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The Making of an Investment Banker: Stock Market Shocks, Career Choice, and Lifetime Income

PAUL OYER*

ABSTRACT

I show that stock market shocks have important and lasting effects on the careers of MBAs. Stock market conditions while MBA students are in school have a large effect on whether they go directly to Wall Street upon graduation. Further, starting on Wall Street immediately upon graduation causes a person to be more likely to work there later and to earn, on average, substantially more money. The empirical results suggest that investment bankers are largely "made" by circumstance rather than "born" to work on Wall Street.

> Back in January 1987 . . . Wall Street was booming. . . When the job offers rolled in, students played one house against another. They were the supply, and the demand was strong. . . After the crash, the receptions that had once played to packed houses were drawing a few dozen students. Out went the tenderloin on toast and the shrimp; in came the dips and the hot dogs on toothpicks. The school placement office sent out a memo suggesting career 'flexibility' for finance majors like me; we should look into opportunities in manufacturing and consulting. (Brown (1988))

INVESTMENT BANKERS ARE CRITICAL FIGURES in financial markets. They are involved in virtually all large financial transactions, including mergers and acquisitions, initial public offerings, and other securities offerings. The business press, discussions in classrooms and hallways at leading business schools, and even movies and novels suggest that investment bankers are well compensated for their efforts. But how do these people who have such an important influence on financial markets get into their positions? Are some people endowed with great financial acumen, honing these skills in college and MBA programs on their inevitable progression to a career on Wall Street? Or are there many

*Paul Oyer is at the Graduate School of Business, Stanford University. I thank Ken Corts, Vicente Cunat, Liran Einav, Eric Forister, Campbell Harvey, Dan Kessler, David Robinson, Kathryn Shaw, Andy Skrzypacz, Ilya Strebulaev, Till von Wachter, Jeff Zwiebel, anonymous referees, and seminar participants at Berkeley, Chicago, Dartmouth, Middlebury, IZA/SOLE, Gerzensee, and the AFA meetings for comments. I thank Ed Lazear for both sharing the MBA survey data and providing useful suggestions. I am also grateful to Stanford's Vic Menen and Andy Chan and to Wharton's Christopher Morris and Jennifer Sheffler for providing historical placement information for their schools and to Kenneth Wong for research assistance.

skilled people whose abilities would be valuable in almost any type of work and who end up on Wall Street due to unpredictable events? Using a data set of graduates from Stanford University's Graduate School of Business, I address the issue of whether investment bankers are "born" or "made." I document the large compensation premium for investment bankers and use the career progressions of MBAs to draw conclusions about the sources of the investment bank compensation premium.

I show that, just as investment bankers are key drivers of financial markets, shocks in financial markets have important and lasting effects on the careers of investment bankers. Specifically, using data from a 1996 and 1998 survey of several thousand Stanford MBAs, I find that stock market conditions while MBA students are in school have a large effect on whether they go directly into investment banking upon graduation. This effect of the markets on initial MBA placement turns out to be a lasting determinant of career choice and earnings. Using market conditions at graduation as instruments for initial career choice, I show that taking a position on Wall Street leads a person to be much more likely to work on Wall Street later in his or her career. I then estimate how shocks that lead people to either start their careers on Wall Street or elsewhere affect the discounted long-term financial value of their compensation. I estimate that a person who graduates in a bull market and goes to work in investment banking upon graduation earns an additional $1.5 million to $5 million relative to what that same person would have earned if he or she had graduated during a bear market and had started his or her career in some other industry.

The analysis leads to several conclusions about the labor market for investment bankers. I argue that the patterns of movement in and out of investment banking, as well as the compensation premium estimates, are consistent with a model in which investment bankers are made by circumstance rather than being born to work on Wall Street. The compensation premium for investment bankers, which is quite large even in this elite and highly skilled group of MBA graduates, appears to be a compensating differential for the hours, risk, travel, and other factors that go with working on Wall Street. The evidence is not consistent with investment banker pay simply reflecting a skill premium. The results also suggest that investment bankers develop finance-specific human capital while still at Stanford and shortly after taking jobs on Wall Street. I am not able to identify the sources of this specific capital, however, which could include development of finance skills, development of networks, or even simply getting accustomed to the standard of living that goes with high pay.

These results also shed light on how financial markets are affected by, and affect, the people who work in them. Random factors in financial markets determine, at least to some degree, who will make those markets in the future. While it is well known that market shocks have large effects on the wealth of those who buy and sell in those markets, I show that market shocks also have large and persistent wealth effects by determining where people will work and how much they will make. This implies that young professionals or students hoping for careers in finance should get into the industry as early as they can and should consider hedging their financial assets while in school because they can

expect financial market performance while they are in school to be correlated with their future earnings.

