Do MBAs Pick Winning Stocks When Choosing Their First Job?*

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Abstract

Every Summer and Fall, freshly minted MBAs take new positions at companies. We analyze whether their choices have any predictive power for the success of those companies and what drives the choices made by the MBAs. We show that, not surprisingly, MBAs tend to join companies that have been successful in the time leading up to the beginning of employment. The companies' stock, on average, continue to substantially outperform the broader market in the year after new MBAs join. Most, if not all, of this outperformance after hiring can be explained by the fact that the employers tend to be high beta firms. Adjusting returns for a factor model, we find that adjusted returns are roughly zero. We go on to examine similarities and differences between firms that hire MBAs and those that hire other workers.

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1 Introduction

Shortly after graduating, MBAs from top schools are often given a fair amount of authority to act on their firms' behalf in making investments and other decisions. Before they can act on the behalf of their new employers, these students have to make a large investment decision of their own – which firm should they work for? Working within the constraints of the demand side of the labor market, students have to decide whether to work for a company that is growing and risky, big and profitable, or trying to turn its fortunes around. Do they make wise choices?

In this paper, we analyze the first job of new MBAs from one of the leading American business schools. We ask whether the jobs they take have any predictive power for the stock market returns of the firms that hire them and what we can learn about early-career labor supply.

We might expect that, having spent a great deal of time interviewing with a variety of companies in a variety of industries, these students may have gathered useful information about which companies are poised to do well. In addition, we might expect that firms that have private information that their prospects are bright would choose to invest in talented people to complement those opportunities. If either or both of these inside information stories is important, firms that hire new MBAs should outperform the market in the period after they hire the new workers.

On the other hand, there is a great deal of anecdotal evidence of MBAs flooding into certain types of businesses right before things went sour. For example, the hot job market for new MBAs was investment banking in 1986 and 1987, internet-based businesses in 1999 and 2000, and private equity around 2007.[1]

A strictly efficient stock market would find no predictive power based on where MBAs take jobs, at least not using the type of public data we will using in this analysis. In fact, we find no abnormal return for the stocks of firms where MBAs take new jobs, nor those where they go to work as Summer Interns. We also find that a student accepting a full-time job at the company that employed him for a summer internship does not provide inside information about the company's stock performance. We show that the raw returns of firms MBAs join are several percentage points higher in the year after new MBAs graduate (or Summer Interns) take positions at a firm. However, this excess return can be fully explained by a market model – the new firms tend to have high betas.

We do find, however, that new MBAs are hired by firms that have just gone through a period of large abnormal returns. Firms outperform the market in the year leading up to MBAs starting their new positions and they have high alphas based on average returns over the previous five years.

[1] In a slightly different look at the relationship between MBA hiring and stock returns, consultant Roy Soifer has argued that the stock market in general does poorly whenever a large fraction of Harvard Business School graduates take jobs in the financial sector.

Unless a market participant has the ability to predict who will take jobs at these firms, however, there is no way to profit from this relationship. We also show that the positive pre-graduation returns and the zero market-adjusted post-graduation returns are consistent during good and bad markets. That is, the firms MBAs will go to outperform the market in the year leading up to the job starting, and they keep pace with the market in the year after hiring, whether the overall market is doing well or poorly.

We then show that the fact that MBAs choose firms that are doing well during the recruiting process is because they pick (or are picked by) firms in industries that are doing well. The firms that MBAs go to are in industries that are outperforming the market but those firms are not, on average, outperforming others in their industries.

While finding that MBAs go to firms that are doing well, but that these firms do not outperform the market after the MBAs begin working there, seems sensible in terms of market efficiency, our findings suggest some important differences between the hiring of MBAs and other workers. Belo, Lin, and Bazdresch (2013) show that firms that go on a wide-scale hiring spree tend to underperform the market a year after taking on many new employees. Part of this is explained by the fact that firms that higher larger number of workers have less macroeconomic risk. So, unlike firms hiring MBAs, they are low beta firms. Firms hiring MBAs in our sample tend to be riskier and, ex post, more successful than firms that hire other workers.

We then go on to do an analysis (which is, at this point, quite preliminary) of what types of firms hire MBAs in our sample compared to public firms more generally and those that hire many other workers. We discuss how differences across these groups of firms may reflect choices made by MBAs as they start their careers.

2 Conceptual Framework

We focus on two economic entities – firms that hire newly minted MBAs and the new graduates themselves. For much of the analysis, the part each of these entities plays is difficult to separate. We only see completed employment agreements (that is, accepted offers) between workers and firms. We do not see the outside options of either party nor do we see opportunities either would have preferred. That is, we do not see offers that students turn and we do not see what firms employees might have preferred to the ones that they join. As a result, our ability to determine whether supply or demand drives the relationships we see is limited, though we will attempt to make inferences along these lines by comparing our results during bad economic times (when students have fewer options, suggesting firms' preferences play a more important role) and good economic times (when

students have more leeway to choose their job.)

We ask three empirical questions. The first is a fairly straightforward finance question – can an investor make money by investing on the basis of where MBAs go to work? We use standard event study methodology for this. We essentially mimic investing one dollar in the company of each MBA student's new employer beginning on July 1 of the year of the student's graduation and we see how that investment fares relative to a similar-sized investment in the broader stock market over the course of one year. We will explain the details of how we measure excess returns in Section 4 below. We also measure the excess returns in the year leading up to graduation, but this is only related to a tradable portfolio if an investor can determine in advance (possibly by looking at which firms are recruiting heavily, which made offers to summer interns, and related information) where graduates will accept jobs at the end of the school year.

If markets are efficient, there is no reason to think firms hiring MBAs would outperform or underperform the market. However, there are at least two potential reasons firms hiring MBAs can outperform the market. First, students gather a great deal of information in the process of interviewing with and, eventually, being courted by firms. During this time students may see things in the works at companies that will not be known to the wider market until later, and choose firms whose attributes look particularly valuable and exciting. If this is the case, then we might expect students to essentially be insiders whose job choices foreshadow positive excess returns. We also look separately at returns of firms where students take a Summer Internship and then return to a full-time position upon graduation, looking for evidence that their probationary time there reveals useful private information. Second, individual firms have private information about their own prospects. If they hire MBAs more aggressively when the outlook is favorable, and the market is not able to see their MBA recruiting plans and success as the hiring process takes place, then firms will outperform the market in the period after the new recruits join firms.

The second question we address is whether returns of firms that hire MBAs differ systematically from firms that hire other employees. (Belo, Lin, and Bazdresch (2013)) show that firms that stock returns are systematically related to hiring. More specifically, hiring in one year is negatively related to stock returns in the following year. We investigate whether there is a similar pattern for firms hiring MBAs and, to the extent that stock returns of firms hiring MBAs differ from those of other firms, how firms hiring MBAs differ from firms hiring other employees.

Our final question (or set of questions) focuses on what can be learned about professional labor markets by looking at where new MBAs choose to start their careers. Do MBAs seek relatively safe companies or do they take risks when picking initial jobs?

There are reasons to think a typical new MBA would prefer to go work for a large, stable, and

low risk company. For one thing, first jobs after leaving school have a long-term impact on people's labor market outcomes in general (Kahn (2010)) and for MBAs in particular (Oyer (2008)). So MBAs have a reason to be conservative in initial job choice given that an initial unlucky outcome may have long-term ramifications.

In addition, large companies offer a broader set of functional and product options, allowing a new employee to look for a good fit for his skills and interests by trying out various things. Though less common today, many large companies used to have thriving rotation programs where new employees would be systematically moved around to different areas before settling in to what the firm and employee agreed was the best place for the employee.

There are reasons to think long-term matches straight out of school are the exception, rather than the rule, however. As professional labor markets have moved more towards rewarding general human capital rather than firm-specific human capital (see suggestive evidence for this in Murphy and Zabojnik (2004)) individuals can undertake a trial-and-error process themselves by moving from company to company early in their careers. In addition, Topel and Ward (1992) show that the broader population of young men move jobs frequently early in their careers. So we might expect that new graduates would be willing to take some chances with their initial placement given it is unlikely to be a permanent match anyway.

In addition, we might expect new MBAs would prefer to work for relatively risky ventures based on the evolution of risk aversion throughout the life cycle. New MBAs are still relatively young and unlikely to have significant obligations such as children or a mortgage. Though some have either or both of these, most do not. In general, people rationally become more risk averse as they age.

It is an empirical question, then, as to whether new MBAs go to high or low risk firms. We will look at how the betas and volatility of the stocks of the firms that employ new MBAs compare to those of the market as a whole. Note that we are somewhat limited in the conclusions we can draw, however, because only about half the new MBAs in our sample start their careers at publicly traded companies.

We also take advantage of the fact that, over the period of our sample, there are some very good years for MBA graduates and some years where the job market is quite tight. As Kuhnen and Oyer (2013) show, MBAs receive more job offers in years where the economy is doing well. So we expect that in "good" years (which we will define as those where market stock returns are high or unemployment is low), the jobs chosen by MBAs are more of a reflection of their own choices while in "bad" years, MBAs have to choose from a more limited set of options. If we see MBAs make different choices depending on the state of the economy, we expect the choices made in good times to more accurately reflect the optimal first jobs of MBAs.

We might expect MBAs to target more stable companies in down markets. As Malmendier and Nagel (2011) show, economic conditions early in a worker's career affect not only his long term prospects but also his attitude towards risk. On the other hand, new MBAs could well be among the most willing to accept risk in rough economic times. For one thing, young workers suffer less from job displacement than their older counterparts (Kletzer and Fairlie (2003)). In addition, their parents and, more specifically, their parents' house, can provide insurance (Kaplan (2012)).

