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MBA degree

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Measuring the perceived value of an MBA degree*

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Abstract

Using a survey of income expectations I find that MBA students perceive significant income gains from getting an MBA degree. The median Kellogg student expects that the degree will increase his median earnings relative to a situation without a degree in 18, 29 and 40 percent log-points within 1, 5 and 15 years after completion, respectively. The uncertainty of students about their future earnings increases after the completion of the degree, especially for longer horizons. There is substantial heterogeneity in the perception of income gains from the MBA and earnings risk, with declining returns observed for students of higher ability.

Resumen

Utilizando una encuesta de expectativas de ingreso encuentro que los alumnos de programas MBA estiman ganancias significativas de su post-grado académico. El alumno mediano en la Kellogg Business School espera que su post-grado aumente el logaritmo de sus ingresos medianos en 18, 29 y 49 puntos porcentuales, después de 1, 5 y 15 años, respectivamente. La incertidumbre de los alumnos al respecto de sus ingresos futuros aumenta después del post-grado, especialmente para horizontes de tiempo más largos. Existe una heterogeneidad sustancial de las perspectivas de ganancias de ingreso y de su riesgo, con retornos decrecientes para estudiantes de mayor habilidad.

1 Introduction

Labor economists have long focused on the returns to education and the importance of future income expectations for schooling decisions (Willis and Rosen, 1979, Card, 1999). Data collection of students' income expectations is, however, lacking in most empirical studies. In particular, the gains of post-graduate education are still understudied, even as graduate school and advanced business programs are becoming more widespread in the American society. Business schools and their students have a great interest in knowing the career advantages of their degrees in the labor market. It is of great importance to know what expectations these students have for their graduate degrees. In this paper I study in detail the beliefs of MBA students for their earnings after graduation and what they believe would be their earnings path in the hypothetical scenario in which they had never enrolled in a graduate degree program.

For this study I administered a random survey to 64 MBA students of the Kellogg Graduate School of Business. While specific to the Kellogg class, the survey sample is very similar in demographics, academic background, and work experience to what is reported by Business Week in other Top 10 Business Schools. Therefore this similarity allows to view the results of this study as potentially representative of a larger MBA student population. The interview asked students about their expectation of their median earnings profile and a set of 4 other percentiles around their median. This allows to measure both the central expectation of students' labor earnings and its uncertainty. Students were then asked about their expectation for their earnings profile at 1 year, 5 years, and 15 years in the future after their graduation. Furthermore, students were asked about their expectations of their earnings profile both in the case of completing their degree and for the hypothetical scenario in which they had never enrolled in a post-graduate education program. The detailed questions made in this study allow to measure students' expectations both of the short-term gains in earnings from their degree and the increased gains to experience as they age, as well as the perceived risk of students' earnings profile.

Several conclusions are made from this study. The first one is that MBA students are willing to provide accurate answers for their expected income profiles and the uncertainty about their income realizations. Many students incur in significant debt to pay for tuition fees and the years of lost income implied by enrolling in a post-graduate program, therefore their decisions were often

based on a careful analysis of the gains obtained by their degree and the risk surrounding it. Students report their main sources of information about their future income profiles to include past employers, Business Schools' career centers and previous MBA students.

MBA students perceive significant income gains and high returns to work experience from completing their degree. The median Kellogg student expects the degree will increase his median earnings (in log) relative to a situation without degree in 18, 29 and 40 percent, after 1, 5 and 15 years from the completion of the degree, respectively. The estimate of the median return one-year after the graduation is similar to the estimates of Arcidiacono, Cooley and Hussey (2008), who report an average wage (in log) increase of 19.6 percent for men and 16.8 for women studying in Top-10 schools. My study adds more information to the analysis made in Arcidiacono, Cooley and Hussey (2008). In particular, I am able to estimate students' subjective earnings gains for longer horizons than just the years immediately after graduation. Also, I show that there is great heterogeneity in students' expectations. The interquantile range, i.e., the difference between the percentile 25 and the percentile 75 is a good measure for the sample heterogeneity around the median, being robust to outlier observations present in other measures such as the minimum and maximum range. Students' subjective gains of log-income range from 0% at the percentile 25 to as much as 26.2% at the percentile 75. This implies that as much as 25% of the MBA student population expect null or negative income effects one year after graduation compared to the situation in which they had not enrolled. Furthermore, there is substantial heterogeneity in the returns to experience too. Students' expectations of the earnings' gains of a degree relative to a non-enrollment decision range from a percentile 25 of 14.5% to a percentile 75 of 50.4% after 5 years of post-graduation experience. In a period of 15 years after graduation, MBA students expectations of their income gains range from a percentile 25 of 23.5% to a percentile 75 of 56.4%. This implies that students expect their returns to experience to increase substantially after the degree. This result implies that analysis of the gains of post-graduate education decisions must take into account the long-term gains of such programs. I also use a standard OLS regression to show median returns of the MBA degree are decreasing in previous earnings. This result corroborates previous evidence showing expected gains of MBA returns are declining in students' ability (Arcidiacono, Cooley and Hussey, 2008).

The subjective income uncertainty of the Kellogg students is higher under the scenario of

undertaking the MBA than for the hypothetical scenario in which the students had not taken graduate studies, especially for the more distant horizons of income in 5 and 15 years. Studies of workers yearly income using PSID data confirm that there is a strong unit-root component to earnings over the life of each worker (Gourinchas and Parker, 2002). The fact that students' earnings uncertainty increases with the time horizon can therefore be explained by a correct perception that the labor market is influenced by the existence of permanent shocks, with the influence of the permanent shock increasing for longer time horizons. I also show that students with high earnings uncertainty after the MBA graduation believe their earnings would be volatile even if they had never enrolled in a graduate program, showing that some students select into high risk careers.

This work is closely related to other studies of the gains of an MBA degree (Arcidiacono, Cooley and Hussey 2008) and to studies of subjective college returns (Wiswall and Zafar, 2015a), job expectations (Wiswall and Zafar, 2018), and the influence of gender and social motives behind education choices (Eika, Mogstad and Zafar, 2019, Wiswall and Zafar, 2015b, Delavande and Zafar, 2019, Zafar, 2012, 2013). Graddy and Pistaferri (2000), Ray and Jeon (2003) and Tracy and Waldfogel (1997) compared the gains made by MBA students in relation to their previous wages. Montgomery (2002) and Montgomery and Powell (2003) show that MBA female graduates have substantial wage increases relative to similar female workers who did not enroll in MBA programs. However, these studies do not take into account that students choosing not to enroll in an MBA would have benefited from wage growth due to more years of work experience. Arcidiacono, Cooley and Hussey (2008) solved this issue by comparing the earnings of a sample of MBA graduates with a sample of workers who did not enroll in graduate studies as a counterfactual. My study expands upon these results by showing there is a great heterogeneity in the gains students expect from their degree, with many of them actually expecting null income gains. Furthermore, Arcidiacono, Cooley and Hussey (2008) provide no evidence on the positive effect that an MBA degree could have on the returns to experience of the worker. Here I report strong evidence that students expect much larger income gains 5 and 15 years after their graduation, showing it is important to take into account long-term income gains. Also, I show students' earnings distribution is affected by an MBA degree not just in terms of higher median earnings, but also in terms of increased income volatility, which increases over time. This finding is not present in the previous literature, which only measures the mean increase in earnings from a degree. Therefore previous analysis of the income gains of

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an MBA can be deceptive, since the income earnings of a worker with and without a degree are discounted at the same rate and the increased risk of graduates' earnings is not taken into account.

Furthermore, I build on recent literature studying expectation formation (Madeira and Zafar, 2015, Madeira, 2018, Madeira and Madeira, 2019), labor income expectations and the distribution of subjective returns to education, such as Das and Donkers (1997), Dominitz and Manski (1997), Dominitz (1998), and Kaufmann (2008). Of particular interest is Arcidiacono, Hotz and Kang (2010) and Zafar (2011a,b), who find students' expectations of the income of different college majors strongly influence their education choices. Dominitz and Manski (1996) find that a sample of Madison high school and college students expect large income gains at age 30 and 40 from having completed a college degree. Dominitz and Manski also conclude that most students tend to overestimate the current degree of earnings inequality in American society.

This work is organized as follows. Section 2 presents the general structure of the survey and its administration. Section 3 analyses the professional background of our sample of Kellogg students, which seems to be representative of the general Kellogg student body. Section 4 examines respondent's earnings expectations elicited in the survey and which factors explain the heterogeneity in beliefs of Kellogg students. Section 5 presents a summary of our main conclusions and results.