The paper provides insights into a large and growing sector of the economy, as well as an area where, due to teaching responsibilities, finance scholars have a relatively large impact. Several prior papers on areas within the broader investment banking community hint at possible reasons for the strong persistence in finance careers that I demonstrate below.[1] For example, Hochberg, Ljungqvist, and Lu (2007) show the importance of networks in venture capital and Kaplan and Schoar (2005), Brown, Harlow, and Starks (1996), and Chevalier and Ellison (1997) find that success leads to investor inflows in private equity funds and mutual funds. These results all suggest that experience within these areas can be quite valuable and increase these finance professionals' private returns to staying in these businesses. Others have shown the value of bundling financial services (see, for example, Schenone (2004), Lin and McNichols (1998), and Michaely and Womack (1999)), so finance-specific human capital may also be built through developing a network within one's own firm. An additional explanation for persistence in the financial sector is provided by Chevalier and Ellison (1999). They show that long-term career concerns affect mutual fund manager behavior, which suggests that these managers value staying within this sector and take actions to increase their tenure in the industry. Finally, Chen and Ritter (1995) suggest that fees are high and competition is low in investment banking. If there are substantial barriers to entry, then getting a job in this industry when openings occur may permit a new MBA to collect substantial rents over the rest of his or her career.

The rest of the paper proceeds as follows. The next section lays out the theoretical background for why initial placement might have long-term implications. Section II describes the data and Section III analyzes how initial MBA placement is affected by stock returns. Section IV documents a causal effect of initial MBA placement on Wall Street on the likelihood of working there as the person's career develops. Section V estimates the amount of discounted lifetime labor market income that exogenous shifts into or out of Wall Street careers create for affected individuals and for MBA cohorts as a whole. Section VI concludes with a summary and suggestions for future research.

I. Theoretical Background

Investment banks compete with firms in other sectors of the economy when hiring. Graduating MBAs and other students often interview for positions in investment banking and other industries. To formalize a simplified version of this idea, consider a labor market with two sectors, the investment banking

[1] This paper also extends the cohort effects literature in labor economics, which has shown that random macroeconomic shocks early in careers can have long-term effects. Examples that consider this issue from various perspectives include Kahn's (2006) study of a representative sample of U.S. college graduates in the classes of 1979–1988, Oyer (2006) on the careers of economists, and Baker, Gibbs, and Holmstrom (1994) on cohort effects within a single large firm in the service sector.

(IB) sector and the general sector, denoted "f," for financial, and "g," respectively. Assume that, subject to expending some search effort, any MBA can find employment in either of these two sectors immediately after graduation. Then, as the person graduates, he compares the expected utility streams from each of these sectors over the course of his future career. Let $u^f(w_f^0)$ be the expected utility, as of career year 0 (that is, upon graduation), of a career that starts in the IB sector. The function captures the person's disutility of effort in investment banking. The w term captures the income stream he can expect from a career that starts in that sector and reflects expectations about the job he believes to have the highest expected utility among his options in this sector.[2] Similarly, let $u^g(w_g^0)$ be the expected utility from his best option in the general sector.

Naturally, the student will start in the IB sector if $u^f(w_f^0) > u^g(w_g^0)$. As a result of heterogeneity in MBAs' preferences, though the marginal graduate is indifferent between the two sectors, some (perhaps nearly all) graduates expect to strictly prefer the sector they choose. The state of the stock market is likely to have a larger marginal effect on expectations about w_f^0 than income in the general sector because favorable conditions on Wall Street will increase demand for labor and expected pay. Also, under the standard assumption that stock returns follow a random walk, any short-term change in stock market conditions should increase long-term expectations about the level of stock prices.[3] Therefore, given that a bull market will increase $u^f(w_f^0)$ relative to $u^g(w_g^0)$ for some MBAs (and not decrease it for any), more people will choose IB jobs in classes that graduate when stock prices and returns are relatively high.[4]

The question of interest, however, is whether this initial effect of a bull market on industry choice is persistent. At year t, a person who took an IB position upon graduation faces expected utility from staying in the financial sector of $u^f(w_f^t)$. He can also switch to the general sector where he can expect utility of $u^g(w_g^t)$. There are reasons to expect that if $u^f(w_f^0) > u^g(w_g^0)$, then $u^f(w_f^t)$ will be greater than $u^g(w_g^t)$. That is, people who show an initial preference for the IB sector are likely to find the work there relatively pleasant and one would expect that to be the case later. There are two underlying models (or classes of model) that would predict those who start in the financial sector are more likely to work there later on, each of which has distinct empirical predictions:

Model 1: "Investment Bankers Are Born". Suppose that there are two types of people who are interested in starting their careers in investment banking. The first type, "bankers," will be highly productive investment bankers because their skills match the production function well. "Nonbankers" have a

[2] The person can change sectors. So, w reflects the income in both sectors and the person's expected probability of working in each sector at any given time in the future.

[3] In addition, if MBAs make career decisions assuming momentum in stock prices (which would be consistent with the retirement allocations studied by Benartzi (2001)), then high stock returns would encourage them to be more inclined to take a job on Wall Street.

[4] High returns will not necessarily increase IB sector expected utility if risk increases. In the empirical section, I will address this by considering how volatility, as well as returns, affect sector choice.

high marginal utility for money (and so seek the highest paying job possible no matter their skills). When times are lean on Wall Street, the second type shows less interest in working there (that is, the expected value of w_f is lower so they consider alternatives). When conditions improve, IB firms are reluctant to hire those who did not start their careers on Wall Street because they have revealed themselves to be unproductive investment bankers. But, when hiring new MBAs, they have no method for separating the productive bankers from the nonbankers. After some time working on Wall Street, the nonbankers are revealed (after a period of enjoying a high income) and they are either fired or choose to move to the general sector. This model predicts that bankers end up in banking and nonbankers do not, no matter when they enter the market. Therefore, though it implies that there would be a *correlation* between starting in banking and working there subsequently, there is no *causal* effect of first job on subsequent jobs.