We will be careful, when interpreting our results, to consider how differences based on economic conditions may be a reflection of a typical MBA's preferences, changes in those preferences based on the conditions a given MBA faces, and variation across the business cycle in employers' demand for new MBAs.

3 Data

Our sample consists of new graduates of the Kellogg School of Management at Northwestern University between 1980 and 2005. Each year, the school's Career Management Center publishes a "Placement Report" that lists the employer of each graduating MBA, as well as the Summer Internship employer of each student who has finished the first year of the two-year program. Students volunteer this information to the Career Office which then publishes the report. While the Summer Internships are all students that are halfway through the traditional two academic year Kellogg MBA program (though a small subset of these are in a joint MBA/Engineering program), the graduating students are made up of several groups. Most are finishing the second year of the full-time MBA program or the two-year joint MBA/Engineering program. Some students get an MBA in one calendar year (the Kellogg "Four Quarter" program), some are finishing a part-time MBA program or have transferred from that program into the traditional MBA program, and some are completing a four-year JD/MBA program. In 2000, for example, there were a total of 794 graduates. 526 of these students had been in a two-year full-time program (MBA or joint MBA/Engineering), 82 were Four Quarter program graduates, 14 were JD/MBAs, and 172 were finishing the part-time program or were graduating having transferred from that program into the MBA program. Of these 794 students, 552 had accepted positions that they reported to the Career Office and which were in the published report.

Earlier placement reports do not all provide this detail on the breakdown of students by program and none of the reports specify which students came from which program. This is probably because, at least in the earlier years of our sample, the full-time MBA was dominant. The part-time students are only allowed to use the recruiting office if their current employer allows them to do so or if

they are paying their own tuition. Though we do not have hard numbers on this, anecdotal reports suggest that self-sponsored students have become more common in the part-time program. This has led to part-time program students making up a larger fraction of our sample over time and it has also brought down the fraction of graduates reporting their first employer because, since most of the part-time program participants already hold a job, they are generally in less of a rush to find a position.

Table 1: Summary Statistics

	Full Time Positions	**Summer Internships**
Total Number of Students	12237	10296
Students in Public Companies	6060	5781
Students with "Rolling" β	5393	5121
June of Relevant School Year		
Volatility	.0725	.0737
	(.0300)	(.0306)
Return	.0022	.0025
	(.0802)	(.0807)
Market Return	.0044	.0034
	(.0313)	(.0313)
All Months		
α	.0048	.0049
	(.0095)	(.0094)
β	1.055	1.0590
	(.5058)	(.5066)
Volatility	.0723	.0735
	(.0295)	(.0303)
Return	.0092	.0102
	(.0931)	(.0916)
Market Return	.0062	.0064
	(.0440)	(.0431)

Note: Return and Market Return are less the risk free rate. α and β are those from the Rolling CAPM model.

Table 1 reports summary statistics for our sample. Over the twenty-five years for which we have data, we have a total of 12,237 accepted full-time positions and 10,296 accepted Summer Internships. The difference is due to the fact that the part-time and Four Quarters programs do not include time for a Summer Internship.

We can only analyze the stock returns of students who take jobs at publicly-traded companies. We use the placement reports to match students with firm stock return data from CRSP. We can only include students for whom we have enough data about their employer to estimate stock volatility and the parameters of CAPM and Fama-French models. We therefore limit the sample in all our analysis to companies students joined that were publicly-traded at some point in the 12

months before or after they started working. This includes a little under half (49.5%) of the full-time jobs and 56.1% for internships. Some of our analyses are further limited to people who work for firms for which we have sixty months of pre-graduation return data to use in our calculations of volatility and market model parameters. In these cases, 44.1% of full-time positions and 49.7% of internships can be included.

When a student's employer is taken over, we attempt to continue measuring his firm's stock return. As long as the takeover is by another publicly-traded firm for which we can estimate a market model, the stock return data can continue seamlessly.

As the table shows, stock volatility and return are high in our sample. We measure volatility as the root mean squared error from a Capital Asset Pricing Model using monthly data for the sixty months prior to the observation (which, for the central panel of the table is June of the year of graduation for full-time positions or June at the start of a Summer Internship.) Volatility of about 0.07 is a bit higher than blue chip volatility such as (using June 2000 figures) at 3M Company (0.063), Allstate (0.059), and General Electric (0.043). Volatility varies greatly within the sample, with some extreme examples (again from 2000) such as Gateway Computers (0.144), Oracle (0.147), and Apple (0.152).

Average raw stock returns for the month of graduation are double the market return for full-time students while raw returns exceed market return by ten basis points in the June at the beginning of Summer Internships. As the bottom panel of the table shows, the raw returns are sizable relative to the market when we look at all months in the year before and after a student takes either type of job. We would expect these firms to outperform the market given the typical Beta is over 1. The table also shows that we are measuring our market models during periods that are typically very good for these stocks as they have sizable monthly alphas averaging about forty basis points.

Figure 1 depicts the cumulative raw returns of the hiring companies relative to the market return over the course of the year before and the year after graduation. Here we can see how much larger the average cumulative returns of companies that offer full-time positions are relative to the average market returns during the same time periods. Returns are higher both before and after graduates start working and they are consistent across full-time jobs and summer internships. These figures and statistics are our first indication that stocks of companies that hire MBAs perform quite well in the two years surrounding the acceptance of offers.

There is considerable time series variation in the types of companies students work for over the twenty-six-year period we study. Figure 2 shows the fraction of graduating students who take jobs in Marketing (Brand and Product Management), Finance (Investment Banking, not Commercial Banking), Management Consulting, and High Technology. The two most significant trends among

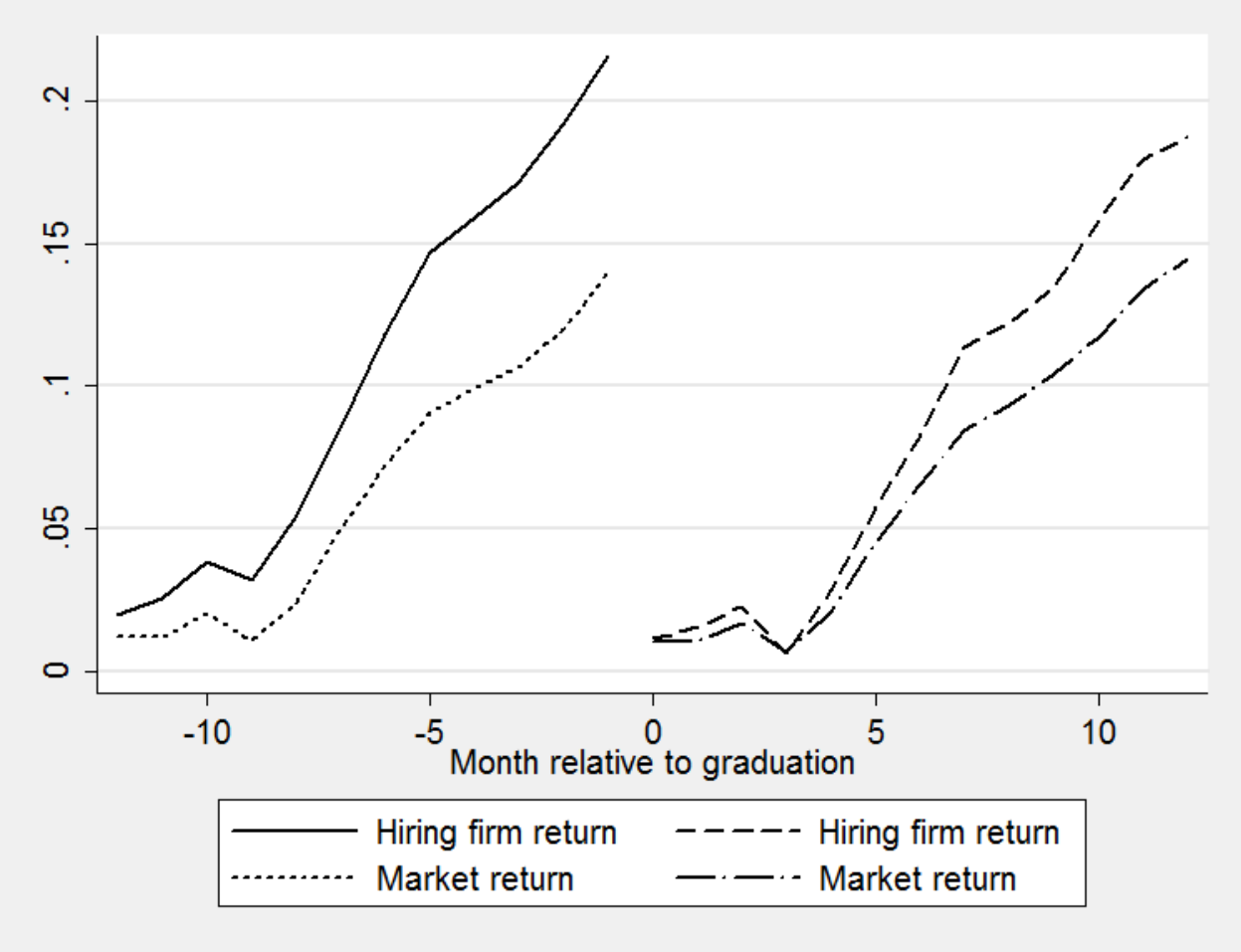


Figure 1: Performance of Firms MBA Graduates Join Full Time.