2   Measuring students' subjective earnings expectations

2.1   Survey design

The survey was implemented on a random sample of 64 students from the 960 student population of the MBA program in the Kellogg Business School. The survey was administered in individual interview form to Kellogg students, met inside the Kellogg Business School building in Evanston, during November of 2004. The survey was filled by each student individually in the presence of the author, who provided occasionally some clarification on doubts about the meaning of the questions and posed additional explanations regarding the probabilistic notion of median, in case some inconsistent answer was filled by the respondent. Kellogg students were able to answer the questions in a consistent manner and non-response of most questions administered was low or zero.

Additionally, Kellogg students provided very helpful justifications for their answers and insightful comments regarding the interpretation of the results of the survey.

Most students took 20 minutes or less to complete the 9 pages of the survey. There were few students answering the interview in more than 25 minutes or less than 15 minutes. The questions in the survey were about important facts of the students' life, on which they gave due thought before deciding to go to Kellogg, which may explain their easiness in answering the interview form.

The survey was structured as follows:

1) Background questions: Respondents report on their gender, age, previous education and work experience, last yearly pre-tax work income, GMAT scores, reasons for taking the MBA, and percent chances of doing each field major at Kellogg.

2) Expectations regarding the nature of the 1st job: The second section asks about the percent chance of the most likely country of work, business areas, and job functions of the 1st work obtained by the student after graduation.

3) Earnings expectations under counterfactual scenarios: The third section asks about expectations of future pre-tax work income for 1, 5 and 15 years after the completion of their degree, for both counterfactual scenarios in which they have completed their MBA degree and in which they had followed their regular professional career without any additional post-graduate degree. Expectation answers are expressed in today's dollars since we do not have any interest in students' forecasts of future inflation.

4) Beliefs about last year's income distributions: The survey ends with a 4th section, eliciting students' subjective distributions of work income for past Kellogg students. The students were asked, therefore, some questions regarding their impressions on the earnings performance of the 2003 and 1998 MBA classes during the last year.

2.2 Eliciting the Subjective Earnings Distribution

The probabilistic earnings' questions in the survey were made in % terms of the median. This device was chosen to avoid fixed threshold wage questions since these can lead to anchoring problems and an easy algorithm to choose threshold values for the earnings questions was not available. The chosen fixed % questions were expressed for values of 70%, 90%, 110%, and 130% of their subjective

medians:

1.   In the _ _ _ (given year) year after you finish your MBA degree, what is the MEDIAN amount of (annual) wage earnings that you think you will earn? _ _

2.   What do you think is the percent chance that you will earn _ _ _ _ (given % - 10 or 30%) or more above your MEDIAN wage (that is above or equal to _ _ _ _ _ (110% or 130%) of your predicted MEDIAN income)? _ _ _ _

3.   What do you think is the percent chance that you will earn _ _ _ _ _ _ (given % - 10 or 30%) or more below your MEDIAN wage (that is equal or below _ _ _ _ (90 or 70%) of your predicted MEDIAN income)? _ _ _ _ _ _ _ _ _ _

Similar questions were asked for the hypothetical scenario in which students had decided not to take an MBA at any time in their lives and for the questions eliciting subjective beliefs about the past earnings' performance of Kellogg students in the 2003 and 1998 MBA classes (respectively, the MBA classes that had just entered the job market and the class that was already in the job market 5 years after their graduation). Asking for hypothetical scenarios must involve some care. In this case, the students could be led to reason that, if they were in a scenario where they had decided not to do an MBA and would never take an MBA in the future, it could imply something else was different in the state of the world. Perhaps the decision would be related to a state of the world in which the returns to an MBA would have dropped down. To avoid this problem, the questions in the survey made explicit that nothing else changed in the world, except the fact that they had not taken an MBA. The entire survey and the data file with the individual anonymous answers is available from the author upon request.

Response patterns observed during the interviews indicate that the answers reflected positive and thoughtful content. Most students had, however, some difficulty in expressing their expectations for a distant horizon of 15 years. One of the reasons presented for this difficulty of forecast relates to the great uncertainty presented to any forecast made far into the future. Another difficulty is related to possible career choices that might be made during a 15 year time that can dramatically change the income distribution of each individual. Many male respondents answered that they might decide to create their own firm in 10 or 15 years, which would change completely their earnings' distribution and increase uncertainty. A small number of respondents also added that

they could consider an early retirement around the age of 45 if they had earned enough money by then. Other respondents gave the view that income for an MBA student should be reaching the top around the horizon of 15 years and should stabilize or even start to decline afterwards.

Some female respondents also commented that they could give earnings expectations for the scenario where they would still be working full-time 15 years from now, but warned that due to the possibility of choosing to raise a family there was a significant chance that this scenario might not happen. A few respondents commented that there was a 40 or 50 percent chance that they would not be working full-time in 15 years. These answers seem puzzling, since one would expect women of higher education to have a high degree of commitment to the labor force. One might see this as evidence confirming Louise Story's article in The New York Times about many female students from top colleges expressing preference for family concerns above work attachment.

There were some students presenting inconsistent answers for the probabilistic questions. Most inconsistent answers were related to the percent chance answer given to the probability of having wages above 10% or more or 10% or less than their subjective median wage. Some students gave answers of values of 50% and in excess of 50% to these questions. Most respondents when asked for the motive of this inconsistency explained they had difficulty giving a precise estimate of the median of their future income and so they expressed their answer as a "conservative value" for their future earnings and not what they meant by the median. This explanation fits the pattern of the answers for these respondents, since the percent chance of having wages 10% or more above their "conservative wage" was about 60 or 65%, but the percent chance of having wage 10% or more below their "conservative wage" was around 30% or less. There were, however, 2 students who presented inconsistent answers even under the "conservative value" view. The respondents probably wanted to express that the probability of having values above or below the median was high, but what exactly are their probabilistic values beliefs is hard to interpret.

Table 1: Frequency of values reported for % chance

Bin	Freq.	Freq. %	(w/out 0s)
0	1685	35.50%	NA
1	34	0.70%	1.10%
2	60	1.30%	2.00%
2.5	4	0.10%	0.10%
3	18	0.40%	0.60%
4	3	0.10%	0.10%
5	353	7.40%	11.60%
6	1	0.00%	0.00%
7	11	0.20%	0.40%
8	6	0.10%	0.20%
10	424	8.90%	13.90%
12	2	0.00%	0.10%
14	1	0.00%	0.00%
15	149	3.10%	4.90%
16	1	0.00%	0.00%
17	2	0.00%	0.10%
20	443	9.30%	14.50%
25	159	3.40%	5.20%
26	1	0.00%	0.00%
28	1	0.00%	0.00%
30	328	6.90%	10.70%
33	5	0.10%	0.20%
33.33	1	0.00%	0.00%
34	1	0.00%	0.00%
35	72	1.50%	2.40%
38	2	0.00%	0.10%
39	2	0.00%	0.10%
40	244	5.10%	8.00%

Bin	Freq.	Freq. %	(w/out 0s)
42	1	0.00%	0.00%
45	38	0.80%	1.20%
46	1	0.00%	0.00%
49	8	0.20%	0.30%
50	222	4.70%	7.30%
55	5	0.10%	0.20%
60	47	1.00%	1.50%
65	6	0.10%	0.20%
66.67	3	0.10%	0.10%
70	30	0.60%	1.00%
75	12	0.30%	0.40%
80	73	1.50%	2.40%
84	1	0.00%	0.00%
85	5	0.10%	0.20%
90	34	0.70%	1.10%
95	38	0.80%	1.20%
98	10	0.20%	0.30%
99	12	0.30%	0.40%
99.99	3	0.10%	0.10%
100	179	3.80%	5.90%
Total	4741	100%	100.00%

Table 1 includes all % answers given by the respondents in the survey. 0 was a very prevalent answer to majors, business areas, and job functions the students did not consider for their future, so this value appears much more frequently than the others. The respondents giving 50% as answer explained that a 50% answer involved "lots of uncertainty" or a value close to 50%. Some respondents in fact changed their answers from 50 to 40%. The answers of the respondents in Table 1 show in fact that students tend to use the whole range between 1 and 100%, although there seems to be rounding of 5% for answers between 10 and 40%, and answers between 40 and 50% seem to be rounded to either 40 or 50%. This rounding pattern is similar to the ones found in previous

studies eliciting answers in % form (Dominitz and Manski, 1996).