Model 2: "Investment Bankers Are Made". Suppose there is a large pool of MBAs that would be productive investment bankers.[5] Much of this pool is nearly indifferent between the two sectors, given the expected income differences over time. However, anticipating IB opportunities, those who go to school during bull markets develop Wall Street-specific skills both in school and at the beginning of their post-graduation careers.

To be a little more concrete, consider the model in Gibbons and Waldman (2006). They model "task-specific human capital" and show that it can lead to long-term effects of initial job placement on the types of jobs workers hold. In their model, those hired under favorable conditions are initially given high value tasks and develop more valuable human capital that persists throughout their careers. These specific skills may widen the gap between w_f^t and w_g^t as a career in the IB sector continues (that is, as t increases).[6]

IB-specific human capital would lead those who go to Wall Street to be relatively productive there and would lead to a causal link between starting a career on Wall Street and working there later on.[7] If potential investment bankers are homogeneous, then those who go to Wall Street during bull markets would not be noticeably different from those who go to Wall Street during bear markets.

[5] This group need not be the entire MBA class, but enough to meet hiring demands during bull markets.

[6] While I will discuss specific human capital as though it is a productivity investment, it could simply be the result of lower transaction costs. For example, models in which incumbent firms have more information about an individual than other potential employers (such as Akerlof (1970)) or pure search cost models would lead to "stickiness" in choice of industry. The cost of search, any cost of switching industries, or aversion to the risk of unknown features of the general sector will lower $u_t^g(w_g)$ for any employee in the financial sector in the same way that specific finance skills raise $u_t^f(w_f)$. Another related alternative with the same implications is that, as workers get accustomed to a job, the disutility of effort may decline.

[7] As Hart and Moore (1994) note, the specific investments literatures in labor economics and finance are closely related. In Model 2, the investment banker is tied to an industry rather than a firm. While this eliminates the potential for specific investments to lead to the hold-up problem (see Hart (1995), chapter 2), it means that MBAs that go to Wall Street find their wealth increasingly tied to financial markets over time.

As a result, even though the entering pool of bankers would be larger in bull markets, they would not be any less prone to success in banking than those who choose to go to Wall Street during a bear market (in stark contrast to Model 1). This leads to the empirical prediction that those hired during bear markets would be as likely to stay in investment banking as those hired in bull markets and that those hired in bull markets would be no less able (in terms of IB training and interest) than those hired in bear markets.

It seems unlikely that the world is as stark as either of the two models just sketched. If bankers are born to some degree (that is, there is some heterogeneity in how well MBAs are suited to work in banking) and made to some degree (that is, they develop Wall Street-specific skills), then the marginal MBA hired during a bull market would be less fit for a career in banking than one hired in a bear market but would become more fit for the IB sector over time. Therefore, if bankers are both born and made, I would expect to find that those who start their careers on Wall Street will be more likely to work there later on (even controlling for ability or fit) and that new MBAs who go to Wall Street during bull markets will be, on average, less fit for careers in banking than new bankers who graduate in bear markets.

In the sections that follow, I investigate the predictions of these models. First, I show that new MBAs are more likely to go to Wall Street during bull markets, which is an important implication of both models. Second, I show that those who go from Stanford Business School directly to Wall Street are more likely to work on Wall Street later in their careers, which is also consistent with both models. However, I find no support for the notion that those who take jobs on Wall Street after graduating in bull markets are less interested in or tied to Wall Street, which provides evidence against the model that predicts investment bankers are born. Then, using Wall Street conditions while MBAs are in school as an instrument for first job, I show that the link between initial placement and later employment on Wall Street is causal in the sense that an MBA who starts on Wall Street is more likely to work there later *because he started his career there*. This implies that investment bankers are made, at least to some degree. The evidence suggests that random factors play an important long-term role in MBA careers, that investment bankers are made through specific IB investments, and that the premium for working in the IB sector is a compensating differential for the work rather than a skill premium. I then go on to measure the magnitude of the effects of these random shocks.

II. Data

The data are from a mail-based survey of Stanford Graduate School of Business (GSB) alumni. The survey was conducted in 1996 and 1998 and had a response rate of approximately 40%. Survey respondents provided detailed job histories, including jobs before they entered Stanford's MBA program. I use information gathered from members of the GSB classes of 1960–1995. I dropped any job where the person worked less than half time. If the person reported two jobs simultaneously, I use the one which he reports working a higher fraction of "full time."

Table I
MBA Sample Summary Statistics

"First Job" is the job the person held in the January after graduating. "Survey Job" is the job held when answering the survey in 1996 or 1998. "I-bank Jobs" is the subset of column 1 person-years where the respondent was employed for an investment bank, a money management firm, or a venture capital firm. "Employees" is the number of employees at the firm where the respondent worked.