Kellogg graduates are the rapid and sizable increase in students taking positions with consulting firms and the decline of brand management as a career entry point. For example, two members of the Class of 1981 went to work for McKinsey, Bain, Boston Consulting Group, or Booz, Allen, and Hamilton while ninety members of the Class of 2000 went to work for one of these four firms. Other less dramatic trends include a larger fraction of the class going into Investment Banking and at least a temporary jump in technology jobs around the time of the Internet Bubble in the late 1990's.

The dotted line in Figure 2 shows the fraction of graduating MBAs that take jobs at publicly-traded firms. These graduates form the core of our sample, though some people who go to public firms are not included because we do not have enough data to estimate a market model for their employer. The rise of consulting and decline of product management as first jobs led to a decrease in the fraction of MBAs going to public companies for most of the 1990's. However, the rise of

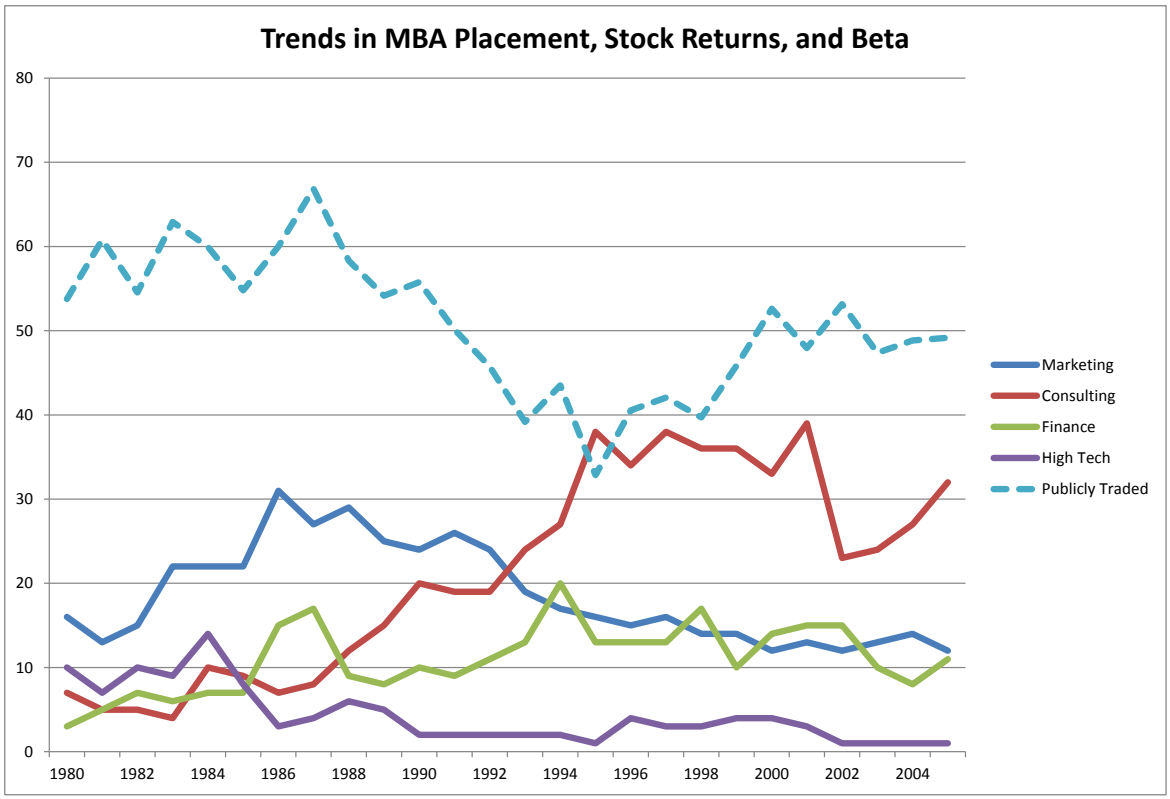


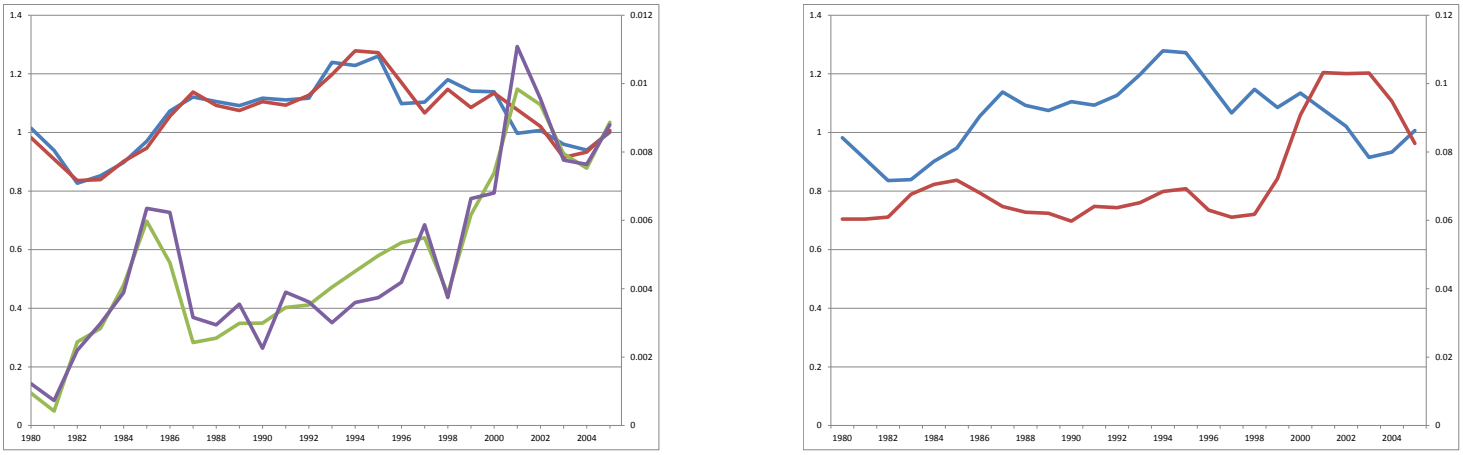
Figure 2: Sectors of first job taken by graduating MBAs.

investment banking and interest in high technology turned the trend around in the early 2000s.

Figure 3 shows the time series changes in alpha, beta, and volatility of MBA first jobs over the course of our sample. First note from the left graph that the trends among full-time and summer firms are identical so we focus on full-time hiring firms for the rest of the descriptive analysis. The most dramatic change is in the alphas we estimate using CAPM (alphas from the Fama French factor model are similar). Though always positive, on average, over the period we study, they become quite sizable in the mid-80's and are more than sizable around 2000. The alphas of approximately 0.01, which are based on monthly returns, indicate that a typical student in our sample graduating around 2000 was going to work for a firm that outperformed the market by more than 10% per year in the five years leading up to graduation.

Figure 3: Alpha, Beta and Volatility

Alpha and Beta **Beta and Volatility**



Note: In the first panel the Red line represents the Beta for Full Time positions, the Blue line represents the Beta for Summer Internships. The Purple line represents alpha for Full Time positions and the Green line represents the alpha for Summer Internships. In the second panel the Blue Line represents beta and the Red line represents volatility. Alphas and volatility are measured by the secondary axis on the right

The betas are generally more than one, though they average less than one for a few years in the recessions of the early 1980's and the early 2000's. Average volatility is quite consistent for the entire sample except in the late 1990's and early 2000's, coinciding with the internet boom and bust. This is not surprising given the jump in technology-related job placements shown in Figure 2.

4 Method

We use a "rolling" (that is, we update α and β each month) version of the Fama-French three factor model to calculate each firm's alpha and market factor betas.[2] We match the stock data from CRSP to our sample of MBA students. For each firm that employs at least one student in any given year and for each month within one year of graduation (or the start of a Summer Internship), we calculate α's and β's using data from the previous sixty months. As a result, each month has a different alpha and beta estimate and, because we require five years of return information to calculate the alphas and betas, we lose some observations.

[2]Our results are similar when we use a rolling version of the CAPM as well.

As previously mentioned, incorporating acquisition information enables us to keep track of the companies with which each student is associated in the year before and after graduation (or starting an internship). When a student's employer is acquired by another public firm, we use the new firm's market beta, alpha, and return data for analysis.

We estimate the following version of the Fama and French (1992) model:

$$R_{ij} - Rf_j = \alpha_{it} + \beta_{it}(Rm_j - Rf_j) + \theta_{1it}SMB_j + \theta_{2it}HML_j + \epsilon_{ij}. \quad (1)$$

R_{ij} is defined as the return for firm i in period j and Rf_j is the risk-free rate (the one month treasury bill rate). Rm_j represents market returns in period j. Here j is defined as the period of months from t-59 to month t. The market return is the value-weighted return of all CRSP firms incorporated in the US and listed on the NYSE, AMEX, or NASDAQ.[3] SMB stands for small-minus-big and HML for high-minus-low. These factors are constructed using value-weighted portfolios based on size and book-to-market ratios. SMB is the average return of the difference between small and big portfolios while HML is the average difference between value and growth stocks. In some cases, we estimate a simpler CAPM model, which is equation 1 under the restriction that θ_{1it} and θ_{2it} both equal zero.

We follow firms for the year before a newly hired student joined the firm and a year after. So for each class of students we define the month relative to graduation as 0 in June and index the periods of interest from -12 to 12. This is done in the graduation year for full-time students. Similarly, for summer internships we define June of the year in which the internship takes place as 0, and again index the periods of interest from -12 to 12. These indexes correspond to specific months (for a given year). For example, for the class of 1980, June 1980 is indexed as 0 and May 1980 is indexed as -1. After estimating the regressions in equation 1 at the monthly level we match the $\hat{beta}_t$ values to the appropriate month year, and thus month relative to graduation.