Besides a few inconsistent probabilistic answers, 2 persons gave inferior values for the median earnings last year of the MBA class of 1998 than for the MBA class of 2003. It is possible that these respondents misunderstood the question, believing that it was asked what the median earnings of the 1998 MBA class were in 1998 and not in 2003. Unfortunately, it is not possible to know exactly what was in the mind of the respondents, but it seems likely that these 2 answers were due to some typo or error.

2.3 Characterizing the Central Tendency and Spread of Expectations

I analyze the median and uncertainty of the students by fitting their answers to a lognormal distribution, in a similar way to previous research using expectations (Dominitz and Manski, 1996, 1997, Manski, 2004). I achieve this by minimizing the sum of square deviations between the cumulative density percent chances of the answers and the lognormal cumulative density percent change given by the parameters. The answers provided by respondents amount to 5 percentiles of their income distribution. Delavande and Rohwedder (2008) and Delavande, Gine, and McKenzie (2011) study how many percentiles are necessary in order to obtain a good estimate of the uncertainty in respondents' subjective expectations and find that 5 intervals provide a good approximation of respondents' uncertainty, as measured by their subjective variance or interquantile-range. Delavande (2008) also shows that parametric distributions can be considered a good approximation to respondents' actual beliefs and to their updating process in a Bayesian framework.

Let $F_{i,k}$ be the elicited cumulative percent chances and $F(Y_{i,k}; m_i, r_i)$ be the fitted probabilities, with $Y_{i,k}$ being the given income value, and m_i and r_i being the fitted median and interquantile ranges. The fitted probabilities are obtained by solving:

1) $\min_{m_i, r_i} \sum_{k=1}^{5} (F(Y_{i,k}; m_i, r_i) - F_{i,k})^2$.

Since some European and Mexican students gave some values in Euros and Pesos, I translated all values to US dollars. The choice of the exchange rate value is not trivial, since some values refer to 2003 and 2002 (values for last working earnings), and other values refer to future dates. I preferred to use an exchange rate of 1.10 US dollars per Euro and 11 Pesos per US dollar, which are

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the average exchange rates for the years 2002, 2003, and the first 3 quarters of 2004, as presented in the website of the Federal Reserve Bank.

Fitted lognormal parameters (median, mean, interquantile range, standard deviation) were computed for all individuals presenting consistent answers. For respondents whose stated median was interpreted as a "conservative value" instead as a real median, the fitted parameters were obtained by using all the answers with the exception of the subjective median percent chance. The fitted distributions can be analyzed in terms of median and interquantile range, or equivalently, in terms of mean or standard deviation. Both interquantile range (IQR) and standard deviation are useful measures of uncertainty. The median and mean are also good measures of the central tendency of the distribution. The fitted medians and means and the fitted IQRs and standard deviations present a high correlation. All median and fitted medians present similar averages and standard deviations and a correlation coefficient superior to 99% (with the exception of the median and fitted median for the 15 year horizon in the scenario of no-degree, which is 96%). I prefer to use the fitted median and interquantile range in my analysis, since these are also the preferred measures used in previous studies (Manski, 2004).

The fitted lognormal medians are all reasonably close to the medians expressed in the survey by the respondents and both variables present a high correlation. Since some of the values stated in the answers for median by the respondents represent in fact a "conservative value", I prefer to use the fitted medians in most of my analysis for a matter of consistency. Also, the fitted medians and IQRs present a better way to compare different students' answers, since they completely summarize a given subjective distribution and are easy to interpret.

Overall, I evaluate the quality of the lognormal fit by calculating the average square deviation of the fitted probabilities from their values and its standard deviation (estimated as the square root of the average square deviation). I present these results in Table 2. Table 2 indicates that on average there is a difference of 5% between the elicited and the fitted probabilities. Some studies of subjective expectations indicate that the amount of rounding error created by respondents' preferences for numbers ending with a 0 or 5 creates a measurement error of 5%. Therefore table 2 indicates that the log-normal distribution is a good fit for the nonparametric probabilities given by the respondents and that differences could be explained by a small amount of measurement error.

Table 2: Deviation of fitted lognormal probabilities from reported values

Distribution	Average Square Deviation	Standard Deviation
MBA (yr1)	0.24%	4.9%
MBA (yr5)	0.33%	5.8%
MBA (yr15)	0.27%	5.2%
No MBA (yr1)	0.21%	4.6%
No MBA (yr5)	0.22%	4.7%
No MBA (yr15)	0.91%	9.5%
MBA class 2003	0.20%	4.4%
MBA class 1998	0.23%	4.8%

Some students (particularly, students with college degrees in Engineering) expressed their belief that the lognormal distribution was a good prior for their expected earnings distributions, and that they would add a bit more probability and asymmetry in the tails to get a more skewed and realistic distribution. This is an interesting line of reasoning, since it shows that some Kellogg students are used to sophisticated probabilistic reasoning.

3 Description of the Kellogg students

3.1 Professional Background and Information sources

The characteristics of the 64 respondents in my sample are fairly similar to the overall population of students at Kellogg business school. The median student's age in my sample is 28 and 90% of the students have age 32 or lower. There are no students younger than 25. Also, the median student has 5 years of previous work experience and worked in 2 or less past job functions, having worked 3 years or less in his last job. This age and work experience is the same as the ones reported for the median student in the Kellogg class of 2005.

Table 3 compares the academic and demographic background of the survey sample of students with the whole class of 2005, showing they are similar in terms of gender, race, foreign status and majors. This similarity between my survey sample and the Kellogg Class of 2005 helps confirm

that our sample does not suffer from selection bias, which could happen from a bad draw in the random selection process. Therefore it is correct to take the results from our sample as being representative of the larger Kellogg class. Furthermore, statistics reported by Business Week on the proportion of foreign students, females, racial minorities, and students' age of other Top 10 Business Schools are very similar. This is a further encouragement for the conclusions taken from our survey sample, since although small and specific to Kellogg Business School it is a sample quite similar in demographics, academic background, and work experience to what one sees in the overall Top 10 Business Schools. Therefore this helps us view the results of this study as potentially applied to a larger MBA student population.

12.5% of the students had already taken a Master degree previous to Kellogg, most of them being in Engineering. All students were previously employed before their MBA (although one student feared he could have lost his job with a significant probability) and expressed subjective probabilities of finishing the MBA degree equal or higher than 95% (with 100% appearing as the most cited percent chance).

Table 3: Demographics and College majors of Survey Sample versus the Class of 2005

	Freq. (sample)	% (sample)	% (Class of 2005, 716 students)
2 year MBA	43	0.68	0.63
1 year MBA	3	0.05	0.11
MMM	16	25.4%	0.14
JD/MBA	1	1.6%	0.02
1st year in MBA	35	0.57	NA
2nd year in MBA	26	0.43	NA
Married	30	0.47	NA
Female students	15	0.23	0.29
Non-White students	15	0.23	0.28
Foreign students	17	0.27	0.27
Econ/Management	22	0.34	0.42
Engineering/Sciences	33	0.52	0.4
Humanities	9	0.14	0.18
Master of Arts or Science	8	12.5%	NA

Table 4: Top Reasons for doing an MBA

Reasons for doing MBA	1st	2nd	3rd	4th	5th	6th
Wage improvement	6.3%	11.3%	34.6%	17.5%	14.3%	0.25
Promotion goals	10.94%	22.6%	16.4%	22.5%	0.2	20.8%
Job change	21.9%	25.8%	9.1%	12.5%	14.3%	0
Desire of new knowledge	46.9%	19.4%	16.4%	0.1	0	0
Personal satisfaction	10.9%	16.1%	21.8%	0.22	0.2	8.3%
Student Life	3.1%	3.2%	1.8%	12.5%	31.4%	41.4%
Other	0	1.6%	0	0	0	4.2%
Nr of answers	64	62	55	40	35	24

Students were asked what were their main reasons for doing an MBA (in decreasing order of importance) and sources of information (yes if used, no if not) for taking their decision. The most important reason for doing an MBA is "Desire of acquiring new knowledge or improving business skills", followed by "Job change" and "Personal satisfaction" (Table 4). Wage improvement seems to be only the 4th main reason students indicate for doing an MBA. Indeed, some students coming from Finance jobs even expect their lifetime earnings profile should decrease with their decision of doing an MBA. This indicates that there is a significant non-pecuniary value from the MBA degree in terms of leisure or personal satisfaction, besides the income gains expected by most students.