	Total	First Job	Survey Job	I-bank Jobs
Female	11.6%	19.3%	19.0%	10.4%
Work in USA	86.1%	83.2%	83.2%	86.6%
Minority	7.3%	12.2%	11.9%	6.8%
Investment Banking	14.5%	14.2%	18.3%	100%
Consulting	10.7%	18.6%	13.6%	0%
High technology	10.6%	10.9%	12.0%	0%
Partner/Owner	24.9%	7.6%	31.4%	33.8%
Founder	11.4%	2.9%	15.9%	13.6%
Employees (median)	1,000	2,000	450	500
Salary > $50,000	77.8%	41.4%	93.4%	89.5%
Salary > $100,000	47.8%	5.6%	71.3%	76.1%
Salary > $500,000	9.0%	0.1%	13.7%	31.5%
Graduation year	1973.5	1980.4	1980.1	1975.5
Age	39.6	29.4	44.4	39.1
Total person/years	62,115	3,782	3,886	8,844

Table I provides summary statistics. Column 1 shows averages for all post-graduation person-year observations, column 2 provides details on each person's job the year after graduation, and column 3 summarizes the person's job at the time of the survey. Observations in this table and throughout the analysis are a snapshot of the person's job as of the end of January of each year.[8] As noted above, this group is not representative of the broader economy (even those with graduate degrees). I compare the Stanford sample to respondents in two representative Census Bureau data sets. Stanford MBAs are higher paid, much more likely to work in investment banking or consulting, and slightly less likely to switch jobs than other people who work in for-profit businesses and hold master's degrees.

Respondents also provided details on the industries in which they worked. I define investment banking (or, in some tables and figures, "I-bank") broadly to include investment banking, investment management, and venture capital. The final column of Table I provides information about all person-year observations within this industry. Men and nonminorities are slightly overrepresented in this group. Investment banking has become more common over time.

[8] Columns 1 and 4 include all relevant person-year observations for a given person while the middle columns include at most one observation per person. Because older people have, on average, more years of data, the data in columns 1 and 4 are weighted towards earlier graduates. Column 2 does not include people who were unemployed in the January after graduation and column 3 does not include those who were unemployed (usually due to retirement) at the time of the survey.

The income data have at least three limitations. First, the survey asked people their salaries. Individuals may have interpreted this question differently, with some including bonuses and the value of equity. The reported numbers are likely understatements of labor market earnings as a whole. Second, the survey asked for the beginning and ending (or current, if the person holds the job at the time of the survey) salary on each job. I primarily rely on the cross-section of income information at the time of the survey. Finally, the survey provided categorical answers to the income questions. Respondents could either say that the relevant salary was under $50,000, between $50K and $75K, between $75K and $100K, between $100K and $150K, between $150K and $200K, between $200K and $300K, between $300K and $400K, between $400K and $500K, between $500K and $750K, between $750K and $1 million, between $1 million and $2 million, and over $2 million. In the analysis that follows, I assume the person's income is the midpoint of the reported range and that it is $3 million if the person reports income greater than $2 million.

Despite these limitations, there are two indications that the data are reasonably accurate. First, the average starting salaries for the class of 1995 reported by the Stanford GSB career office is approximately equal to the average I calculate from the survey. Retrospective salary data may not be as accurate, but I only use the wages reported at the time of the survey. Second, the fraction of each class that the GSB career office reported taking an initial job in investment banking closely tracks the fraction of each class that I calculate using retrospective job information. For the GSB classes of 1976–1994 (the classes for which I have information from both the career office and the survey), the correlation between the fraction of the class starting in investment banking based on my calculations and on surveys by the career office at the time of graduation is 0.84. Both surveys are subject to some measurement error. But the fact that these two independent surveys agree closely on initial salary and initial industry is at least somewhat reassuring.

I matched each Stanford GSB survey respondent with data on stock market conditions near the time the person graduated. I define the 2-year S&P return for a given MBA class as the percentage change in the S&P 500 in the 2-year period through the end of June when the person graduates. This measure has the nice feature that, with very few exceptions, it is fully determined during the period after the person has decided to enter Stanford's MBA program. Though it is currently common for MBA students to accept offers well before the actual graduation date, I focus on classes graduating in 1995 and earlier when the recruiting season ran closer to graduation. I define the 2-year volatility as the variance in the S&P 500 daily return during this same 2-year period. I define the relevant market volume for a respondent as the percentage change in the number of S&P 500 shares traded in the calendar year before the person graduates relative to the previous calendar year. Finally, I use Mergerstat LLC's measure of all announced mergers and acquisitions (M&A) activity involving U.S. firms as either buyer or seller during the calendar year before the person

