“Conversations with Hiring Managers and Young Alumni about Quantitative Literacy”

APPENDIX: Full text of interviews.

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Summary: The document is based on interviews with former undergraduate business majors who started full-time positions by summer 2008 as well as prospective employers in the various financial services sectors of New York City. A total of 15 interviews. All were asked questions such as, “What are the analytical, quantitative and/or mathematical skills that Baruch students need most?” and, “How do firms assess quantitative literacy in interviews?” The following first appeared in the “Report of the Provost’s Task Force on Quantitative Pedagogy,” Baruch College, September 2008.

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Partner, leading management consulting firm:

We look for good problem solving skills. We test for that through case interviews. These allow us to (1) test one’s ability to structure business problems into manageable, ‘trackable’ components, then (2) to take each one and apply analytical and quantitative rigor to determine solution for each component and then (3) apply business judgment and good conceptual thinking to draw implications of 1 and 2. Traits that do well is facility with numbers and ideas, ability to set up disparate information into a solvable structure (much like setting up equations in math), and creative thinking that would allow one to get to an answer even with no if industry background with case analyzed.

Operations division manager, leading Wall Street investment bank:

We interview people on a competency basis; that is to say we look for peoples’ experiences that line up with several agreed-upon competencies: teamwork, leadership, technical ability, etc. We ask them questions that are geared to elicit what the candidate themselves actually achieved, or did, in the chosen experience and we try and drill through generalizations like, “I was part of a team that did this...” or “we achieved that in a record time...” We try and get to the specific skills that the candidates themselves have demonstrated.

In my side of the organization we tend not, in the US, to focus on quantitative assessment during interview---but that may change. In Europe, we add group reasoning exercises on top of the competency-based interviewing for instance, as well as some industry standard psychometric tests. These tools have not yet been introduced here in the US.
Senior research assistant, well-known provider of financial market intelligence:

Most of the interviews aren’t really that structured. Almost all of our work is done in Excel so we base a lot of our questions on that. We don’t have a set base of questions. We’ll ask the candidates what they have done in Excel and how familiar they are with it. … We will ask what the most complicated functions they have done or what their favorite shortcut in Excel is. We’ve started to think about putting a laundry list of functions to do in Excel together for a candidate to do for us. It would be a better way to test.

Job manager at leading financial services consulting firm:

The primary way we assess the quantitative/analytical/math skills of entry-level job candidates with a bachelor’s degree is through two rounds of case interviews. That is one or two on campus interviews and two on-site interviews, if they make it through the first round. In addition there is a fit interview to assess personality traits, talk about the company’s culture, etc.

In terms of quantitative literacy, we seek the following skills:

• Structuring capabilities - how to break down a problem to solve it
• Understanding of how the world works - concepts like time value of money, probability, pricing, fixed vs. variable costs, etc. are a must
• Response to pressure - new hires need to look confident in front of clients
• Comfort with numbers - an ability to identify relationships between numbers and validate results when solving a business problem

Yet we try not to get too technical on our interviewing to avoid favoring economists and engineers.

Investment banker:

We hire undergraduates every year into a two-year analyst program. I found my interview experience [after my MBA] similar to most investment banking interviews: no formal case-based interview questions, and no formal tests to assess my math skills. However, in every interview, I received a question like, “Consider company X in industry Y. What metrics would you use to measure the value of the company?”

Operations management major, class of 2008:

The quantitative skill we need most is MS-Excel—pivot tables, the WhatIf and SumIf statements, macros, vlookups, etc. I was tested on these skills in a recent interview for an asset management position. This is simple working knowledge, but I never got it in any Baruch class. The SimNet test and tutorial [for teaching MS-Excel] provided at Baruch is horrible. It should be banned.

I recently received an offer at a risk management consulting firm. The interview was highly case based, with individual and group case questions (the group consisted of 4 candidates). The cases were standard for the consulting interviews; I would call them “brain teasers.”
Form letter to job candidates, global management consultancy, October 2001 (reproduced without permission):

We are looking for fantastic people who demonstrate the ability to listen, process information, think creatively, and clearly articulate ideas. Through a number of different exercises we will assess your capabilities in problem solving, impacting others, building relationships, and achieving.

- Problem solving: Reasons logically, demonstrates curiosity, creativity, good business judgment, tolerance for ambiguity, and an intuitive feel for numbers.
- Achieving: Sets high aspirations for self, expects and achieves outstanding results, handles obstacles well, shows signs of entrepreneurship and willingness to take personal risks.
- Impacting others: Positively influences others, shows an interest in other people, self-confidence without arrogance, listens, understands and responds well to others.
- Building relationships: Takes on leadership roles, seizes opportunities and takes action, helps to build highly effective teams with a shared vision, and is sensitive to the thoughts and feelings of other team members.

Finance major, class of 2008, hired as financial analyst at major manufacturer of food, home care, and personal products:

Baruch needs to make Excel more built into the classes we already take. Also, pivot tables and V-lookups seem to be in demand. Yet, I have never learned what either function is. These two should be taught rather than, say, how to use the internet, in the mandatory info. systems class. Also, perhaps more papers can be required to be completed in Excel rather than Word or PowerPoint.

I had three interviews and a case study. All questions seemed to be more behavioral rather than analytical. Each interview had its own theme. The first focused more on Leadership, the second on growth and teamwork and the last on thinking process, i.e. “How would you solve this problem?” The case study was more to see how you would interact with others (it involved four other people) and take their view on a matter and use it to benefit the entire team rather than just force your own view on everyone else.

Accounting major, math minor, class of 2008, auditor at “Big Four”:

I love math. In the interview with [my firm], they asked me a lot of questions to see if I would be a good team player. To assess my quantitative skills, they asked me why I was interested in math. I guess my answer was good enough because they didn’t ask any other questions. I feel that my training in math at Baruch was pretty good.

