log likelihood	-883.4781	F-statistic	9.550260
Durbin-Watson stat	2.242935	Prob(F-statistic)	0.000000

Dependent Variable: LOG(LOANS)
Method: Panel Least Squares
Date: 10/12/06 Time: 19:24
Sample (adjusted): 4 9
Cross-sections included: 58
Total panel (unbalanced) observations: 257
White cross-section standard errors & covariance (d.f. corrected)

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	11.33242	2.583688	4.386141	0.0000
LOG(LOANS(-1))	-0.114460	0.258481	-0.442817	0.6584
RANK(-1)	-0.009488	0.002990	-3.173300	0.0018
DUM2ND(-1)	-0.121840	0.066730	-1.825854	0.0694
DUM3RD(-1)	-0.348418	0.124142	-2.806608	0.0055

Effects Specification

Cross-section fixed (dummy variables)
Period fixed (dummy variables)

R-squared	0.835418	Mean dependent var	9.945666
Adjusted R-squared	0.778248	S.D. dependent var	0.506994
S.E. of regression	0.238746	Akaike info criterion	0.192517
Sum squared resid	10.82995	Schwarz criterion	1.117762
Log likelihood	42.26159	F-statistic	14.61277
Durbin-Watson stat	2.359731	Prob(F-statistic)	0.000000

Dependent Variable: MINORITY
Method: Panel Least Squares
Date: 09/18/06 Time: 00:31
Sample (adjusted): 2 8
Cross-sections included: 65
Total panel (unbalanced) observations: 375

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	7.833218	1.643224	4.766981	0.0000
MINORITY(-1)	0.129471	0.061850	2.093282	0.0372
RANK(-1)	-0.003081	0.083555	-0.036879	0.9706
DUM2ND(-1)	1.341953	0.958018	1.400759	0.1623
DUM3RD(-1)	0.921949	1.204863	0.765190	0.4448

Effects Specification

Cross-section fixed (dummy variables)
Period fixed (dummy variables)

R-squared	0.465373	Mean dependent var	9.711467
Adjusted R-squared	0.333499	S.D. dependent var	4.756549
S.E. of regression	3.883225	Akaike info criterion	5.728065
Sum squared resid	4523.831	Schwarz criterion	6.513451
Log likelihood	-999.0123	F-statistic	3.528907
Durbin-Watson stat	2.110177	Prob(F-statistic)	0.000000

Dependent Variable: LOG(MEANPAY)
Method: Panel Least Squares
Date: 10/12/06 Time: 19:26
Sample (adjusted): 2 9
Cross-sections included: 65
Total panel (unbalanced) observations: 431

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	6.994435	0.508360	13.75883	0.0000
LOG(MEANPAY(-1))	0.338439	0.047895	7.066276	0.0000
RANK(-1)	0.009011	0.001403	6.420510	0.0000
DUM2ND(-1)	-0.038821	0.015956	-2.433019	0.0155
DUM3RD(-1)	-0.059368	0.020381	-2.912905	0.0038

Effects Specification

Cross-section fixed (dummy variables)
Period fixed (dummy variables)

R-squared	0.902006	Mean dependent var	10.78041
Adjusted R-squared	0.881303	S.D. dependent var	0.207273
S.E. of regression	0.071410	Akaike info criterion	-2.282067
Sum squared resid	1.810306	Schwarz criterion	-1.565074
Log likelihood	567.7855	F-statistic	43.56911
Durbin-Watson stat	2.086561	Prob(F-statistic)	0.000000

Dependent Variable: LOG(MEANPAY)
Method: Panel Least Squares
Date: 10/12/06 Time: 19:48
Sample (adjusted): 3 9
Cross-sections included: 60
Total panel (unbalanced) observations: 290
White cross-section standard errors & covariance (d.f. corrected)

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	7.912347	1.071737	7.382736	0.0000

LOG(MEANPAY(-1))	0.251309	0.102139	2.460452	0.0147
WORKEXP(-1)	0.021120	0.006407	3.296645	0.0011
RANK(-1)	0.005229	0.002347	2.228328	0.0269
DUM2ND(-1)	-0.029521	0.012619	-2.339403	0.0202
DUM3RD(-1)	-0.020425	0.016980	-1.202845	0.2303

Effects Specification

Cross-section fixed (dummy variables)
Period fixed (dummy variables)

R-squared	0.902614	Mean dependent var	10.81214
Adjusted R-squared	0.871486	S.D. dependent var	0.160612
S.E. of regression	0.057578	Akaike info criterion	-2.662517
Sum squared resid	0.726027	Schwarz criterion	-1.764029
Log likelihood	457.0650	F-statistic	28.99684
Durbin-Watson stat	2.064501	Prob(F-statistic)	0.000000

Dependent Variable: OFFERS
Method: Panel Least Squares
Date: 09/18/06 Time: 00:35
Sample (adjusted): 4 9
Cross-sections included: 58
Total panel (unbalanced) observations: 186
White period standard errors & covariance (d.f. corrected)