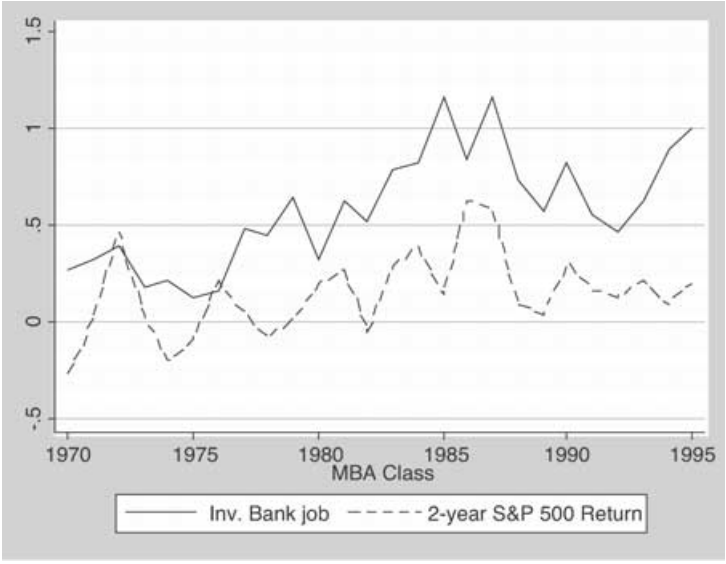

Figure 1. Stock returns during school and investment banking job placement. Solid line (Inv. Bank job) is the fraction of the Stanford GSB graduating class that works in investment banking in the January after graduation. Dotted line (2-year S&P 500 Return) is the 2-year return on the S&P 500 through the end of June in the year of graduation.

graduates. Details of how Mergerstat calculates this measure are available on its website.[9]

The final source of data is information in placement reports from the University of Pennsylvania's Wharton School, which are based on surveys of each graduating class conducted by Wharton's career office. I was able to obtain these reports for the Wharton classes of 1973–1995. For these years, I define a variable that is the fraction of each class that went into investment banking.[10]

III. Initial Job Placement

Figure 1 shows how the fraction of graduates whose initial placement is at an investment bank (normalized to one for the class of 1994) rises and falls

[9] To be specific, if a person is in the Stanford class of 1990, I use the M&A activity during 1989 as a measure of activity while the person is in school. I use the percentage change in S&P 500 share volume from 1989 to 1990 as the measure of volume. I use the standard deviation of daily returns from July 1, 1988 through June 30, 1990, and the total percentage return on the S&P 500 for this same period, as the measures of volatility and return.

[10] Because Wharton changed the way it reported (and, perhaps, the way it calculated) the fraction going into investment banking starting with the class of 1984, I include a "class of 1984 or later" indicator variable in any analysis where I use the Wharton career data.

with the 2-year return on the S&P 500 as of June of the year of graduation. The graph shows that the fraction of graduates taking jobs on Wall Street is at least somewhat responsive to recent stock market returns. The graph shows that graduates went to Wall Street in large numbers as the market boomed in the mid-1980s. After the market crash of 1987, however, there was a noticeable drop in the fraction of graduates going to Wall Street. While the swings in the fraction of the class going into investment banking were most noticeable around the 1987 crash, the relationship between investment banking and S&P returns is strong throughout and the results are not sensitive to dropping the graduating classes of 1986–1989.[11]

While Figure 1 demonstrates that there is a relationship between stock returns while students are in school and their first job, I will now be more precise in investigating this relationship as it forms the first stage of the instrumental variables analyses that follow. Define F_{it} to be an indicator for whether person i who enters the job market in year t starts his career in investment banking. Following the notation in Section I, $F_{it} = 1$ if $u_0^f(w_f) > u_0^g(w_g)$. F_{it} is observable in the survey data, so I estimate linear probability regressions of the form

$$F_{it} = \alpha\theta_t + \beta X_{it} + \varepsilon_{it}, \tag{1}$$

where θ_t is a measure of demand for MBAs in investment banking in year t, X is a vector of observable characteristics (linear, quadratic, and third-power time trends; gender; ethnicity; and whether the person ever worked as an investment banker before entering Stanford's MBA program), and ε_{it} includes unobservable individual characteristics that affect the demand by investment banks for the person's services and the person's preferences for working in investment banking relative to other industries.

Measures of market demand (θ) include the 2-year S&P 500 return through the end of June of the year the person graduates, volatility in this same period, volume growth, the Mergerstat index the year before graduation, and the fraction of the relevant graduating class from Wharton that initially placed in investment banking.[12]

The results are shown in Table II.[13] Panel A focuses on the S&P 500 to establish the basic relationship between stock returns and MBA placement, Panel B includes the other stock market variables, and Panel C adds Wharton placement. Column 1 of Panel A establishes the basic relationship between stock returns and MBA placement. It shows that in a year when the S&P 500 increases by 20% (one standard deviation) relative to another year, a typical Stanford

[11] Details on the initial placement of Stanford MBAs from the classes of 1997–2005, including industry and compensation details, can be found at http://www.gsb.stanford.edu/cmc/reports/index.html.

[12] The measures of θ do not vary within a graduating class, so all standard errors are clustered at the class level.

[13] Table II displays the results of linear probability (OLS) regressions that are the first-stage regressions in IV analyses below. The results (in terms of the significance of the estimates and the marginal effects of the coefficients) are nearly identical when using logit or probit specifications.

Table II

Initial Placement in Investment Banking

Coefficients are linear probability estimates (OLS), where the dependent variables are indicators for the person being employed in investment banking (including money management and venture capital) as of the January after graduation. Each regression also controls for gender, ethnicity (through indicators for Black, Hispanic, and Asian), year, year squared, and year cubed. "Pre-MBA I-bank" equals one if, before starting MBA studies, the person ever worked in investment banking. Regressions in columns 2 and 5 control for this variable in all panels. S&P return is through June of the year the person graduated. "Log(M&A)" is the log of the real value of M&A transactions involving U.S. firms in the calendar year before the person graduated from Stanford. "2-Year Volatility" is the standard deviation of the daily return on the S&P 500 through June of the year the person graduated. Volume is the percentage change in volume in the calendar year before the person graduated from the prior calendar year. "Wharton I-bank" is the fraction of graduating Wharton MBAs that took jobs in investment banking in the year the Stanford MBA graduated. The M&A and Wharton variables are only available for certain years, so the sample size is smaller. Standard errors (in parentheses) are adjusted for any correlation within graduating class.