We then calculate the cumulative of the average (by student) return, alpha, and excess return for the year leading up to the start of the job (months -12 through -1) and the year following the start of the job (months 1 through 12).

[3]See Ken French's website for details.

5 Results

5.1 Excess Returns

We begin by looking at excess returns for those taking new full-time jobs. Figure 4 shows the cumulative average returns for Rm_j - Rf_j (the market net of the risk-free rate), R_{ij} - Rf_j (firm return net of the risk-free rate), and what we will refer to as "excess returns" (α_{it}, and ϵ_{ij}). The four parts of the graph show this for four different samples, as discussed below.

As we saw in Figure 1, the raw returns of the firms that MBAs join (now net of the risk-free rate) are higher than those of the market. The excess return lines in the top left graph in Figure 4 summarize our basic findings which we show more formally below. Excess returns are strongly positive in the year after accepting a full-time position, which is driven almost entirely by the fact that the firms MBAs join are high "alpha" firms – they have been outperforming the market for years. In the months leading up to graduation, the firms students join perform much better, on average, than the rest of the market. The excess returns are positive, economically large, and significant indicating that these firms are outperforming the market in the pre-hiring "event window" through high alphas.

In the year after graduation, however, excess returns are essentially zero. These firms continue to have large and positive alphas (which evolve slowly given we measure them over a sixty-month period) but their total excess returns revert to the mean. On average, the firms MBAs join perform as a market model would predict in the year after hiring.

The top right and bottom left graphs in Figure 4 show that these same patterns hold regarding Summer Internships. The top right graph shows returns for the year leading up to the June of the start of the Summer in which the internship is held and year following the start of the internship. Just as with full-time jobs, these firms outperform the market significantly in the year leading up to the start of the internship but, on a risk-adjusted basis, return to average performance in the year after the start of the internship.

The bottom left graph of Figure 4 suggests that there is no market relevant private information in the typical Summer Internship. it shows returns for the same full-time sample as in the top left graph, but it limits the sample to students whose full-time job is with their Summer Internship employer from the previous year. The results are identical to those for the broader sample.

The final (bottom right) graph in Figure 4 allows us to compare companies that hire MBAs to companies that plan to hire them but do not. In each of the Kellogg Placement Reports from which we gather our data, there is a listing of all the companies that recruit Kellogg students through the school's on-campus recruiting system. From this, we are able to generate a list of companies each

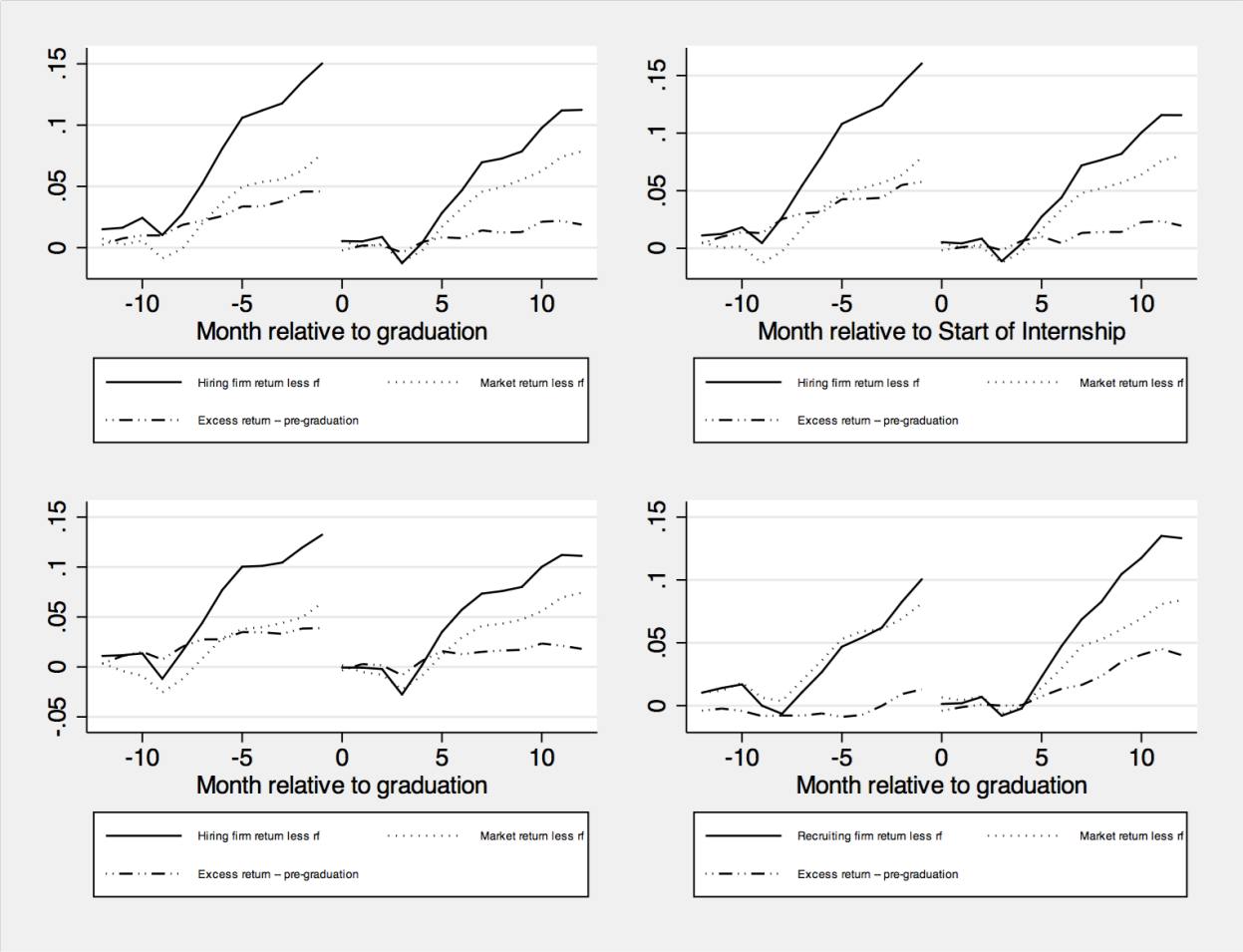


Figure 4: Performance of Firms MBA Graduates Join Full Time.

Top Left: Full-time jobs of graduates; Top Right: Summer Internships; Bottom Left: Full-time jobs taken by at firms where student had been a Summer Intern the prior Summer; Bottom Right: Firm/years in which the firm recruits on campus but does not hire anyone for either a Summer or Full-Time position. Note that excess returns depicted are based on the rolling CAPM model. Results are similar using the rolling Fama French model.

academic year that recruit Kellogg students but do not succeed in hiring any for either a full-time or Summer Internship position.

The logic behind this analysis is that it is a plausible way to separate the supply and demand side of the market. That is, if we make the (strong but not outrageous assumption) that firms that recruit on campus but do not hire anyone wanted to, in fact, hire people, then we can think of these as firms that MBAs chose not to join. The figure shows the stock return information for these non-hiring firms focusing on June of the end of the academic year in which the firms recruited on campus but did not successfully hire anyone. This figure is analogous to top left graph in Figure 4 (firms that hire full-time workers) but looks quite different.

There are at least three noteworthy features of the bottom right graph in Figure 4 as compared to the top left graph. First, as we might expect, the firms that recruit but do not hire perform, on average, on a par with the market in the year during which they are recruiting with no success. So, though they are not performing as well as firms that successfully recruit and hire MBAs, the firms that recruit with no success are at least keeping pace with the market overall. An investor could not make money betting against these firms, even if he had advance notice that the firm's recruiting would be fruitless. Second, these firms are lower market risk (lower beta) firms than the firms that successfully recruit. This is consistent with the notion that MBAs prefer higher risk firms when possible. Third and potentially of most interest, the firms that recruit unsuccessfully beat the market in the year *after* they fail to hire. That is, if a firm recruits at this school during academic year t without success, it will, on average, outperform the market in year *t+1*. This excess return relative to the market is approximately the same magnitude as the amount by which firms that successfully recruit outperform the market in the year of the recruiting. But because the excess return for the unsuccessful recruiters comes a year after the recruiting, one could plausibly profit from this market difference.

It's hard to say exactly why firms would do well after failing to recruit. This result is, on its face, consistent with a "Winner's Curse" in the MBA hiring market, except firms that successfully recruit do not underperform the market. It could also reflect the idea that, in broader samples, firms that do not hire tend to outperform the market (Belo, Lin, and Bazdresch (2013)).

We now analyze the numbers underlying Figure 4 more formally to determine which, if any, are statistically significant and which are statistically distinct from one another. Table 2 shows the average cumulative excess return for the one year period before and after June for full-time jobs, Summer Internships, and firms that recruit but do not successfully hire anyone.

Specifically, for each graduate who takes a full-time job at a publicly-traded firm, we calculate the excess return including alpha ($\alpha_{it} + \epsilon_{ij}$) in each month from the June of the year before the student graduates through June of the year after graduation. We then cumulate these returns over the twelve month period ending June 1 of graduation year ("Pre-June" row) and over the twelve month period starting June 30 of graduation year ("Post-June" row). The averages are displayed in the "Full-time Positions" column.

Similarly, for each student starting a new Summer Internship, we calculate the excess return including alpha ($\alpha_{it} + \epsilon_{ij}$) in each month from the June of the year before the person starts the Summer Internship through June of the year of the the internship. We then cumulate these returns over the twelve month period ending June 1 of the internship year ("Pre-June" row) and over the twelve month period starting June 30 of the internship year ("Post-June" row). The averages are

displayed in the "Summer Internships" column.