Table 5: Sources of Information about the MBA

Sources prior to enrollment	Yes (%)
Work Colleagues	70.3%
Employer	32.8%
Newspapers/ Magazines	59.4%
Past MBA students	0.75
Business Schools' Websites	56.3%
Friends	67.2%
Family	18.8%
Other Websites	20.3%
Other Sources	7.8%

The most widely used information source about the advantages of an MBA degree prior to enrolment was "Work Colleagues" (Table 5), indicating that students searched for information on the job market value of their decision. Other widely used information sources included the Business School Career Centers, Friends, and Newspapers. Curiously, Family was not a widely cited source, confirming our view that decisions were mostly based on professional motives rather than personal ones.

Most students are financing their MBA with a high proportion of debt and personal funds. 52% of the students reported using more than 50% of debt to finance their studies, with 10% actually using more than 90% of debt to pay for their expenses incurred while studying. Personal Savings accounts for at least 27.5% of the expenses for more than 50% of the students. Only 9 students benefited from employer funds for enrolling in the MBA, with 3 students actually getting complete funding from their employers. Employer funding makes it clear that the degree has some professional value for these students.

3.2 Career Prospects after Graduation

It is likely that a big part of the uncertainty about students' earnings concerns their professional career path and their work industry. The survey elicited students' subjective probabilities (percent chance) that they would work in a certain work industry (Table 6), with each student's answers summing up to 100%. The most likely business industry reported by students is Consulting, which coincides with the 34% of students from previous Kellogg classes working in this industry in their first job after graduation. Household Consumer Products, Software, and Pharmaceuticals, are the next largest business industries that students expect to work in, representing close to 30% of their expected choices. Also, the mean student believes he will work in Investment Banking or Investment Management with a 13.9% probability. This means that while the volatility of Finance occupations could represent part of the earnings' uncertainty of some students, it cannot be the major explanation for the earnings uncertainty found across the whole sample.

Table 6: Most likely business areas for MBA students after graduation

Business area of 1st job after graduation	Average Percent Chance
Consulting	32.7%
Investment banking/ brokerage	7.2%
Investment Management	6.7%
Pharmaceuticals/health	8.0%
Household products	9.8%
Food/drinks/tobacco	4.1%
Computers/ software	9.6%
Other manufacturing	8.0%
Unemployed/out of labor market	0.6%
Other	12.9%

Consulting, General Management, and Marketing are the functions Kellogg students expect to fulfill in their first occupation (Table 7). Again, the average student expects to become an investment Banker or Investment Manager with less than 10% of probability, which implies Finance cannot be the major source of volatility behind the earnings' uncertainty reported by students. It is important to note that the proportion of students expecting to work in the Investment Banking/Management industry is not the same as the proportion of students expecting to become Investment Bankers and Managers. This is because students can work in the Finance industry in occupations such as Marketing or General Managers. Therefore not everyone working in the Finance industry actually works as a Banker or Investment Manager. These results are confirmed by the Kellogg Career Center report on the business areas and functions performed in the 1st job after graduation by past MBA classes.

Table 7: Most likely job functions for MBA students after graduation

Function of 1st job after graduation	Average Percent Chance
Business Development	7.8%
Consulting	28.8%
General Management	17.2%
Investment banking	4.3%
Investment Management	5.3%
Other Finance	6.9%
Marketing	18.4%
Strategic planning	7.4%
Operations/ Production	3.8%
Other	0.3%

The United States is the most favored geographical area of work (Table 8), even for foreign students. This implies that most of the uncertainty about the earnings of the MBA students is related to the American labor market and not to foreign countries.

Table 8: Most likely geographical areas for Kellogg students (1st job after degree)

Geographical Area	Average Percent Chance
USA	82.8%
London	4.7%
Home Country (Foreign citizens only)	34%

4 Returns to the MBA: uncertainty and central tendency

4.1 Students' Median earnings expectations

Table 9 shows the percentiles 10, 25, 50, 75 and 90, for the distributions of the last earnings received by the students before enrollment and for their subjective Median earnings after graduation. The reported subjective Median correspond to the fitted log-normal distribution explicit in the previous section and not to the original answers of the students. The distribution of the subjective Median

earnings in the first year after graduation varies between a percentile 10 of 80,000 dollars, a median of 101,300 dollars, and a percentile 90 of 141,600 dollars. It is also clear that students expect their Median earnings to increase 5 and 15 years after their graduation. Furthermore, there is evidence that workers with high returns to experience are selecting into MBA programs. In table 9 I show the subjective Median earnings Kellogg students expected if they had never enrolled. It is clear that students expected their labor earnings to increase even if they had not enrolled in a post-graduate program. In particular, the median student expected his median earnings without a degree would be 179,200 dollars in an horizon of 15 years. These earnings are more than twice the amount of the 75,000 dollars that the median student had as his last earnings, therefore it reveals Kellogg students expect that their earnings would have high returns to experience with or without a post-graduate degree.

Students were also asked about their subjective expectation of the earnings distributions of students from previous classes, in this case, the class of 2003 (meaning students with one year of post-MBA experience) and the class of 1998 (meaning students with 5 years of post-graduation experience). Students' expectations of the earnings faced by the previous Kellogg classes also show that they expect that MBA graduates will be earning more 5 years after graduation, which indicates students believe that higher returns to experience is not a specific characteristic of their career path, but a general feature of MBA graduate classes.

Like most Business Schools, Kellogg implements a survey of its graduating students with the goal of knowing their occupations and first-year professional experience, as well as their starting yearly salaries. These statistics are summarized in the Kellogg Employment Report, easily available for the years 2001-2010 at http://www.kellogg.northwestern.edu/career_employer/Employment_Statistics.aspx. According to Kellogg Employment Report, the previous class of 2004 had a Median Base Salary in the 1st working year of 90,000 dollars (and a mean of 92,000). Business Week data also suggests Kellogg MBAs face a Median Base Salary of 95,000 (and a mean of 98,000) dollars, adding that students should face a Median Earnings bonus of 30 thousand dollars in their first working year. Also, Kellogg reports that the base salaries of each class range from 40 to 160 thousand dollars, with similar results for all classes graduating between 2001 and 2004. Therefore the distribution of subjective median earnings of Kellogg students for one year after their graduation is quite coherent with the earnings distributions of the previous MBA classes.

Table 9: Distribution of Fitted Earnings Expectations (thousands of dollars)

Empirical Percentile	10%	25%	50%	75%	90%
Last Earnings	40	59.8	75	100	120
Median (year1)	80.7	90.4	101.3	122.3	141.6
Median (year5)	121.9	143.7	173.8	219.4	275.6
Median (year15)	148.1	201.5	263.8	433	574.1
Median (yr1) – no degree	59.9	74.5	87.2	110.5	142.7
Median (yr5) – no degree	81.5	97.6	122.9	159.8	213.7
Median (yr15) – no degree	97.9	134.4	179.2	250.2	463.5
Median for Class of 2003	84.9	89	99.5	113.5	123.1
Median for Class of 1998	109.4	130.8	164.6	200.1	248.4

4.2 Students' subjective gains from an MBA degree and returns to experience

Now I show more evidence about students' expected gains from the MBA program in relation to the scenario in which they had never enrolled in a post-graduate program. Table 10 shows the log-earnings growth that students expect with and without a degree. The median MBA student expects his degree will increase his earnings by 18.1% in the first year after graduation. The estimate of the Median return one-year after the graduation is similar to the estimates of Arcidiacono, Cooley and Hussey (2008), who report an average wage increase of 19.6 percent log-points for men and 16.8 for women studying in Top-10 schools.

Table 10: Subjective gains to an MBA degree (log-points)

Empirical Percentile	10%	25%	50%	75%	90%
Log(Median yr1/Median yr1-nodegree)-%	-0.148	0	0.181	0.262	0.419
Log(Median yr5/Median yr5-nodegree)-%	-0.024	0.145	0.288	0.504	0.827
Log(Median yr15/Median yr15-nodegree)-%	0	0.235	0.4	0.564	1.188

There are two main results to be gathered from students' subjective expectations of the income gains of their degree relative to the non-enrollment scenario. The first one is that there is a huge heterogeneity in students' expectations of their gains. As much as 25% of the MBA student

population expect null or negative income effects one year after graduation compared to the situation in which they had not enrolled. Even after 5 and 15 years of post-graduate experience, at least 10% of the students claim to expect no increase in their median earnings for having enrolled in the MBA program. This concludes that at least 10% of the student population is motivated to enroll in the MBA program by non-pecuniary reasons instead of earnings' motives. The second conclusion is that students expect that the MBA results in increased returns to experience after their program. In particular, the median student expects his log-income gains increase from 18.1% after one year of work experience to 28.8% and 40% after respectively 5 and 15 years of work experience. This implies that students believe most of their gains are meant to be made in a long-term career path and not just as a one time increase after graduation. Although there is little data to verify whether the expectations of Kellogg students are indeed met by the labor market, Business Week reports that Kellogg students face wage increases of 79.1% in 10 years relative to their pre-MBA income. In my sample the median student reports a log-ratio of Log(Median Income 5 year after the MBA/Last earnings) of 78%, which is consistent with the Business Week data.