	(1)	(2)	(3)	(4)	(5)
Panel A: S&P 500 Only					
2-year S&P return	0.1034	0.1052	0.0896	0.2063	0.2836
	(0.0345)	(0.0363)	(0.0386)	(0.0692)	(0.1017)
Pre-MBA I-bank		0.3712	Dropped	0.3506	Others
		(0.0254)		(0.0330)	Dropped
Sample (Pre-MBA)	All	All	Non-IB	Finance	IB
R^2	0.0353	0.1236	0.0172	0.1891	0.0567
N (People)	3,547	3,547	3,230	624	317
Panel B: Other Financial Market Variables					
Log($ M&A)	0.0747	0.0705	0.0527	0.0972	0.1686
	(0.0117)	(0.0123)	(0.0115)	(0.0240)	(0.0401)
2-Year volatility	−0.0690	−0.0797	−0.0780	−0.1479	−0.1168
	(0.0200)	(0.0206)	(0.0187)	(0.0483)	(0.0778)
ΔVolume	0.1111	0.1156	0.1119	0.2176	0.1454
	(0.0288)	(0.0281)	(0.0278)	(0.0819)	(0.1010)
Sample (Pre-MBA)	All	All	Non-IB	Finance	IB
R^2	0.0420	0.1347	0.0265	0.2029	0.0811
N (people)	2,943	2,943	2,637	600	306
Panel C: Wharton Placement					
Wharton I-bank	0.6319	0.6548	0.5545	0.4925	0.7612
	(0.1826)	(0.1799)	(0.2113)	(0.3320)	(0.4352)
Sample (Pre-MBA)	All	All	Non-IB	Finance	IB
R^2	0.0371	0.1363	0.0231	0.1993	0.0935
N (People)	2,410	2,410	2,119	559	291

graduate's probability of entering investment banking increases by about 2 percentage points. Given a base probability of 14%, this means that a one standard deviation increase in stock returns increases initial investment bank employment likelihood by about one-seventh. While the state of the stock market is certainly not the only factor that determines whether a person works in investment banking or not, it is an important predictor.

Column 2 shows that those who worked in banking before getting an MBA are much more likely than other students to work in investment banking immediately after graduating but that controlling for pre-MBA industry does not change the relationship between stock returns and first job. Column 3 limits the sample to those who did not work in banking before getting an MBA and shows a similar effect of stock returns on first job. Columns 4 and 5 limit the sample to groups that have already shown some interest in finance by the time they attend Stanford. Column 4 includes the 18% of the sample that worked in any type of finance job before getting an MBA (including investment or commercial banking, insurance, real estate, accounting, or other financial services) while column 5 limits the sample further to the 9% that were investment bankers before entering the Stanford GSB. The estimated effect of stock returns on these samples is noticeably larger than for the broader sample. This difference is to be expected because the unconditional probability of these groups going to investment banking immediately after graduation is larger and these samples drop the large group of people in a typical Stanford GSB class that would never seriously consider seeking a job in investment banking.

Panel B shows results from the same specifications, but uses other indicators of stock market conditions. The sample size is smaller in Panel B than in Panel A because the M&A variable starts in 1969. It seems natural to expect M&A activity and volume to be positively associated with initial IB placement, but the volatility relationship is less straightforward. On the one hand, volatility creates opportunities. On the other hand, $u^f(w_f^0)$ is a risk-adjusted notion and potential bankers will likely shy away from risk, all else equal. On the labor demand side, banks may be reluctant to hire when there is volatility due to the costs of downsizing. Column 1 shows that an increase in the M&A measure by one standard deviation (0.65) is associated with nearly an additional 5% of Stanford graduates going into investment banking. A one standard deviation increase in volatility (0.29) leads to 2% fewer graduates entering investment banking. This suggests that volatility presents a barrier to entering investment banking, rather than opportunities. A one standard deviation increase in volume (0.16) leads to 1.5% fewer new bankers. Each of these is statistically significant at the 1% level.[14]

Panel C shows a strong correlation between the fraction of graduating MBAs from Stanford and Wharton that go to Wall Street. As one might expect, when

[14] I also run specifications similar to those in Panel B and include the return variable from Panel A and values of IPOs, mutual fund assets, and new mutual fund sales in the calendar year before graduation. Each of these is positively and significantly related to entering investment banking upon graduation, but they all became small and insignificant when including the variables in Panel B. To maximize the available degrees of freedom, I drop them from the analysis here and below.

there is more Wall Street demand for Stanford MBAs and/or Stanford MBAs are more interested in Wall Street, the same holds for Wharton MBAs. On the other hand, Wharton and Stanford MBAs are competing for the same positions, which might dampen the relationship between IB placement at the two institutions.