The final column shows the excess returns of firms in each month of the year in which they recruit on campus without hiring anyone ("Pre-June" row) and over the twelve month period after that academic year ("Post-June" row).

Table 2: Cumulative Excess Returns

	Full-Time Positions	**Summer Internships**	**Recruit - do not hire**
Pre-June	0.0275	0.0363	0.0019
	(0.2645)	(0.2569)	(0.2394)
	[4,729]	[4,501]	[1,023]
Post-June	0.0076	0.0039	0.0311
	(0.2454)	(0.2387)	(0.2573)
	[4,770]	[4,528]	[1,013]

Note: Standard deviations are in parentheses and number of observations are in brackets. The estimates are from the rolling Fama French model.

The coefficient 0.0275 for Pre-June Full-time jobs means that, after adjusting for the three Fama-French factors, the average student goes to a firm that outperforms the market by about 2.75% in the year before the student graduates. This is much larger than the 0.76% in the year after graduation. Both of these estimates are statistically different from zero at any reasonable confidence level. We can also reject that the post-graduation return equals the pre-graduation return with greater than 99% confidence. The magnitudes are slightly different for Summer Internships but the message is very similar and, again, the averages are statistically different from zero and from one another.

As we might expect, workers are drawn to firms during periods where they are performing well and, on average, the firm's stock performance mean reverts in the period after the student begins working. Returns are clearly higher leading up to taking a job than they are after the job begins. If a trader had information about which firms MBAs would join as full-time employees or as Summer Interns one year in advance, he or she could earn approximately a 3% risk-adjusted excess return. However, once the student graduates or starts as an intern, the firms' returns are essentially equal to the market return (on average) in the subsequent year. Neither betting *on* the firms MBAs go to work for, nor betting *against* them, at the time of graduation is a winning investment strategy.

The right column is probably the most interesting and surprising. As the earlier graph suggested, firms that recruit MBAs and fail to hire them perform on par with the market (the excess return is 0.19%) in the year of the failed recruiting. But these firms outperform the market by over 3% in the following year. This excess return is as large as the excess returns of firms that successfully

recruit in the year of the actual recruiting and it is statistically different from zero and the prior year for these same firms. While this obviously requires more investigation, it suggests a tradeable arbitrage opportunity similar to many other finance "anomalies".

If we assume that the firms that recruited on campus but did not hire actually wanted to hire but were not attractive enough to be successful, then we can conclude that the fact that firms do well in the year in which they hire employees is driven by students choosing successful firms rather than firms whose stock is going up choosing to hire more. That is, the relationship between stock returns and hiring would be driven by labor supply rather than labor demand.

However, this conclusion would be invalid if firms recruit and then, once they observe how they are doing in that particular year, determine whether to make offers or not. To further probe the supply-vs.-demand issue, we now look at how hiring firms' returns differ depending on the state of the job market.

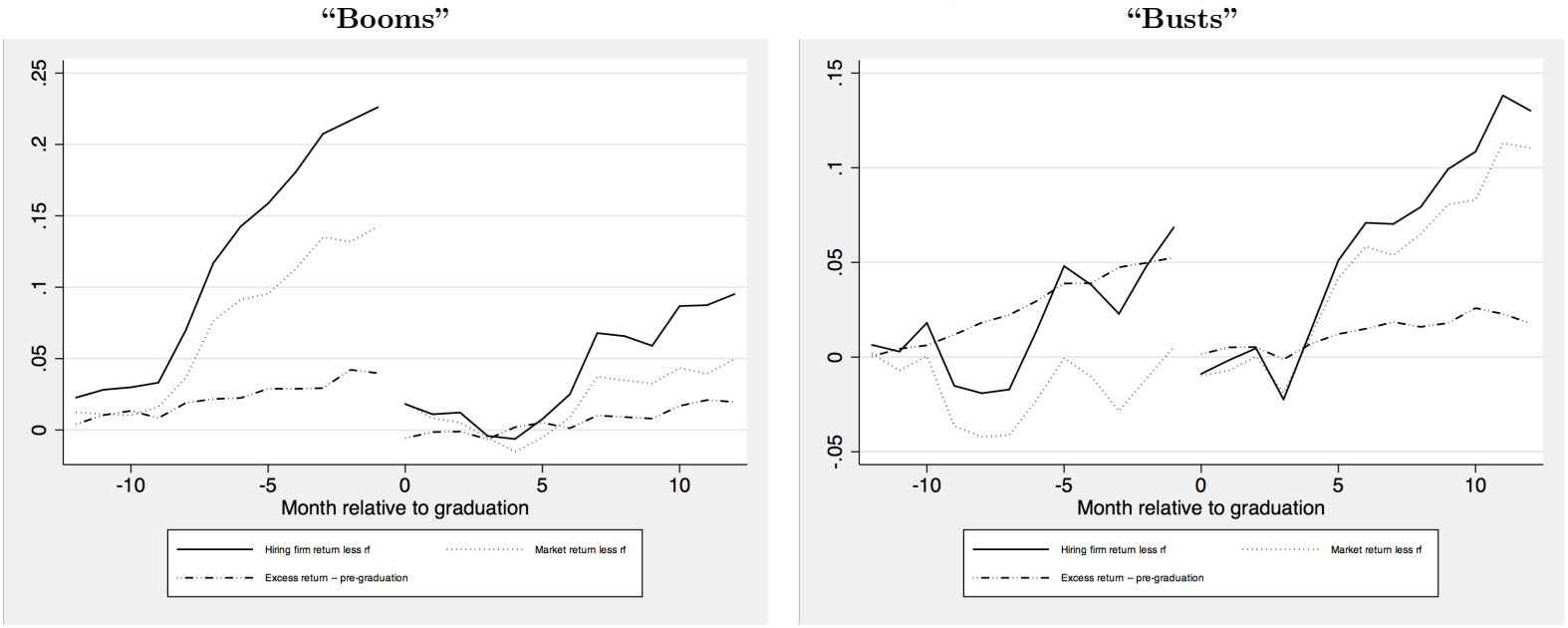
Over the 26 years of our sample there are some good years for MBA students and there are also some tougher years. Career options for MBA students may be restricted by the prevailing economic conditions. During good years MBA students are likely to receive more job offers which would allow students to choose a more optimal starting job. Similarly, in recession years a tight labor market is likely to restrict students' options. It is not obvious whether the patterns we have documented thus far are consistent during good and bad economic times and we might expect them to be slightly different if MBAs have less freedom to choose their workplace.

Following Oyer (2008), we define good and bad periods for new MBAs based on the return on the S&P 500 during the two-year period while the students are in the MBA program. Specifically, we define a student as graduating in a "boom" if the S&P 500 increases by more than 20% from July 1 of the year the person enters the program through June 30 of graduation year. We say a student graduated in a "bust" period if the S&P return is less than 20% in this two-year period. This categorizes eleven of the twenty-six graduating classes as "bust" classes and the other fifteen as "boom" classes.

Figure 5 reproduces the top left graph in Figure 4, showing returns in the year before and after graduation. But we now separate new MBAs into boom and bust groups. The graph shows that, while the level of returns is obviously different for the two periods, the returns relative to the market are consistent. In either good times or bad, students go to work for firms that have raw returns that are greater than those of the broader market in the year before and after graduation. These firms have positive excess returns in the period leading up to graduation and roughly zero average excess returns in the year after graduation, regardless of the state of the overall market.[4]

[4]Again, these results are consistent for the year leading up to and after June of the summer in which MBAs intern.

Figure 5: Performance during Booms v. Bust (Full Time positions)



Note: Figure depicts results using the rolling CAPM estimates. Results are similar using the rolling Fama French model.

The patterns in Figure 5 indicate that students are no better at picking "winners" in good times or in bad times. Regardless of the state of the overall market, they go to firms that have been outperforming the market in the time leading up to the new jobs starting and they roughly parallel market returns in the year after. This means that, when students have a wider choice of job options ("boom" periods), they are no more likely to pick a "winner" than when they have a more limited set from which to choose. It also means that neither the ability to attract new MBAs in more competitive ("boom") periods nor demanding new MBAs when others do not ("bust") predicts anything, on average, about a firm's performance relative to the broader market.

So, while the low returns of firms that recruit but fail to hire are suggestive that students' choices drive the relationship between hiring and the high returns during recruiting, the fact that this relationship is stable across boom and bust periods suggest it is driven more by firms' labor demand. Further work is required to better parse out the supply and demand effects.

5.2 Is it Just the Industry?

MBAs go to work for firms that are doing well. Is that because they choose (and are chosen by) firms that are performing well or do they simply go to work in industries with relatively good fortunes? We address that issue in this section by comparing the returns of the industries in which MBAs take jobs to the overall market return and by comparing returns of individual firms where

MBAs work to their industries' returns.

To do this, we use all firms that are int he merged CRSP/Compustat dataset to generate industry indexes by two-digit SIC codes. For each month, we calculate the average return for all stocks and the average return for all stocks in each two-digit industry. We drop industries in any given month for which we do not have least six firms from which to calculate an index. We have done this both on an equal-weighted and value-weighted basis and the results are similar both ways. So we focus on equal-weighted indexes.

We run the simple CAPM (one factor) model for each industry. That is, we calculate

$$R_{ij} - Rf_j = \alpha_{it} + \beta_{it}(Rm_j - Rf_j) + \epsilon_{ij}. \tag{2}$$

for each industry, i, in each month, j.