Furthermore, there is considerable heterogeneity in the path of these increased returns to experience after graduation. The interquantile range, i.e., the difference between the percentile 25 and the percentile 75 is a good measure for the sample heterogeneity around the median. This measure is robust to outlier observations present in other measures such as the minimum and maximum range, since it concentrates on variation within the 50% of the population closer to the median. In particular, this measure of dispersion is robust to the existence of less than 25% of outliers in the sample, which is a reasonable assumption. Students' subjective gains of log-income range from 0% at the percentile 25 to as much as 26.2% at the percentile 75. Furthermore, there is substantial heterogeneity in the returns to experience too. Students' expectations of the earnings' gains of a degree relative to a non-enrollment decision range from a percentile 25 of 14.5% to a percentile 75 of 50.4% after 5 years of post-graduation experience. In a period of 15 years after graduation, MBA students expectations of their income gains relative to non-enrollment range from a percentile 25 of 23.5% to a percentile 75 of 56.4%. This implies that students expect their returns to experience will increase substantially after their degree. This is a very important result, since it implies that analysis of the gains of post-graduate education decisions must take into account the long-term gains of such programs.

Arcidiacono, Cooley, and Hussey (2008) show evidence that gains from an MBA degree are declining in the ability of the student. Here I provide further evidence by doing a simple linear regression of the subjective gains from an MBA, measured by the difference of Median earnings with a degree and without a degree. The results show that the gains of an MBA are declining in the value of the students' earnings prior to the degree, even after conditioning on other variables such as a dummy for gender, dummy for an Economics/Business college major, or the minority status of the student. Furthermore, the impact of last earnings on MBA gains is negative both at 1, 5 and 15 years after graduation, although the coefficient is not statistically at the 15 year horizon. This result shows that MBA gains are declining in the ability of prospective students both in the short-term and long-term.

Table 11: Regression of MBA gains (Median earnings with an MBA - Median earnings without a degree), thousands of dollars

Explanatory variables	1st year	5th year	15th year
Last Earnings (tho. of dollars)	-0.68 *	-0.85 *	-1.64
	(0.13)	(0.28)	(1.61)
Female (1 if yes)	-1.73	-24.17	-83.43
	(9.61)	(20.31)	(120.91)
Econ/Manag. college major	-3.77	-0.77	-39.51
(1 if yes)	(8.57)	(19.25)	(109.75)
Non-white (1 if yes)	4.43	21.68	-109.96
	(10.07)	(21.68)	(127.86)
Constant	74.49	62.80	26.35
	(17.20)	(36.73)	(219.58)
Number of observations	58	58	55
Adjusted R2	0.34	0.19	0.02

Robust Standard-errors in parentheses

* Coefficients significant at the 5% level

4.3 Subjective uncertainty of the earnings profile with a degree

Another salient feature of the students' expectations is that there is substantial uncertainty around the earnings students will receive in the future. Table 12 shows the distribution of the subjective Interquantile Range (IQR) of the MBA students, which is given by the difference of the percentile 75 and percentile 25 of the students' subjective earnings distribution. There are clear differences in the earnings' risk perceived by different students. Students' subjective earnings uncertainty in the first year after graduation as measured by IQR changes from a low percentile 10 of 13,500 dollars to a median of 25,100 dollars and a percentile 90 of 50,700 dollars. Also, it is clear that students are more uncertain about their earnings' outcomes in the future. The median student believes his subjective IQR would increase from 25,100 dollars in one-year after graduation to 55,300 dollars five years later and 135,500 dollars in a period of 15 years. The fact that income uncertainty is increasing over time implies that students believe that a large component of their income volatility is composed of permanent shocks and not merely transitory ones. Students also believe that their earnings' uncertainty would increase over time even if they had not enrolled in a graduate program. The median student believes that in the case he had decided not to enroll, his subjective IQR would increase from 17,000 dollars one.

Table 12: Distribution of Subjective Earnings Uncertainty (thousands of dollars)

Empirical Percentile	10%	25%	50%	75%	90%
IQR (year1)	13.5	18.3	25.1	37.9	50.7
IQR (year5)	27	33.9	55.3	81.8	121.6
IQR (year15)	37.2	53.9	135.5	214.5	695.9
IQR (yr1) – no degree	8.2	11.7	17	29.1	44.7
IQR (yr5) – no degree	12.3	16.7	29.1	47.5	91.6
IQR (yr15) – no degree	18.7	27.2	52.3	98	212.7
IQR class 2003	14.9	22	29.6	39.5	60.1
IQR class 1998	22.6	35.2	52.9	87	140.5

Studies of workers yearly income using PSID data confirm that there is a strong unit-root component to earnings over the life of each worker (Gourinchas and Parker, 2002). The fact that

students' earnings uncertainty increases with the time horizon can therefore be explained by a correct perception that the labor market is influenced by both permanent and transitory shocks, with the influence of the permanent shock increasing for longer time horizons. Respondents also believe that the earnings dispersion in the past Kellogg classes of 1998 is bigger than for the class of 2003 (Table 12). This confirms that students do believe that the labor market in general is affected by an accumulation of permanent shocks, which increase workers' income inequality over the years.

Another prominent conclusion from the data is that students expect their income profiles to be more risky with an MBA degree than without one. In Table 13 I show the distribution of students' subjective expectation of their increase in Median earnings after the degree, given by the ratio $\frac{\text{Median-earnings with an MBA}}{\text{Median-earnings without an MBA}}$ for 1, 5, and 15 years after graduation. The median student expects his Median-earnings to increase 19.8%, 33.3%, and 49.1% in 1, 5, and 15 years after his graduation relative to the non-enrollment scenario. However, the median student believes his decision of enrolling in an MBA program will increase his income uncertainty - as measured by the ratio of IQR, $\frac{\text{IQR with an MBA}}{\text{IQR without an MBA}}$ - by 43.1%, 56.5%, and 103.7% in 1, 5, and 15 years after his graduation. This is a remarkable finding and it would be interesting to know what justifies these expectations. Perhaps it is the high risk associated with MBA earnings that leads many prospective workers to avoid enrolling in Business School graduate programs.

#### Table 13: Comparison of the Income profiles with and without an MBA

| Empirical Percentile	10%	25%	50%	75%	90%
Ratio of Median (yr1) w MBA / Median (yr1) w/out MBA	0.863	1	1.198	1.3	1.52
Ratio of Median (yr5) w MBA / Median (yr5) w/out MBA	0.977	1.156	1.333	1.655	2.289
Ratio of Median (yr15) w MBA / Median (yr15) w/out MBA	1	1.264	1.491	1.758	3.281
Ratio of IQR (yr1) w MBA / IQR (yr1) w/out MBA	0.514	0.999	1.431	2.175	4.209
Ratio of IQR (yr5) w MBA / IQR (yr5) w/out MBA	0.941	1.149	1.565	2.482	5.866
Ratio of IQR (yr15) w MBA / IQR (yr15) w/out MBA	0.648	1.043	2.037	3.128	9.341

Again, however, there is a remarkable heterogeneity in students' expectations. While 75% of the students expect that their earnings uncertainty, measured by the ratio of IQR, will increase after the MBA, there is also a margin of at least 10% of the students that believe their income uncertainty will actually decrease due to their MBA enrollment. This is another interesting finding and one that is not present in previous literature which simply measured the income gains of the

MBA as an increase in median earnings (Arcidiacono, Cooley, and Hussey, 2008). The results of Table 13 show that students expect a variety of gains from their MBA degree. Most students expect high gains in median earnings, but also more risk. A few students expect a low increase in Median earnings, but they also expect a decrease in income volatility. If this is indeed the reality of the MBA labor market, then the analysis of the expected gains from an MBA degree explicit in Arcidiacono, Cooley, and Hussey (2008) can be deceptive, since the income earnings of a worker with and without a degree are discounted at the same rate and the increased risk of graduates' earnings is not taken into account.