Interpreting the effects in Table II as causal would be problematic if there are predictable cycles in Wall Street hiring and stock market activity. In this case, one might worry that a cohort's interest is correlated with market conditions rather than their first position being driven by it. Unlike stock returns while the person is in school, an argument could be made that the M&A variable will be predictable to a potential student before entering Stanford and hence may affect his decision about whether to attend. I would expect, however, that this would dampen the relationship between this variable and post-MBA investment banking jobs. This is because, if a person who is interested in finance anticipates a good year is about to take place in investment banking, he might be inclined to delay his entrance into business school until a time when the opportunity cost would be lower. If this were the case, then those who graduate after good M&A years would be less interested in finance than those who graduate after slow M&A years. Similar arguments apply to volume and volatility.

To ensure timing of the market by students is not an issue; I control for pre-MBA investment bank experience throughout the analysis when looking at post-MBA job selection. Also, I analyze the relationship between going into investment banking upon MBA graduation and the S&P return in the 2 years prior to enrolling at Stanford. As Table II shows, S&P returns *while at Stanford* are an important predictor of starting one's post-MBA career on Wall Street. However, S&P returns *in the period before enrollment* always have a small and insignificant estimated relationship with the likelihood of being a post-MBA investment banker.

Having established that the fraction of new MBAs going to Wall Street fluctuates with market conditions, I now consider the possibility that there are important differences in the types of MBAs that go to Wall Street in good times and in bad times. That is, assuming bull markets raise all students' estimates of $u^f(w_f^0)$, the model in which investment bankers are born implies that the marginal student for whom $u^f(w_f^0)$ roughly equals $u^g(w_g^0)$ will be less of a natural fit for a Wall Street career. To investigate this idea, I match survey responses by members of the classes of 1984–1995 with the courses they took as students at Stanford GSB. Given that the available data only include 12 years, the macroeconomic variation is not as great as one might hope and I do not present formal analyses. However, it appears that students who went to school during strong stock markets took more finance classes and that this is especially true among those who went on to be investment bankers. Finance enrollments dropped dramatically after the stock market crash in the fall of 1987. While the data do not allow a great deal of statistical precision, it is clearly *not* the case that those who went to Wall Street during the bull markets of the mid-1980s and early 1990s were less prepared for finance careers than those that went to Wall Street in the bear markets of 1988–1989 and 1993–1994.

In summary, stock returns while Stanford MBAs are in school have a statistically and economically significant effect on the likelihood that they work in investment banking immediately after graduating. That is, exogenous shocks affect the initial career choices of this sample. In the rest of the paper, I examine how long these shocks go on affecting the graduates and whether they have any effects on the graduates' incomes.

IV. Initial Conditions and Long-Term Outcomes

A. Persistence in Investment Banking

Figure 2 provides an initial look at how the first job after MBA graduation is related to jobs held later. The graph shows the fraction of each graduating class that initially takes a job in investment banking and then what fraction of the class works in banking for up to 10 years after graduation. As the graph shows, classes in which a relatively large set of people go into banking still have a high fraction in banking at any given year over this first post-graduation decade. For example, among those classes in which there was a substantial drop in people entering investment banking in the late 1980s after the crash of 1987, representation on Wall Street remained low over the entire available sample. While this suggests that an exogenous shock has long-term effects on human capital investments and careers, I now consider this issue more formally.

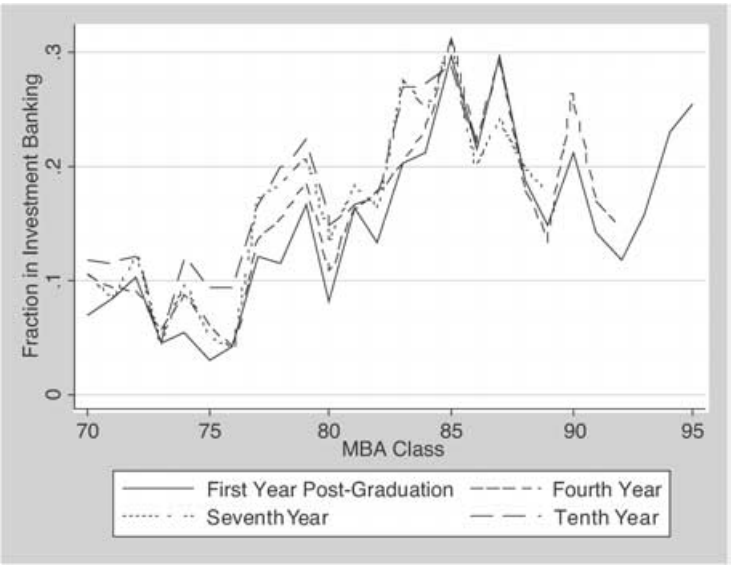

Figure 2. Fraction of class in investment banking 1–10 years after MBA. The lines show the fraction of the Stanford MBA class that graduated in the year on the *x*-axis that works in investment banking in the first January after graduation, the fourth January, the seventh January, and the tenth January.

I model MBA i's industry as of year t by updating equation (1) to

$$F_{it} = \alpha\theta_t + \beta X_{it} + \delta F_i^0 + \varepsilon_{it}, \tag{2}$$

where F_i^0 is an indicator for whether the person worked in investment banking in the first year after graduation. OLS will not reveal the *causal* effect of F_i^0 on F_{it} because an individual with an appropriate set of skills and/or tastes for a given industry will be more likely to both start in and eventually work in that industry. That is, both F_i^0 and F_{it} will be correlated with unobserved taste and ability captured by ε, so that I would expect OLS estimates of δ to be biased upwards.