Then, similar to our earlier graphs of individual firm returns, we mimic an investment of \$1 in the industry index corresponding to the job taken by each MBA. We calculate the cumulative returns of the industry in the year leading up to the MBA taking a job there and the year after the MBA starts the job. Figure 6 shows the returns for the market average, for the industry indexes (weighted by how many MBAs take a job there), and the risk-adjusted excess return of the industry relative to the market.

The graph shows several noteworthy differences compared to the corresponding graph for individual companies (Figure 6). The returns of the industry and the overall market are almost exactly identical, on average. However, while the individual firms that MBAs go to have, on average, high betas, the industry indexes of these same firms are, on average, less than one. As a result, though the raw returns are the same for the index and the market as a whole, the risk-adjusted returns of the industry indexes are positive.

So, in the year leading up to MBAs taking a full-time job, the firms they will join are outperforming the market, *despite* the extra risk they impose *and* the industries of these same firms are outperforming the market *because* they have similar returns at lower risk. (Figure 6) also shows that, unlike the individual stocks, the industry returns are similar in the year before and the year after graduation. This suggests that, over the period we study, MBAs go to work for firms in industries that are doing well over a sustained period but that, within these industries.

Within these industries, we find no evidence that MBAs sort into firms that are doing particularly well at a given time, however, as seen in (Figure 7). This graphs shows the industry return, the individual return, and the excess return, all weighted by the number of students going to work in a given firm or industry in our sample. It appears that the firms MBAs go to perform about as well as their industry in the year before and after hiring. The cumulative excess returns do not

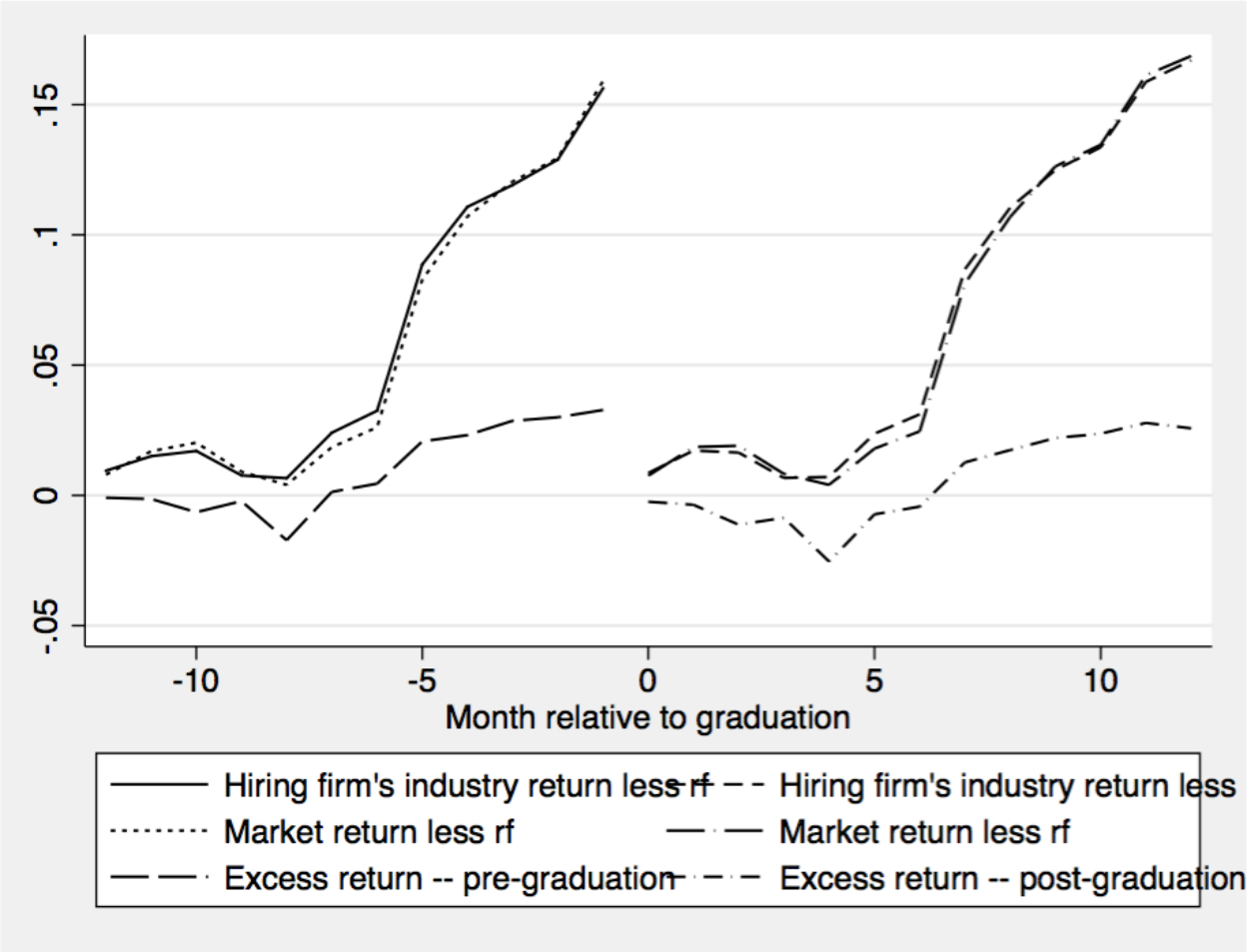


Figure 6: Performance of Industries MBA Graduates Join Full Time.

differ from zero for either period.

5.3 How Do Firms That Hire MBAs Compare to Firms that Hire Others?

We have shown that firms that hire MBAs, at least those from one leading program, outperform the rest of the stock market in the year leading up to the time of the hiring, are higher risk (higher beta) than the rest of the market, and have risk-adjusted returns on par with the market in the year after the MBA is hired. (Belo, Lin, and Bazdresch (2013)), using a comprehensive dataset of all firms in CRSP, come to seemingly very different conclusions about firms that hire employees more generally. First, they find that firms that do relatively more hiring in a given year have noticeably negative returns (relative to the market) the following year. Second, they find that some of this can be explained by the fact that firms with low hiring rates have higher market risk and, therefore,

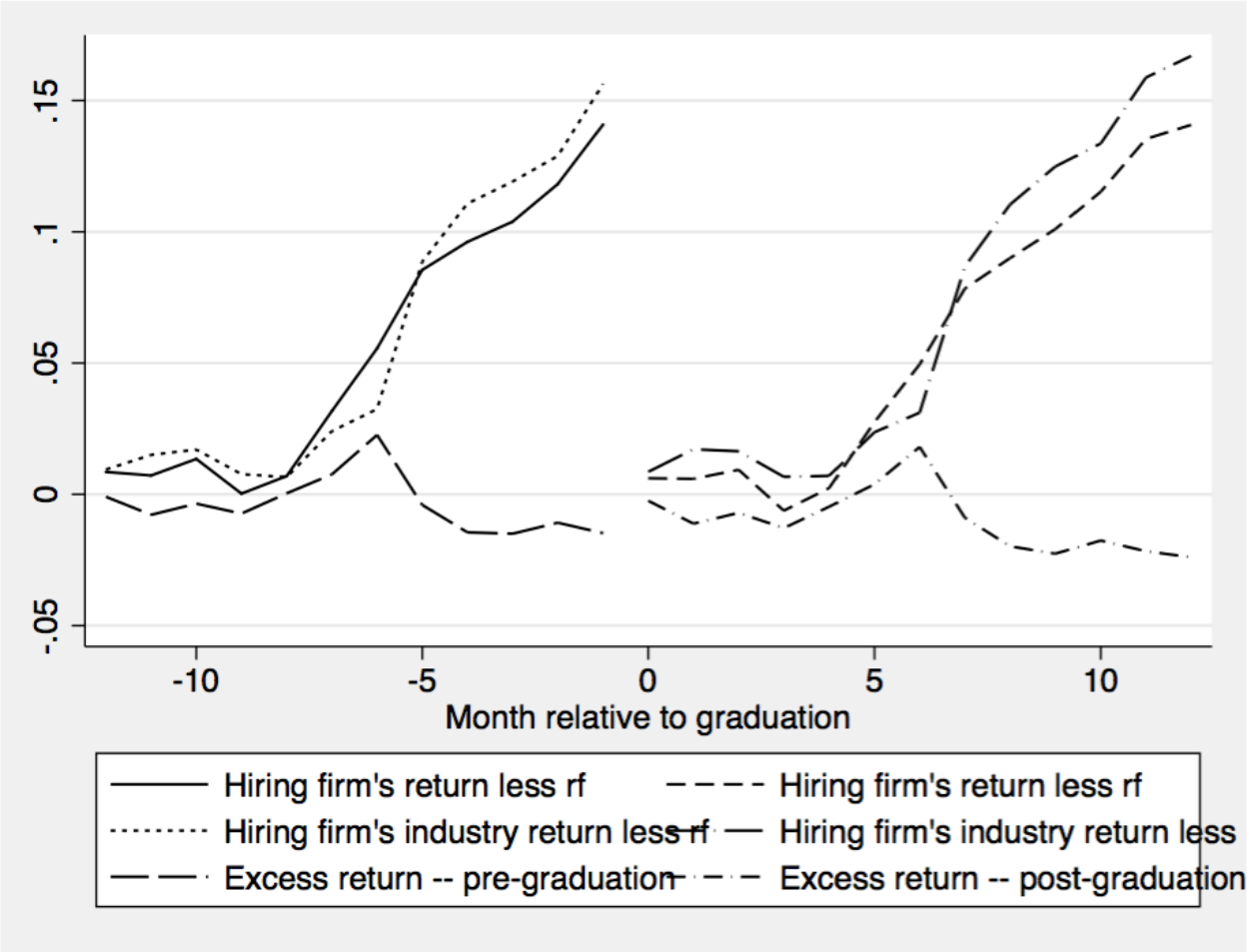


Figure 7: Performance of Firms MBA Graduates Join Full Time Relative to their Industries.

have to earn a larger risk premium. That is, they find that hiring in year t predicts low stock returns in year $t+1$ and that firms that hire many people are, on average, low beta firms. This suggests noteworthy differences between firms hiring MBAs and those hiring other employees given we found that firms hiring MBAs have high market risk and no excess returns in the year after hiring.