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	2.546860	0.341006	7.468662	0.0000
OFFERS(-1)	-0.177036	0.100210	-1.766652	0.0799
RANK(-1)	0.003324	0.015113	0.219924	0.8263
DUM2ND(-1)	0.456381	0.168461	2.709115	0.0077
DUM3RD(-1)	0.191085	0.138921	1.375495	0.1716

Effects Specification

Cross-section fixed (dummy variables)
Period fixed (dummy variables)

R-squared	0.850022	Mean dependent var	2.253925
Adjusted R-squared	0.766840	S.D. dependent var	0.854985
S.E. of regression	0.412844	Akaike info criterion	1.342311
Sum squared resid	20.28234	Schwarz criterion	2.504273
Log likelihood	-57.83492	F-statistic	10.21890
Durbin-Watson stat	2.757205	Prob(F-statistic)	0.000000

Dependent Variable: LOG(PARTTIME)
Method: Panel Least Squares
Date: 10/12/06 Time: 19:28
Sample (adjusted): 2 9
Cross-sections included: 45
Total panel (unbalanced) observations: 230
White cross-section standard errors & covariance (d.f. corrected)

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	2.840373	0.959620	2.959894	0.0035
LOG(PARTTIME(-1))	0.537544	0.165374	3.250467	0.0014
RANK(-1)	0.001249	0.005165	0.241808	0.8092
DUM2ND(-1)	-0.164947	0.061590	-2.678158	0.0081
DUM3RD(-1)	-0.147629	0.112793	-1.308851	0.1923

Effects Specification

Cross-section fixed (dummy variables)
Period fixed (dummy variables)

R-squared	0.915715	Mean dependent var	5.940856
Adjusted R-squared	0.889073	S.D. dependent var	0.965588
S.E. of regression	0.321596	Akaike info criterion	0.776894
Sum squared resid	17.99582	Schwarz criterion	1.613991
Log likelihood	-33.34277	F-statistic	34.37115
Durbin-Watson stat	2.721379	Prob(F-statistic)	0.000000

Dependent Variable: LOG(PREPAY)
Method: Panel Least Squares
Date: 10/12/06 Time: 19:29
Sample (adjusted): 4 9
Cross-sections included: 58
Total panel (unbalanced) observations: 259
White cross-section standard errors & covariance (d.f. corrected)

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	15.96513	1.245359	12.81970	0.0000
LOG(PREPAY(-1))	-0.546520	0.119969	-4.555512	0.0000
RANK(-1)	-0.003965	0.002301	-1.722794	0.0865
DUM2ND(-1)	0.026762	0.012027	2.225128	0.0272
DUM3RD(-1)	-0.010365	0.065866	-0.157372	0.8751

Effects Specification

Cross-section fixed (dummy variables)

Period fixed (dummy variables)

R-squared	0.857742	Mean dependent var	10.28953
Adjusted R-squared	0.808841	S.D. dependent var	0.192712
S.E. of regression	0.084257	Akaike info criterion	-1.891852
Sum squared resid	1.363050	Schwarz criterion	-0.971745
Log likelihood	311.9948	F-statistic	17.54032
Durbin-Watson stat	1.949092	Prob(F-statistic)	0.000000

Dependent Variable: LOG(MEANPAY-PREPAY(-1))
Method: Panel Least Squares
Date: 10/12/06 Time: 19:32
Sample (adjusted): 5 9
Cross-sections included: 56
Total panel (unbalanced) observations: 220
White cross-section standard errors & covariance (d.f. corrected)

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	8.909385	1.245905	7.150934	0.0000
LOG(MEANPAY(-1)-PREPAY(-2))	0.073603	0.131063	0.561583	0.5752
RANK(-1)	0.021695	0.007116	3.048885	0.0027
DUM2ND(-1)	-0.133290	0.033960	-3.924889	0.0001
DUM3RD(-1)	0.027541	0.065790	0.418627	0.6761

Effects Specification

Cross-section fixed (dummy variables)
Period fixed (dummy variables)

R-squared	0.673733	Mean dependent var	10.00887
Adjusted R-squared	0.541971	S.D. dependent var	0.292193
S.E. of regression	0.197750	Akaike info criterion	-0.165584
Sum squared resid	6.100364	Schwarz criterion	0.821653
Log likelihood	82.21423	F-statistic	5.113268
Durbin-Watson stat	2.026724	Prob(F-statistic)	0.000000

Dependent Variable: LOG(TUITION)
Method: Panel Least Squares
Date: 10/12/06 Time: 19:34
Sample (adjusted): 2 9
Cross-sections included: 64
Total panel (unbalanced) observations: 440
White cross-section standard errors & covariance (d.f. corrected)

Variable	Coefficient	Std. Error	t-Statistic	Prob.