Finance major, class of 2007, now entrepreneur:

This summer, I founded a company and hired 2 full-time workers as well as hundreds of freelancers. … Basically, neither quantitative/analytical/math skills are needed in a day-to-day job. All I keep focus on is to keep the company organized, goal oriented (sales forecast) and busy. Cash flow statement is important. Negative cash flow can kill us instantly.

What I am looking forward to have from Baruch students is generally a friendly and open personality, good looks, energy, initiative and some analytical skills to compare things, find better outcome, avoid a mistake, choosing a better paying project, etc. I need people who can have a
great vision, not just focus on some routine accounting tasks or operating efficiencies. I need people who can justify expense I am putting in them and bring more in return.

Finance major, class of 2008, hired full-time by a major investment bank:

The interview process for front office is very rigorous. In addition to behavioral questions, they certainly have case-based questions, which are known as “brainteasers.” Example: “How many taxi cabs are operating in NYC?”

Moreover, they will also ask the candidate to walk them through the Discounted Cash Flow model and comparable (comps) analysis. (investment banking related) Other questions include: “How are the three components of financial statements interrelated?” (accounting-related) “Can you pitch me your favorite stock?” (equity research related) “What would you invest in with $100,000?” (asset management related) “How do you price options/bonds?” (sales and trading related)

I never asked my employer about what quant skills that Baruch students lack, but what I’ve heard from some professionals is that they lack TRUE understanding about the financial markets and how the industry operates. More importantly, the students lack hands-on experience in analyzing and projecting financial statements using Excel (referred as “financial modeling” in Wall Street). Other top undergrad business schools have offered such a course, including NYU and UPenn.

The specific skills that I wish to pick up early are financial statement analysis and portfolio management skills. (This has led me to co-found the Portfolio Management Club). We need to realize that Baruch is not a core school for top investment banks, and therefore we truly need to develop more hands-on learning experience for students if we really want to climb the ranks. Keep in mind that we do have incredible aspects that many other top schools do not have such as the Subotnick Center trading floor and proximity to Wall Street.

Human resources major, class of 2008:

In terms of [the skills I lack in] Math, I will need to do some research. … More business writing and business presentation courses are needed at Baruch.

Finance major, math minor, class of 2008, analyst in a private asset management company:

[In my interview,] I was asked more quantitative than straight finance questions; however they were finance-related. I had a very short test, almost verbal. ... they asked “knowing a monthly Sharpe ratio, how to calculate yearly Sharpe?” … This simple question covers both knowledge of financial concepts, and basic understanding of statistics.

Students who are interested in more quantitative jobs in finance should take 2 classes in statistics. … From what I noticed, many students forget simple concepts ... because what they are taught is plugging numbers in formulas ... A cook-book style is good for solving simple problems, but not for more sophisticated applications. Students must understand that introductory statistics that they take will come back in various forms in other classes.

Also, standards are different in many colleges. There are many transfer students who have statistics listed in their transcript, however don’t have enough understanding… An entrance exam would be very useful.
To my disappointment I happened to have some finance professors who seem to be quantitatively illiterate... With all respect, if a professor uses mathematical notation, one has to a) understand its meaning and b) be able to explain correctly to his students what it means. Many students can’t understand the true meaning behind the formulas, and are doomed to memorize them without thinking. My suggestion is, professors must derive some formulas for students, and show where these the result comes from.

Probably students lack these skills:

• Using excel; students must take advantage of excel workshops held in our library. VBA [visual basic and visual basic macros in Excel] workshops (not offered) would be useful too.
• Using regressions; students must pay more attention to that in Statistics, Operations Management, Econometrics and Introductory Investment Analysis.
• Understanding where to get data and what data to use. Given numbers, students know how to plug these. The question is, what numbers to plug?
• Lots of credit goes to professors who use case studies and real-world data. Example: given a sample of data with interest rates for T-bills and T-bonds of different maturities (including historical rates and current rates) which rate to choose as a risk-free rate in CAPM (capital asset pricing model).
• Ability to solve percentage problems. Other than that, entry-level positions don’t require much math.

For people interested in highly quantitative jobs in finance (such as risk managers, quantitative analyst, quantitative developers etc) I would recommend 1) *Heard on the Street: Quantitative Questions from Wall Street Job Interviews* by Timothy Falcon Crack, 2) *Frequently Asked Questions in Quantitative Finance* by Paul Wilmott.

Finance major, class of 2008, hired by leading global financial services firm:

The interview for my position (middle office/operations) was entirely behavioral questions [not quantitative]. However, for front office positions, the interview process is a rigorous 4 to 5 rounds. Round 3 tests the candidate’s knowledge of finance, accounting and the stock market in general. I highly recommend the book *Vault Guide to Finance Interviews: Your single best resource for conquering finance interviews*, 6th ed. Bhatawedekhar & Jacobson, Vault Inc., 2005. It is a must have.

Finance major, class of 2008:

The course which I believe was most useful for teaching Excel skills is CIS 2200. We did some extremely basic things like defining what the cell is (!). It would be helpful to re-fresh our memories or learn more about advanced Excel applications. ... ECO4000 [econometrics] was a great course which emphasized logical and analytical thinking.

* In addition to the usual review of valuation techniques, equity analysis, stocks, mergers and acquisitions, the *Vault Guide to Finance Interviews* gives a chapter on “brainteasers and guesstimates” (p. 133). How many gallons of white house paint are sold in the US every year? What is the size of the market for disposable diapers in China? How many square feet of pizza are eaten in the US each month? How would you estimate the weight of the Chrysler Building? Why are manhole covers round? If you look at a clock and the time is 3:15, what is the angle between the hour and minute hands? There are 14 more such examples in the text.