4.4 Do higher income workers also exhibit higher risk?

It is possible that workers with higher appetite for risk select into occupations with higher earnings volatility. I present evidence of this in Figure 1, which plots the sample distribution of workers' subjective IQR of earnings with and without an MBA within one year of graduation. This figure shows that workers with high IQR of subjective earnings would also have high uncertainty even if they had not enrolled in an MBA degree. The conclusion is similar if one looks at the distribution of IQR of earnings 5 years after graduation (Figure 2) and 15 years after graduation (Figure 3).

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Fig 2: Distribution of Subjective IQRs of earnings with and without MBA in year 5

Fig 3: Distribution of Subjective IQR of earnings with and without MBA in year 15
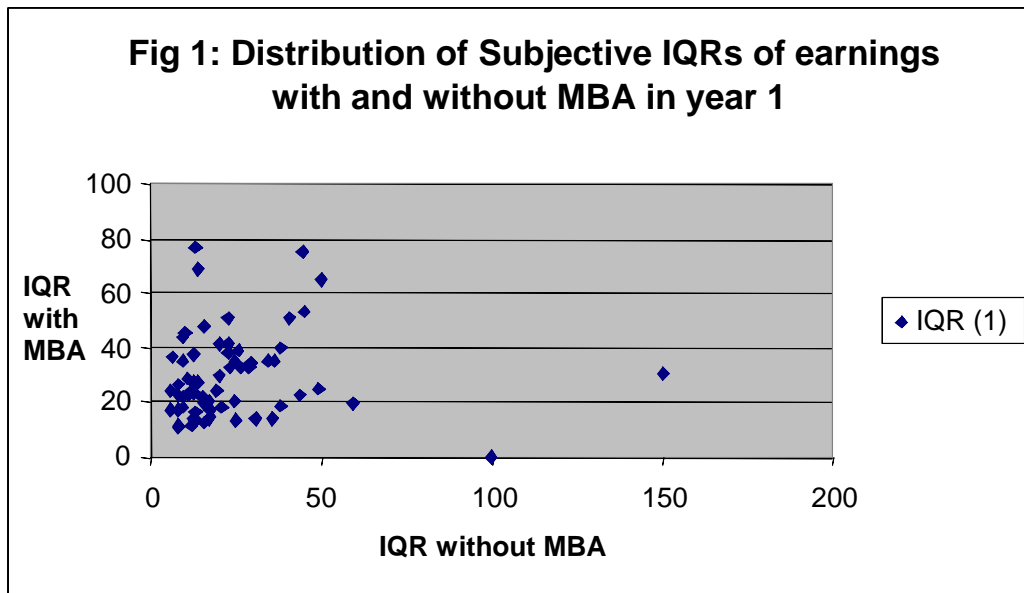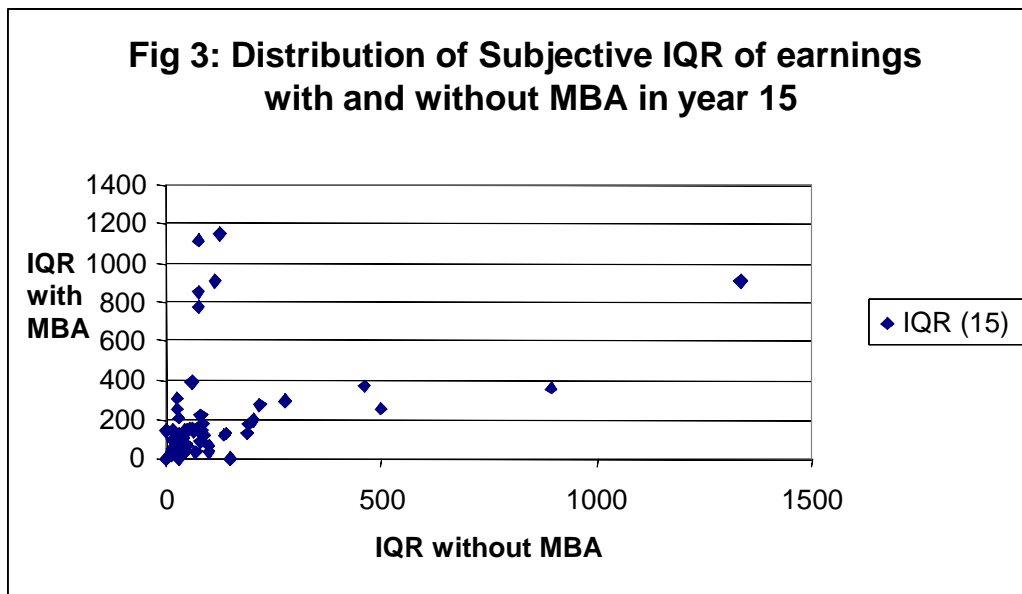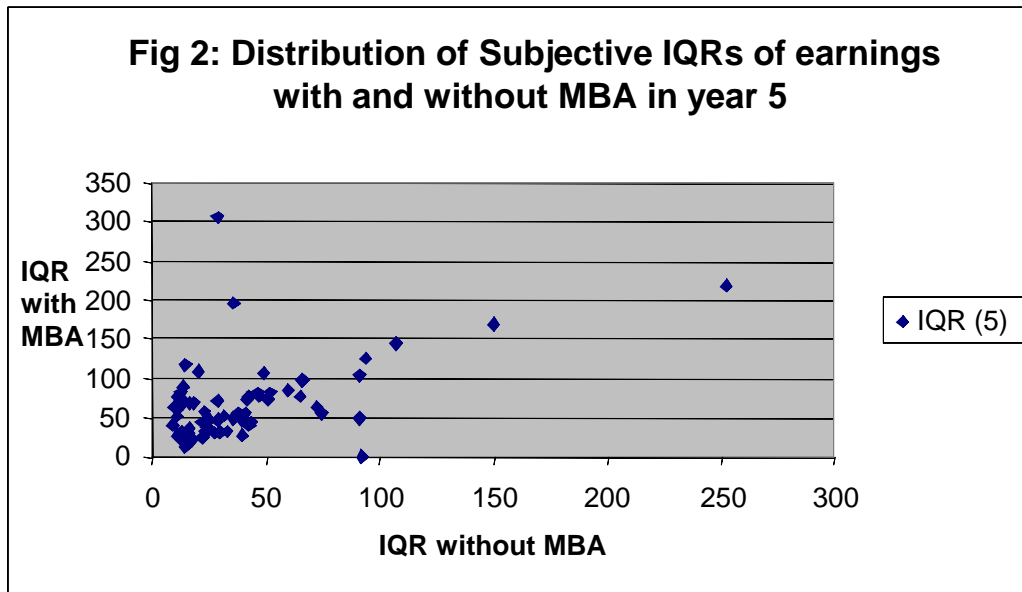
I show further evidence of this in Table 14, which shows the correlation coefficients of the last earnings with the subjective IQR of earnings that students expect in the future either if they have or do not have an MBA degree. Again, Table 14 confirms that the IQR of earnings with and without an MBA are positively and significantly correlated. Furthermore, one would expect that students is riskier occupations would have on average higher values of earnings prior to enrolling in the program. Table 14 shows that earnings prior to enrollment are significantly correlated

with the IQR earnings uncertainty in the scenario students had not enrolled in an MBA program. Although there is a positive correlation between last earnings and the IQR range that students expect after MBA graduation, these coefficients are not statistically significant. One would expect these coefficients to be less significant, however, since many students change their career path after enrolling in an MBA program.

The most salient feature of the distribution of subjective IQR of earnings with and without an MBA is that they are all positive and significantly correlated. This is strong evidence that students selecting into risky careers after their MBA program would also have selected into risky careers even if they had not enrolled in a graduate program.

Table 14: Correlation Coefficient Matrix

Variables	last wage	IQR yr1	IQR yr5	IQR yr15
last earnings	1			
IQR yr1	0.20	1		
IQR yr5	0.19	0.52 **	1	
IQR yr15	0.09	0.24 **	0.50 **	1
IQR nodegree yr1	0.54 **	0.17 **	0.30 **	0.06
IQR nodegree yr5	0.46 **	0.18 **	0.52 **	0.47 **
IQR nodegree yr15	0.24 **	0.01	0.39 **	0.39 **
IQR class of 03	0.01	0.38 **	0.28 **	0.33 **
IQR class of 98	0.01	0.23 **	0.37 **	0.60 **

** Coefficients significant at the 10% level

The subjective IQRs for the future earnings with and without an MBA degree of each respondent are also highly correlated with their subjective beliefs about dispersion of incomes in the MBA classes of 2003 and 1998. This lends support to the hypothesis that persons who believe in a high own subjective income dispersion also believe the labor market has a high dispersion in the earnings distribution.

