

MBAs for Medical Physicists
Talk Summary from AAPM 2014, Austin

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Abstract (from AAPM meeting program)

Medical physicists who are interested in business management, operations, and/or finance are likely to have considered earning an MBA. This session will

1. compare and contrast business education with medical and scientific education,
2. summarize the history and curriculum of the MBA and alternative degrees/certificates,
3. survey current MBA programs, including those likely to be of particular interest to medical physicists,
4. describe the MBA admissions process and student experience, and
5. enumerate ways in which the pursuit and completion of an MBA could impact the career paths of medical physicists.

Learning Objectives (from AAPM meeting program)

1. To understand broadly the organization of, and stakeholders in, business education.
2. To learn about the business school admissions process, curriculum, and student experience.
3. To gain a sense of possible career outcomes that business credentials could catalyze.

Motivation: why an MBA?

- Labor market signaling (Spence 1973)
 - Adverse Selection
 - * Information asymmetry: employers vs. applicants
 - Applicants know better their own abilities
 - Low-ability applicants try to pose as high-ability
 - Analogous to the used-car market (Akerlof 1970)
 - Signals (Education)
 - * If education is *more costly* for low-ability people than for high-ability people,
 1. Employers perceive that better educated applicants are more productive, so pay more \$
 2. High-ability people see the salary gap and elect to invest more \$ in education
 3. Low-ability people view additional education as being irrationally costly to pursue
- Complimentary signals
 - MBA: extroverted, practical, broad knowledge, worldly, persuasive, team-centered
 - PhD: introverted, theoretical, deep knowledge, critical, analytical, individualistic
- Education across fields
 - MBA: student pays, jobs for grads but not necessarily paying better than MP, school name does matter, not unusual for age 35+ students, faculty must publish, ideal motivation: to enable
 - PhD: university pays, general disconnect between supply and demand, school name matters, rare to see older students, faculty must publish, ideal motivation: to discover
 - MD: student pays, annuity income more or less guaranteed after qualifying, school name matters less than certification, rare to see older students, faculty must publish, ideal motivation: to heal

Which Credential?

- MBA
 - 85% of all business masters'
 - generalist, broad degree
 - B-school coursework
 - * Quantitative: Probability, Statistics, Spreadsheets
 - * Economics: Micro, Macro, Game Theory, Strategy
 - * Accounting: Financial, Tax, Managerial
 - * Finance: Investments, Corporate Finance
 - * Operations: Queueing, Inventory Management
 - * Marketing: Consumer Behavior and Research
 - * Management: Leadership, Negotiation, Politics, HR
- MFin, MFE, MMgmt, etc.
 - Subset/refocused MBAs – akin to MBA majors or focus areas
 - MFE typically sub-specializes in derivatives (options pricing)
- Exam-based Professional Credentials
 - Examples: CFA designation (investment management), PMP (project management), many others
 - Registration for CFA exams: college degree required but no work experience – becomes an option for MPs
 - Larger debate: education (change the way you think) vs. certification (demonstrate that you have knowledge)
- MP production in perspective
 - In 2011, for every new DABR physicist, there were:
 - 8 new PhD physicists
 - 9 new MS physicists
 - 11 new B-school PhDs
 - 57 new CFA charterholders

- 83 new MDs
- 219 new JDs
- 921 new MBA/MFin/MFE/MMgmt graduates

Which Program?

- MBA program types
 - Full-Time: student age typically 24-28, must quit job, 22-month program (12 in Europe), classes typically M-Th 9-4, summer internship is standard between years 1 and 2, fixed cohort in year 1 only (core courses), some industry switching
 - Part-Time: student age typically 25-33, students typically have a day job, typically takes 3+ years to finish, classes typically weekday evenings, features scheduling flexibility, no fixed cohort, unusual for students to switch industries
 - Executive: a type of part-time program, typical student age 35-45, usually a concurrent work requirement, program length typically about 22 months, classes on alternate weekends, rough edges of student life smoothed out, like catered meals/snacks on class days, rare to see industry switching due to higher incoming salaries of students
 - Online: concept is in early stages, elite B-schools are looking carefully at this market and if they enter, the market value of non-elite online MBAs is likely to drop; B-school ranking is still very important, online or not; would be very cautious with online MBAs as of 2014
- MBA Market Segments (US)
 - Low Cost: about 350 B-schools, typical all-in total tuition \$40k, local selectivity, faculty quality, and career impact
 - Midmarket: about 100 B-schools, typical all-in total tuition \$100k, regional selectivity, faculty quality, and career impact
 - Elite: about 10 B-schools, typical all-in total tuition \$160k, national/international selectivity, faculty quality, and career impact
 - Many providers of annual B-school rankings
 - Add about \$20k to the above for executive programs