To explore this in more detail, we now carry out similar analyses to those we have done for MBA hiring on a broader sample of firms. We use all firms in the CRSP/Compustat merged dataset for the same years as our MBA analysis (1980-2005). We generated a dataset of monthly stock returns for each firm, limiting the sample to firms with a calendar fiscal year for consistency. We then broke the firms into quartiles based on their annual employment growth (fractional increase in employment) in a given year, adjusted for year fixed effects. Companies in the bottom quartile all decreased their employment, those in the second quartile decreased employment slightly or held

employment essentially steady, those in the third quartile increased their employee base modestly, and the fourth quartile consists of companies that increased their employment by more than ten percent from one year to the next.

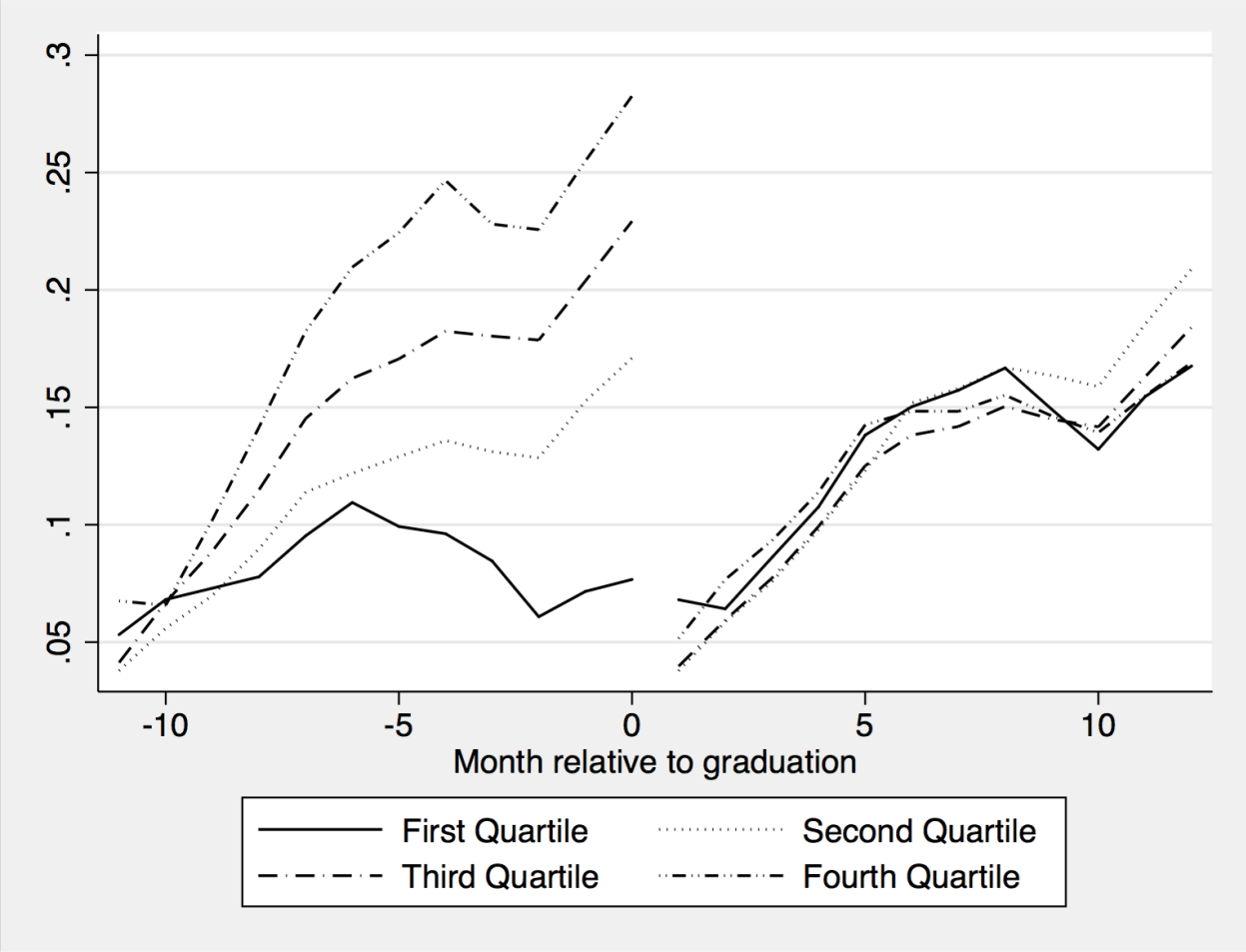


Figure 8: Performance of Firms by Employment Growth

Figure 8 shows the stock returns for firms in the four quartiles. The graph is centered around the end of the fiscal year (which is always December 31 in this sample) for year *t*. The graph shows, on the left, the cumulative stock return during year *t*. Remember that the quartiles of employment growth are based on this same fiscal year ("year *t*"). The right side of the graph shows the cumulative stock return during year *t+1*.

As with our MBA sample, stock returns are higher for firms that are doing more hiring in the year they are doing the hiring. Stock returns are, on average, correlated with stock return in the year of hiring. The firms in the top hiring quartile have the highest stock return, the second highest quartile has the second highest returns, and so on. While these are raw returns, not adjusted for

risk, the difference across the quartiles is quite dramatic. The typical firm in the top hiring quartile outperforms the typical firm in the lowest hiring quartile by approximately 25% over the course of year *t*. Top-hiring firms outperform the average firm by about 10%, suggesting that knowing in advance that a firm will go on such a hiring binge is even more valuable than knowing in advance that the firm will hire an MBA.

The right side of the graph shows a very different story for these firms in year *t+1*, however. The raw returns are not dramatically different across the quartiles and the differences, to the extent that they exist, are not obviously correlated with employment growth. The highest returns are in the two middle quartiles. Note that these are raw returns at this point – we do not yet have the market models run at the firm level so there could well be differences across quartiles once we adjust for standard market factors.

Overall, Figure 8 suggests more similarities than differences in the stock performance of firms hiring MBAs and those hiring other workers. Strong relative stock returns in the period leading up to and right around hiring are followed by returns that, on average, mimic the overall market in the period after hiring.

We now attempt to more closely replicate our "invest $1 in each new hire" strategy from Figure 4 for the broader sample of firms we used in Figure 8. For all the firms in our CRSP/Compustat sample, we define the number of workers hired during year t as the number of workers at the firms at the end of year t minus the number at the firm at the end of year *t-1*. We then mimic investing $1 per worker hired in each firm at the start of year t and again at the start of year *t-1* (that is, at the end of year t).

There are some challenges to this analysis, however, that we have not fully resolved at this point. First, many firms have negative employment growth. We could short these firms $1 for each employee lost but, for now, we simply drop these firms. Second, large firms dominate this analysis. If a firm with 100,000 employees grows by 2%, our "investment" in this firm is twice that of a 1,000 employee firm that doubles in size. Third, many of the largest firm/year employment growth observations are driven by mergers of large companies rather than actual hiring. For example, Bell Atlantic "grew" by over 100,000 employees in 2000 when it merged with GTE to form Verizon. Mergers between AT&T and BellSouth and between Citigroup and Traveler's create similar erroneous employment growth. For now, we try to minimize the impact of these mergers by dropping observations where a firms employment grows by more than 50% in a year.

The results of our preliminary attempt to invest $1 in each new employee hired is shown in Figure 9. As this graph shows, the portfolio we created is dominated by firms that underperform the market both before and after the year the employee is hired. Returns on this portfolio are