5 Conclusions

Using a survey of income expectations of Kellogg MBA students I draw several conclusions about the gains students believe they will get from their degree. MBA students perceive significant future income gains of getting an MBA degree and that these gains increase with time. The median Kellogg student expects the degree will increase his median earnings relative to a situation without degree in 18, 29 and 40 percent log-points, for 1, 5 and 15 years after the completion of the degree, respectively. Respondents, therefore, expect that the MBA degree will increase their returns to work experience. Furthermore, expected returns to an MBA degree are smaller for students of higher ability (as measured by previous earnings).

Second, I show that there is huge heterogeneity in students' expectations of their income gains. Students' subjective gains of log-income range from 0% at the percentile 25 to as much as 26.2% at the percentile 75. This implies that as much as 25% of the MBA student population expect null or negative income effects one year after graduation compared to the situation in which they had not enrolled. Even after 15 years around 10% of the student population expect no income gains from their degree.

Finally, the third most relevant conclusion is that most students expect their income profile to have more uncertainty with an MBA than without a graduate degree, especially in the long-term horizons of 5 and 15 years' time. The median student expects his earnings' uncertainty to increase by 43.1%, 56.5%, and 103.7% in 1, 5, and 15 years after his graduation. Therefore the increased income gains of MBA degrees are also partially justified by the negative downside of occupations with higher risk.

These three results have implications for the analysis of the income gains of an MBA program. Previous analysis of the benefits of MBA programs did not take into account increased returns to experience, heterogeneity in students' gains, or the increased risk of their income profile after the MBA degree. My work shows these three elements are relevant in students' expectations of their income gains and therefore careful analysis of the benefits and costs of such programs should take these three factors into account.

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6 Appendix: Questions for the Survey of Lifetime Expectations

Survey of Lifetime Income Expectations

This questionnaire is intended to assess your expectations of future income and the importance of your MBA in achieving higher levels of income and success in the course of your lifetime.

I. Personal Data

The first questions are intended to characterize your background and your past professional and educational achievements. Place an X or a number over the appropriate space in each question.

General Background

1. Gender: Male_ _ _   Female_ _ _

2. Age: _ _ _ _

3. Country of Citizenship: _

4. Number of Years in the USA (if not a US citizen) _ _ _ _ _ _ _ _ _ _ _ _ _ _ _ _

5. Race   Native American_ _ _   White_ _ _   Black_ _ _   Hispanic_ _   Asian_ _ _

6. Family Status   Married_ _   Single_ _ _   Widowed/ Divorced_ _ _

7. Number of Children _ _ _ _ _

Educational and Professional Background

1. Field Area of BA (BS) – if more than one major, signal all the majors that apply

Economics_ _ _ _   Math_ _ _ _   Engineering_ _   Management_ _ _ _ _

Marketing_ _ _ _ _   Finance_ _ _   Law_ _ _ _ _ _ _ _   Communication_ _ _

Physics_ _   Chemistry_ _   Biology_ _ _ _ _ _   Psychology_ _ _ _ _ _

Other Medical Sciences_ _ _ _   History_ _ _ _ _   Information/Technology_ _

Accounting_ _   Other Social Sciences_ _   Other Sciences_ _ _ _ _

2. Other Degrees (MA, MS)   Yes_ _ _   No_ _ _

3. Number of years working (after college) _ _ _ _ _ _

4. Number of full-time jobs taken in this period _ _ _ _ _

5. Number of years spent in the last full-time job/company _ _ _ _ _ _

6. Business Area of your last job

Consulting_ _ _ _   Manufacturing _ _ _   Telecommunications_ _ _   Law_ _ _

Accounting_ _ _   Investment banking_ _ _   Commercial Banking_ _

Fund Management_ _ _   Financial Trading_ _   Pharmaceutical Industry_ _ _

Hospital/Medical_ _ _ _   Human Resources_ _ _   Information/Technology_ _

Government _ _ _ _   Other_ _ _ _

7.   International Experience (number of foreign business trips made) _ _ _ _

8.   Working Status previously to joining the MBA

Employed _ _ _   School_ _ Unemployed _ _ _ Ill / Out of the Labor Force _ _ _

9.   Last full-time working year before-tax work-income (annual) _ _ _ _ _ _ _ _ _ _ _ _ _ _ _

(state wage in a different currency than the dollar, if working outside the USA – include work

bonus in your income)

MBA Details

1. Year in the MBA   1st_ _ _   2nd _ _ _   Other_ _ _

2. GMAT Score   _ _ _ _

3. Reasons for taking the MBA (if more than one motive: mark them in decreasing relevance

order from 1 to 6)

Wage improvement _ _ _   Promotion goals_ _ _   Job change _ _ _

Desire of acquiring new knowledge or improving business skills _ _

Personal Satisfaction_ _   Student Life _ _ _   Other (specify) _ _ _

4. Sources of Information about advantages of taking an MBA and program quality (mark all

that apply)

Work Colleagues _ _ _   Employer_ _   Newspapers/ Magazines _ _ _

Past MBA students _ _   Business Schools' Websites _ _ _

Friends _ _ _   Family_ _

Other Websites_ _ _ _ _   Other Sources_ _ _

5. Financing Method of the MBA (mark % contribution of each source if using more than one

– values should add up to 100%)

Personal Funds_ _ _ _   Family Funds_ _ _ _   Debt_ _ _

Employer's funds_ _   Scholar Grant _ _ _

6. Student Status: Full-Time _ _ _ _   Part-Time_ _ _ _ _ _

2-Year MBA __   1-Year MBA___   Executive___

MMM _____   JD/MBA_____   JM/MBA___

7. Number of years until completion of the MBA   _____

Now, I will ask you some questions about future, uncertain outcomes. In each case, try to think about the whole range of possible outcomes and think about how likely they are to occur in the future. In some of the questions, I will ask you about the PERCENT CHANCE of something happening. The percent chance must be a number between 0 and 100%. Numbers like 2 or 5 % may be "almost no chance", 20 % or so may mean "not much chance", a 45 or 55 % chance may be a "pretty even chance", 80 % or so may mean a "very good chance", and a 95 or 98% chance may be "almost certain". 100% means something that will happen for sure. The PERCENT CHANCE can also be thought of as the NUMBER OF CHANCES OUT OF 100.

8. Let's start with the weather where you live. What do you think is the PERCENT CHANCE (or CHANCES OUT OF 100) that it will rain or snow tomorrow? _____

9. What do you think is the percent chance that you will finish your MBA? _____

10. What do you think is the percent chance that you will major in each of the following fields?

Finance___   Marketing____   Decision Sciences___ Accounting___

Strategy___   Organization__   Consulting ____   Innovation____

International Bus. ____ Business and the environment___   Other majors____

Other Remarks:

II.   Income Expectations Questions

Now try to look ahead about your professional life expectations. Ignore inflation and tax effects. State your answers in real terms (that is, one dollar in the future is the same as one dollar now) and in earnings before taxes and deductions. You should include bonus and other sources of income from your work. You can denominate your expectations in a non-dollar currency if you will be working outside the USA.

II - A

Suppose now that you have finished your MBA degree and go to the job market.

1. What do you think is the percent chance that you will be working in each of the following areas?

Consulting_ _ _ _   Investment banking/ brokerage _ _ _   Investment Management_ _ _

Pharmaceuticals/health _ _ _   Household products_ _ _ Food/drinks/tobacco_ _ _ _

Computers/ software_ _ Other manufacturing_ _ Unemployed/out of labor market_ _

(Note: The probabilities or percent chances should add up to 100 % or less.)

2. What do you think is the percent chance that you will be working in the following functions?

Bus. Development _ _ _   Consulting _ _ _   General Management _ _ _ _ _

Investment banking _ _   Inv. Management _ _ _   Other Finance _ _ _ _ _ _

Marketing _ _ _   Strategic planning _ _ _   Operations/ Production _ _ _

(Note: The probabilities or percent chances should add up to 100 % or less.)

3. What do you think is the percent chance that you will be working in the USA? _ _ _ _ _ _ _ _ _

4. What do you think is the percent chance that you will be working in London? _ _ _ _ _ _ _ _ _ _

5. What do you think is the percent chance that you will be working in your home country (if not the USA)? _ _ _ _ _ _

(Note: The probabilities or percent chances of questions 3-5 should add up to 100% or less.)