The B-school executive program experience

- Before Day 1
 - Must-do: family support, employer support, visit programs in person
 - Admissions
 - * GMAT/GRE, recommendations, transcripts, essays. Round 2: live interviews
 - * Executive programs have later deadlines than full-time – plan ahead
 - Financial considerations
 - * Company sponsorship is no longer the norm; expect strings attached if help is offered
 - * Tax (US) considerations: see IRS Publication 970
 - * Loans: even with MP salaries, high tuition means possible qualification for some sort of federal aid (like interest-deferred loans); file FAFSA
- First 6 Months
 - Exciting times, high expectations
 - Surprisingly high number of job promotions fairly soon into program
 - Logistics shock (esp. if flying); workload shock for everyone
- Next 16 Months
 - novelty, confidence boost -> workload grind
 - Having engaging, insightful and kind professors really matters at this stage
 - Independent research projects
- Student perks
 - Library/journal access
 - Business-related datasets

Switching industries

- For MPs, the expected opportunity cost of switching industries is high due to being paid reasonably well within MP
- Portable skills will drive up your value outside MP
 - Programming, data analysis, statistical modeling, IT and networking, constant learning, communication and managerial skills
 - Hal Varian, Chief Economist at Google: “I keep saying the sexy job in the next ten years will be statisticians. People think I’m joking, but who would’ve guessed that computer engineers would’ve been the sexy job of the 1990s?”
- Google Scholar
 - Field-agnostic personal publication bibliographies
 - Your past publication record moves with you, forever
 - Also great for people with frequently occurring names

Summary – Is the MBA worth getting?

- A reasonable definition of MBA success
 1. Professional: at least 1 major promotion / better job within 1 year of graduation
 2. Financial: tuition recovery (breakeven) from higher compensation, within 5 years of graduation
 3. Educational: framework fluency with a wide range of managerial/organizational/financial situations
- Observed success rate is high (though low statistics) for MPs + elite MBA
- Suggested MBA paths for medical physicists
 1. MPs with acutely underutilized talent
 - PhD/DABR, 30s-early 40s: + elite Executive MBA
 - not boarded, mid-late 20s: + elite full-time MBA

2. MPs who do not plan to relocate or change careers, and want a low-financial-risk “continuing education” path to an MBA
 - part-time MBA, local accredited public university

Bibliography

- Spence A M, Job market signaling. 1973, Qtr J Econ, 87(3):355-374.
- Akerlof G A. The market for “lemons”: quality uncertainty and the market mechanism. 1970, Qtr J Econ, 84(3):488-500.
- Digest of education statistics 2012. U.S. Department of Education, National Center for Education Statistics.
- CFA Exam Results - historical pass rates. CFA Institute. Accessed online at http://www.cfainstitute.org/programs/cfaprograms/exams/Pages/cfa_exam_results.aspx.
- Mills M D, Thornewill J, Esterhay R J. Future trends in the supply and demand for radiation oncology physicists. 2010, J App Clin Med Phys 11(2).
- Initial certification, medical physics, scoring/results. American Board of Radiology. Accessed online at <http://theabr.org/ic-mp-scoringresults>.

About the Speaker/Author (July 2014)

Daniel Kim was a medical physicist at SUNY Upstate Medical University in Syracuse, NY from 2002 to 2012, starting as a physics/IT consultant and eventually becoming Director and Assistant Professor of Radiation Oncology Informatics. He served as the Upstate New York AAPM Chapter President in 2005; in 2006 he earned ABR therapy physics certification and also won the AAPM Junior Investigator Competition for early-career researchers. From 2002 to 2010, Daniel also held a concurrent full-time position with the Syracuse Symphony Orchestra, performing over 700 concerts as a first violinist and principal keyboardist.

Daniel earned BA, MA, and PhD degrees in experimental particle physics from Harvard University, and is also a 2013 graduate of the Yale MBA for Executives program. His business school experience catalyzed a transition to the investment industry; Daniel is now the Research Director of Zebra Capital Management in Milford, Connecticut, where he plays a key role in deploying the firm's \$640 million under management. Dr. Kim is a joint recipient of the CFA Institute's prestigious 2013 Graham & Dodd top award, given for the best paper of the year in the *Financial Analysts Journal*.