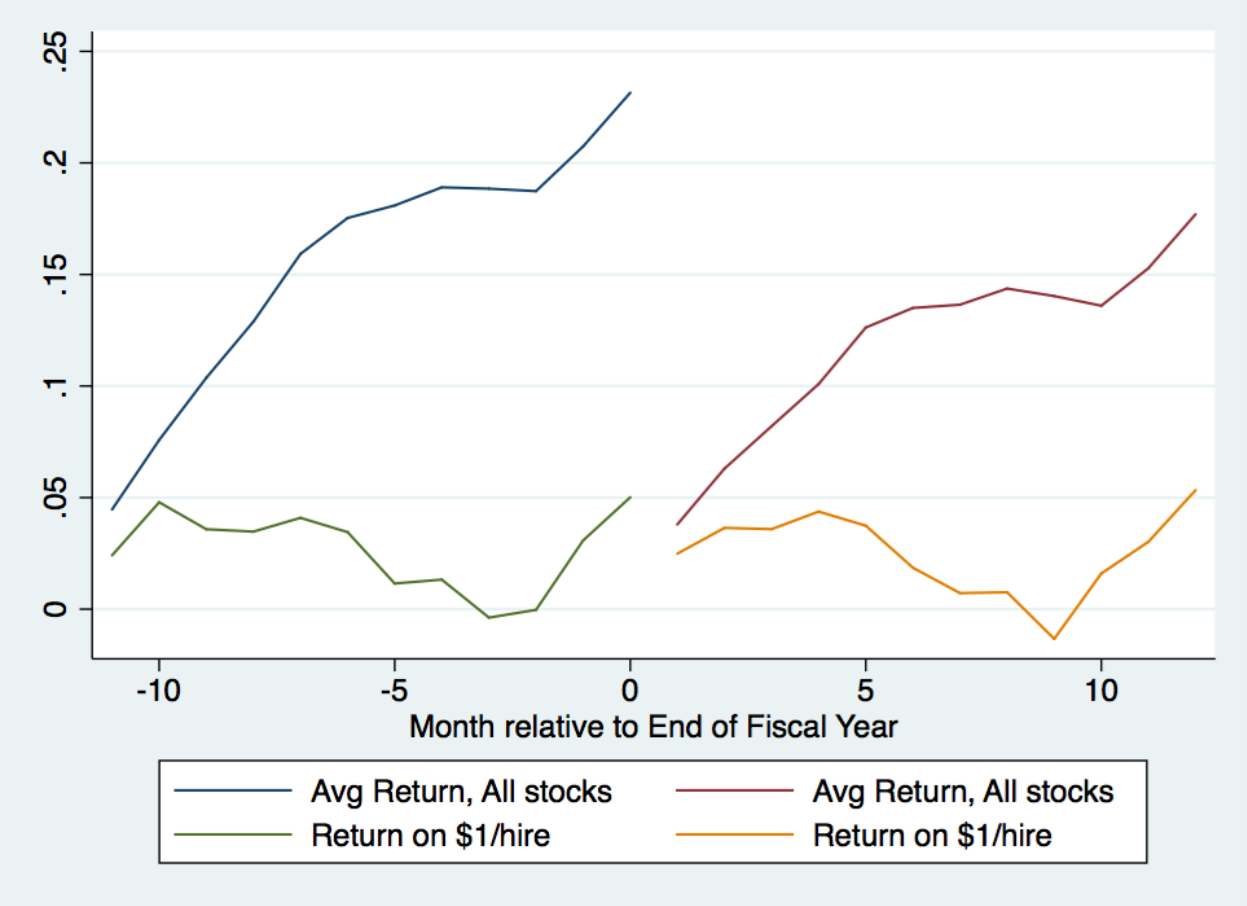


Figure 9: Return on Investment in New Hires

essentially zero, which is far below the market average of about 20% during this period. Though this analysis requires more refinement, it suggests that, not only could hiring be a bad indicator for a firm's stock price as per (Belo, Lin, and Bazdresch (2013)), but weighting by people may exacerbate this negative relationship.

5.4 Properties of Firms that Hire MBAs and Others

We now look at the stock market and accounting properties of firms that hire MBAs relative to other firms and relative to firms that hire other types of workers and ask what we can infer about the properties of firms that hire MBAs.

Table 3 shows averages for firms in our MBA recruiting sample. For consistency, we only look at firms with calendar fiscal years. The first column sample includes all firm/years where the firm successfully hires a full-time or Summer employee, the second column uses the same sample but

weights by the number of students hired, and the third column includes firm/years where the firm engaged in on-campus MBA recruiting but did not hire any full-time or Summer employees. The first three columns cover the fiscal year that ends in December of the school year in which the recruiting occurs while the last three columns show the following fiscal year (that is, from the January before the end of the school year through the December following the school year.)

The first four rows of the table show average ROA, employment growth, stock return, and stock volatility while the bottom four rows show these same variables after taking out fixed year and two-digit SIC code effects.

The stock return figures just lay out the same message as the prior analysis. The ROA averages show that firms that hire are more profitable than those that recruit but do not hire and, because hiring firm profitability is a bit lower in year *t+1*, firms hire more in years when their own profitability is relatively high. So part of the relationship between hiring and stock returns appears to be driven by a relationship between profitability and hiring. That is, the fact that the stock return and profitability numbers are similar may suggest that, when firms have more profits, their stock price rises and they hire more people.

Firms that hire more MBAs also are hiring more workers generally, given that employment growth is higher for firms that successfully recruit than those that do not and that employment growth is lower in the year after MBA hiring than in the year the MBAs are hired. Note that the stock volatility is not different among hiring firms and those that do not successfully hire.

To get a better sense of how the MBA hiring firms compare to other firms, we now compare these same variables to the entire sample of firms that are in the matched CRSP/Compustat data in the years of our MBA sample. Table 4 shows the same information as in Table 3 for this broader group of firms. We divide the sample into quartiles based on employment growth in a given year and then we show the same sample in the year where we create the quartiles (year t) and the following year (year *t+1*). We combine the middle two quartiles so the table shows the bottom quartile, the middle two quartiles, and the top quartile, in terms of employment growth.

By construction, employment growth is quite low (an average of 20% decline) in column 1 and high in the third column. In the following year, there is substantial mean reversion. Growth is equally high for the two extreme quartiles as the top quartile grows much more modestly and the bottom quartile appears to make up for some of the prior year's contraction.

Note that stock returns in the year where we measure hiring are increasing in the hiring rate. Firms that hire the most have the highest return and firms that hire the least have the lowest. However, consistent with Belo, Lin, and Bazdresch (2013), the highest growth firms underperform the middle quartile the year following the hiring. Our table indicates that the lowest hiring quartile

also has modest returns.

Unfortunately, some firms are outliers that complicate the means of profitability and volatility, making it difficult to accurately analyze the patterns in these variables. We will clean up these outliers as we continue to refine our analysis.

Table 3: MBA Recruiting Firms

	(1) Year t			(2) Year t+1		
	MBA: Unweighted	MBA: Weighted	Recruit no Hire	MBA: Unweighted	MBA: Weighted	Recruit no Hire
Returns	0.0160	0.0160	0.0119	0.0139	0.0133	0.0152
	(0.101)	(0.0997)	(0.101)	(0.102)	(0.101)	(0.0958)
ROA	0.0601	0.0657	0.0540	0.0570	0.0629	0.0497
	(0.0860)	(0.0728)	(0.0931)	(0.121)	(0.0860)	(0.104)
Emp Growth	1.081	1.075	1.042	1.067	1.064	1.029
	(0.333)	(0.256)	(0.196)	(0.297)	(0.270)	(0.214)
Volatility	0.0883	0.0866	0.0851	0.0853	0.0863	0.0861
	(0.0524)	(0.0480)	(0.0411)	(0.0495)	(0.0493)	(0.0477)
Adjusted Returns	0.0208	0.0197	0.0168	0.0193	0.0185	0.0207
	(0.0989)	(0.0973)	(0.0992)	(0.0992)	(0.0981)	(0.0948)
Adjusted ROA	0.0657	0.0817	0.0681	0.0637	0.0787	0.0699
	(0.0809)	(0.0623)	(0.0837)	(0.114)	(0.0694)	(0.0986)
Adjusted Emp Growth	1.226	1.224	1.147	1.219	1.221	1.141
	(0.256)	(0.191)	(0.179)	(0.232)	(0.213)	(0.202)
Adjusted Volatility	0.0723	0.0745	0.0849	0.0721	0.0747	0.0843
	(0.0379)	(0.0310)	(0.0289)	(0.0346)	(0.0304)	(0.0378)

6 Conclusions

We analyzed the stock returns of firms that hire new graduates of MBA programs and MBA students doing Summer Internships. We showed that investing money in the firms that hire these students in the year leading up to the student taking the job would be a profitable trading strategy if it were feasible. But investing in these firms starting at the time of graduation is not as valuable – firms outperform the market in the year after students start these jobs but only because the firms have relatively high betas. These results are consistent for full-time hires and Summer Interns, as well as during good and bad periods in the stock market and the broader economy. We also showed suggestive evidence of an anomaly whereby firms that recruit MBAs and do not successfully hire any outperform the market in the subsequent year.

Next steps in this paper include:

- Build a model of job choice by new workers and/or recruiting by firms to motivate and guide the empirical analysis.

Table 4: CRSP and Compustat Firms

	(1) Year t			(2) Year t+1		
	Lowest Quartile	Middle Quartiles	Highest Quartile	Lowest Quartile	Middle Quartiles	Highest Quartile
Returns	0.00579	0.0150	0.0186	0.0113	0.0148	0.0129
	(0.626)	(0.133)	(0.191)	(0.205)	(0.429)	(0.168)
ROA	-0.0925	-0.0354	-0.00576	-0.188	0.0145	-0.0220
	(1.216)	(10.19)	(0.537)	(15.05)	(0.240)	(0.559)
Emp Growth	0.801	1.029	2.047	1.244	1.122	1.271
	(0.181)	(0.0568)	(12.52)	(5.293)	(5.070)	(7.546)
Volatility	0.153	0.108	0.145	0.150	0.112	0.138
	(0.610)	(0.0788)	(0.131)	(0.148)	(0.417)	(0.0957)
Adjusted Returns	-0.0131	-0.00520	0.00338	-0.00430	-0.00521	-0.00667
	(0.623)	(0.134)	(0.189)	(0.205)	(0.427)	(0.167)
Adjusted ROA	-0.0159	0.0186	0.0929	-0.110	0.0725	0.0637
	(1.643)	(9.928)	(1.861)	(14.62)	(1.264)	(1.669)
Adjusted Emp Growth	0.470	0.726	1.691	0.900	0.818	0.936
	(1.330)	(0.952)	(12.14)	(5.350)	(4.859)	(7.532)
Adjusted Volatility	0.136	0.103	0.127	0.133	0.106	0.122
	(0.577)	(0.102)	(0.138)	(0.169)	(0.395)	(0.108)

- More closely relate this to prior work on individual risk choices over the life cycle.
- Carefully investigate and document differences (and reasons for differences) between firms that hire MBAs and firms that hire other workers.

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