II - B

We will be asking you about the MEDIAN AMOUNT of money that you think you will earn at some time in the future. The MEDIAN is the amount of money for which there is a 50% chance that you will earn more than it and 50% chance that you will earn less than it. So, to answer the next set of questions you should try to pick the amount of money that you think there is just as good a chance that you will earn more than it as less than it.

Now assume you that you finished your MBA and got a full time job. You will always find full-time work during the rest of your working life, although you might change your job (for any reason – professional or personal) during this period.

1st year after your MBA graduation

4.   In the first year after you finish your MBA degree, what is the MEDIAN amount of (annual) wage earnings that you think you will earn? _

5.   What do you think is the percent chance that you will earn 10% or more above your MEDIAN wage (that is above or equal to 110% of your predicted MEDIAN income)? ____

6.   What do you think is the percent chance that you will earn 30% or more above your MEDIAN wage (that is above or equal to 130% of your predicted MEDIAN income)? ____

Note: your answer to question 3 must be smaller or equal than your answer to question 2.

7.   What do you think is the percent chance that you will earn 10% or more below your MEDIAN wage (that is equal or below 90% of your predicted MEDIAN income)? _____

8.   What do you think is the percent chance that you will earn 30% or more below your MEDIAN wage (that is below 70% of your predicted MEDIAN income)? _____

Note: your answer to question 5 must be smaller or equal than your answer to question 4.

5 years after your MBA graduation

9.   What is the MEDIAN amount of (annual) wage earnings that you think you will earn? _____

10.   What do you think is the percent chance that you will earn 10% or more above your MEDIAN wage (that is above or equal to 110% of your predicted MEDIAN income)? ____

11.   What do you think is the percent chance that you will earn 30% or more above your MEDIAN wage (that is above or equal to 130% of your predicted MEDIAN income)? ____

Note: your answer to question 8 must be smaller or equal than your answer to question 7.

12.   What do you think is the percent chance that you will earn 10% or more below your MEDIAN wage (that is equal or below 90% of your predicted MEDIAN income)? _____

13.   What do you think is the percent chance that you will earn 30% or more below your MEDIAN wage (that is below 70% of your predicted MEDIAN income)? _____

Note: your answer to question 10 must be smaller or equal than your answer to question 9.

15 years after your MBA graduation

14.   What is the MEDIAN amount of (annual) wage earnings that you think you will earn? _____

15.   What do you think is the percent chance that you will earn 10% or more above your MEDIAN wage (that is above or equal to 110% of your predicted MEDIAN income)? ____

16.   What do you think is the percent chance that you will earn 30% or more above your MEDIAN wage (that is above or equal to 130% of your predicted MEDIAN income)? ____

Note: your answer to question 13 must be smaller or equal than your answer to question 12.

17. What do you think is the percent chance that you will earn 10% or more below your MEDIAN wage (that is equal or below 90% of your predicted MEDIAN income)? _ _ _ _ _ _

18. What do you think is the percent chance that you will earn 30% or more below your MEDIAN wage (that is below 70% of your predicted MEDIAN income)? _ _ _ _ _ _ _ _ _ _ _ _

Note: your answer to question 15 must be smaller or equal than your answer to question 14.

II -C

Now, suppose you had decided not to do an MBA or any other graduate program and had continued on the job market.

Assume also that nothing else changed in the world besides your decision: that is the decision you made was not based on some professional or personal outcome that could have any influence on your future wage.

You will always find full-time work during the rest of your working life, although you might change your job (for any reason – professional or personal) during this period.

Put yourself now in the year equivalent to the first year after your expected completion of the MBA in the preceding questions. Answer all the following questions in the hypothetical scenario that you will never take an MBA.

Year equivalent to 1st year after completing your MBA

1. In the first year, what is the MEDIAN amount of (annual) wage earnings that you think you would earn? _

2. What do you think is the percent chance that you would earn 10% or more above your MEDIAN wage (that is above or equal to 110% of your predicted MEDIAN income)? _ _ _

3. What do you think is the percent chance that you would earn 30% or more above your MEDIAN wage (that is above or equal to 130% of your predicted MEDIAN income)? _ _ _

Note: your answer to question 3 must be smaller or equal than your answer to question 2.

4. What do you think is the percent chance that you would earn 10% or more below your MEDIAN wage (that is equal or below 90% of your predicted MEDIAN income)? _ _ _ _ _

5. What do you think is the percent chance that you would earn 30% or more below your MEDIAN wage (that is below 70% of your predicted MEDIAN income)? _ _ _ _ _ _ _ _ _ _ _

Note: your answer to question 5 must be smaller or equal than your answer to question 4.

Year equivalent to 5th year after completing your MBA

6.   What is the MEDIAN amount of (annual) wage earnings that you think you would earn?

_____

7.   What do you think is the percent chance that you would earn 10% or more above your MEDIAN wage (that is above or equal to 110% of your predicted MEDIAN income)? __

8.   What do you think is the percent chance that you would earn 30% or more above your MEDIAN wage (that is above or equal to 130% of your predicted MEDIAN income)? __

Note: your answer to question 8 must be smaller or equal than your answer to question 7.

9.   What do you think is the percent chance that you would earn 10% or more below your MEDIAN wage (that is equal or below 90% of your predicted MEDIAN income)? ____

10.   What do you think is the percent chance that you would earn 30% or more below your MEDIAN wage (that is below 70% of your predicted MEDIAN income)? _____

Note: your answer to question 10 must be smaller or equal than your answer to question 9.

Year equivalent to 15th year after completing your MBA

11.   What is the MEDIAN amount of (annual) wage earnings that you think you would earn?

_____

12.   What do you think is the percent chance that you would earn 10% or more above your MEDIAN wage (that is above or equal to 110% of your predicted MEDIAN income)? __

13.   What do you think is the percent chance that you would earn 30% or more above your MEDIAN wage (that is above or equal to 130% of your predicted MEDIAN income)? __

Note: your answer to question 13 must be smaller or equal than your answer to question 12.

14.   What do you think is the percent chance that you would earn 10% or more below your MEDIAN wage (that is equal or below 90% of your predicted MEDIAN income)? ____

15.   What do you think is the percent chance that you would earn 30% or more below your MEDIAN wage (that is below 70% of your predicted MEDIAN income)? _____

Note: your answer to question 15 must be smaller or equal than your answer to question 14.

III. Current Job Market

Think about the past Kellogg MBA students and their wage earnings before taxes and deductions,

including bonus and other sources of work income.

For the last MBA class (that is 2003 Kellogg MBA students):

1.   What do you think is the MEDIAN (annual) wage earnings that the 2003 Kellogg students earned last year (2003/04)? _____

2.   What do you think is the percent chance that a 2003 Kellogg MBA student earned 10% or more above the MEDIAN student wage (that is above or equal to 110% of the MEDIAN student income)? _____

3.   What do you think is the percent chance that a 2003 Kellogg MBA student earned 30% or more above the MEDIAN student wage (that is above or equal to 130% of the MEDIAN student income)? _____

4.   What do you think is the percent chance that a 2003 Kellogg MBA student earned 10% or more below the MEDIAN student wage (that is equal or below to 90% of the MEDIAN student income)? _____

5.   What do you think is the percent chance that a 2003 Kellogg MBA student earned 30% or more below the MEDIAN student wage (that is equal or below to 70% of the MEDIAN student income)? _____

Now think about the 1998 Kellogg MBA class (that is the class that completed the MBA 6 years ago) and about the wages they earned in the year 2003/04 (5 years after they have completed their degree):

6.   What do you think is the MEDIAN (annual) wage earnings that the 1998 Kellogg students earned last year (2003/04)? _____

7.   What do you think is the percent chance that a 1998 Kellogg MBA student earned 10% or more above the MEDIAN student wage (that is above or equal to 110% of the MEDIAN student income)? _____

8.   What do you think is the percent chance that a 1998 Kellogg MBA student earned 30% or more above the MEDIAN student wage (that is above or equal to 130% of the MEDIAN student income)? _____

9.   What do you think is the percent chance that a 1998 Kellogg MBA student earned 10% or more below the MEDIAN student wage (that is equal or below to 90% of the MEDIAN student income)? _____

10.   What do you think is the percent chance that a 1998 Kellogg MBA student earned 30% or more below the MEDIAN student wage (that is equal or below to 70% of the MEDIAN student income)? _ _ _ _ _ _ _ _ _ _ _ _ _ _ _ _

(Note: The probabilities or percent chance answers to the questions asking for values above (below) 30% of the median should be smaller than the respective probabilities or percent chance values given for the values above (below) 10% of the median.)

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