C	4.359030	1.197575	3.639880	0.0003
LOG(TUITION(-1))	0.546199	0.128904	4.237263	0.0000
RANK(-1)	0.000933	0.001639	0.569464	0.5694
DUM2ND(-1)	-0.043402	0.017237	-2.517969	0.0122
DUM3RD(-1)	-0.070448	0.029740	-2.368800	0.0184

Effects Specification

Cross-section fixed (dummy variables)
Period fixed (dummy variables)

R-squared	0.933493	Mean dependent var	9.479827
Adjusted R-squared	0.920009	S.D. dependent var	0.415687
S.E. of regression	0.117567	Akaike info criterion	-1.289580
Sum squared resid	5.045057	Schwarz criterion	-0.592970
Log likelihood	358.7075	F-statistic	69.23137
Durbin-Watson stat	2.213733	Prob(F-statistic)	0.000000

Dependent Variable: WOMEN
Method: Panel Least Squares
Date: 09/18/06 Time: 00:42
Sample (adjusted): 2 9
Cross-sections included: 65
Total panel (unbalanced) observations: 442
White cross-section standard errors & covariance (d.f. corrected)

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	34.15414	3.224526	10.59199	0.0000
WOMEN(-1)	-0.030855	0.083508	-0.369487	0.7120
RANK(-1)	-0.255806	0.051830	-4.935510	0.0000
DUM2ND(-1)	1.664546	0.773001	2.153354	0.0319
DUM3RD(-1)	1.252202	0.726801	1.722896	0.0858

Effects Specification

Cross-section fixed (dummy variables)
Period fixed (dummy variables)

R-squared	0.560326	Mean dependent var	29.25543
Adjusted R-squared	0.470229	S.D. dependent var	5.586287
S.E. of regression	4.065998	Akaike info criterion	5.798410
Sum squared resid	6050.836	Schwarz criterion	6.501894
Log likelihood	-1205.449	F-statistic	6.219144
Durbin-Watson stat	2.131199	Prob(F-statistic)	0.000000

Dependent Variable: WORKEXP
Method: Panel Least Squares
Date: 09/18/06 Time: 00:45
Sample (adjusted): 3 9
Cross-sections included: 60
Total panel (unbalanced) observations: 277
White cross-section standard errors & covariance (d.f. corrected)

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	4.215897	0.504646	8.354168	0.0000
WORKEXP(-1)	0.107444	0.073126	1.469290	0.1433
RANK(-1)	0.000127	0.015502	0.008183	0.9935
DUM2ND(-1)	-0.278837	0.090311	-3.087523	0.0023
DUM3RD(-1)	-0.251901	0.127780	-1.971356	0.0500

Effects Specification

Cross-section fixed (dummy variables)
Period fixed (dummy variables)

R-squared	0.656133	Mean dependent var	4.541913
Adjusted R-squared	0.541511	S.D. dependent var	0.781493
S.E. of regression	0.529163	Akaike info criterion	1.779077
Sum squared resid	57.96282	Schwarz criterion	2.694893
Log likelihood	-176.4021	F-statistic	5.724306
Durbin-Watson stat	2.159713	Prob(F-statistic)	0.000000

Dependent Variable: LOG(APPLICANT*ACCEPT/100)
Method: Panel Least Squares
Date: 10/12/06 Time: 19:35
Sample (adjusted): 7 9
Cross-sections included: 60
Total panel (unbalanced) observations: 177
White cross-section standard errors & covariance (d.f. corrected)

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	5.689459	1.721292	3.305342	0.0013
LOG(APPLICANT(-1)*ACCEPT(-1)/100)	0.085880	0.303274	0.283175	0.7776
RANK(-1)	-0.010946	0.002891	-3.786802	0.0002
DUM2ND(-1)	-0.141685	0.080631	-1.757205	0.0816
DUM3RD(-1)	-0.229394	0.099435	-2.306963	0.0229

Effects Specification

Cross-section fixed (dummy variables)

Period fixed (dummy variables)

R-squared	0.942018	Mean dependent var	5.867235
Adjusted R-squared	0.908065	S.D. dependent var	0.592568
S.E. of regression	0.179672	Akaike info criterion	-0.316227
Sum squared resid	3.583294	Schwarz criterion	0.868100
Log likelihood	93.98613	F-statistic	27.74440
Durbin-Watson stat	2.409677	Prob(F-statistic)	0.000000

Dependent Variable: LOG(APPLICANT*ACCEPT*YIELD/100^2)
Method: Panel Least Squares
Date: 10/12/06 Time: 19:36
Sample (adjusted): 7 9
Cross-sections included: 60
Total panel (unbalanced) observations: 171
White cross-section standard errors & covariance (d.f. corrected)

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	5.268399	1.835620	2.870092	0.0050
LOG(APPLICANT(-1)*ACCEPT(-1)*YIELD(-1)/100^2)	0.039662	0.356004	0.111410	0.9115
RANK(-1)	-0.010944	0.002997	-3.651959	0.0004
DUM2ND(-1)	-0.118108	0.050156	-2.354825	0.0204
DUM3RD(-1)	-0.162960	0.066501	-2.450497	0.0159

Effects Specification

Cross-section fixed (dummy variables)
Period fixed (dummy variables)

R-squared	0.952791	Mean dependent var	5.156589
Adjusted R-squared	0.923566	S.D. dependent var	0.623523
S.E. of regression	0.172384	Akaike info criterion	-0.393962
Sum squared resid	3.120194	Schwarz criterion	0.818610
Log likelihood	99.68372	F-statistic	32.60208
Durbin-Watson stat	2.175472	Prob(F-statistic)	0.000000