However, to establish the basic relationship between initial and long-term investment bank employment that is predicted by the models discussed in Section I, I start by studying the relationships between long-term investment banking attachment, initial investment bank placement, and stock returns while in school. This provides a useful benchmark to compare with the IV estimates below and allows me to see how the basic relationship between initial and later employment (F_i^0 and F_{it}) varies with the state of the market at graduation (θ_t). I run OLS regressions where an observation is a person-year at least two and a half years after the person graduates from Stanford. The dependent variable is one if the person is an investment banker at the time of the observation and zero otherwise. Results are in Table III.

Table III
Industry of Longer-Term Job

All columns are results of linear probability regressions. The dependent variable, which is based on a person's job as of the end of January in a year at least two and a half years after graduation from Stanford GSB, equals one if the person works in investment banking (including money management or venture capital). "Initially I-Bank" equals one if the person was working in investment banking in the January after graduation. "S&P while in school" is the 2-year S&P return used in Panel A of Table II. "I-Bank Pre-MBA" equals one if the person worked in investment banking before studying at Stanford GSB. "Bull" ("bear") market includes graduating classes for which the 2-year average annual return of the S&P 500 was greater (less) than the median. Each regression includes indicator variables for gender, Black, Hispanic, Asian, year of observation, and years since graduation. The regression in column 4 includes the direct effect of "S&P while in school." Standard errors (in parentheses) are adjusted for any correlation within a graduating class.

	(1)	(2)	(3)	(4)
Initially I-Bank	0.7280	0.7352	0.7201	0.7264
	(0.0205)	(0.0285)	(0.0299)	(0.0257)
Initially I-Bank ∗ S&P while in school				0.0181
				(0.0756)
I-Bank Pre-MBA	0.0927	0.10847	0.0769	0.0926
	(0.0266)	(0.0234)	(0.0487)	(0.0268)
State of market at graduation	All Years	Bull	Bear	All Years
N (observations)	50,721	21,531	29,190	50,721
N (people)	3,362	1,794	1,568	3,362

As expected, there is a strong relationship between F_i^0 and F_{it}. The probability that a person who starts in investment banking will work there in a later year is about 73 percentage points higher than someone who starts elsewhere. Controlling for starting in investment banking after business school, the relationship between working in investment banking before business school and working there later is small.

I repeat the analysis, dividing the sample into groups that were in school when returns were above (bull markets) and below (bear markets) the sample median (bull markets). The 2-year S&P return varies from –27% (class of 1970) to 10.6% for bear market classes and from 14% to 64% (class of 1986) for bull market classes. The most noteworthy result in Table III is the consistency of the relationship between starting in investment banking and working there later. Columns 2 and 3 show that the 73 percentage point difference holds in bull and bear markets. Column 4 includes an interaction between initially working in banking and stock returns while the person is in school. The coefficient is quite small and insignificant. Combined with the suggestive evidence on finance class enrollments in the last section, this indicates that there is no evidence that bull markets attract less qualified or less interested candidates and runs counter to the model that predicts investment bankers are born.

I now estimate the causal effect of starting in investment banking (F_i^0) on working there later (F_{it}) by using instruments for F_i^0. The return on the S&P 500 has the ideal features of a valid instrument. It affects initial placement of MBAs, as shown in Table II, but I see no reason it would affect where MBAs work later except through the effect on initial placement. I would expect the M&A, volatility, and volume variables to be similarly valid instruments, though a better case can be made that these variables can be predicted ahead of time. As noted above, to the extent that M&A activity can be predicted, I would expect it to be negatively related to unobserved finance taste and to dampen IV estimates of δ when estimating equation (2).

I also use the fraction of MBAs graduating from University of Pennsylvania's Wharton School that went into investment banking as an instrument, in the hopes that it captures supply and demand features of the MBA/investment bank match in a given year that are not captured by the stock market variables. Unless Wharton and Stanford changed their admissions and recruiting policies in a similar way or the types of people that applied to top MBA programs changed systematically (neither of which is impossible), initial Wharton placement should be correlated with initial Stanford placement but not longer-term Stanford career choice. Because the Wharton information is only available as of the class of 1973, the sample size is reduced when using this instrument.

Two-stage least squares (that is, linear probability with instrumental variables) estimates of equation (2) with instruments for F_i^0 are displayed in Table IV.[15] The instruments in the panels of Table IV correspond to the

[15] The linear probability specification is relatively simple to implement and keeps the interpretation straightforward. Angrist (2001) argues that linear probability is an appropriate empirical approach in contexts such as this.

Table IV
Industry of Longer-Term Job

All results are based on two-stage least squares linear probability regressions. The dependent variable, which is based on a person's job as of the end of January in a year at least two and a half years after graduation from Stanford GSB, equals one if the person works in investment banking (including money management or venture capital). "Initially I-Bank" equals one if the person was working in investment banking in the January after graduation. The "Non-IB" ("IB") Pre-MBA sample is limited to people who did not (did) work in investment banking before studying at Stanford GSB. The "Finance" Pre-MBA sample is limited to people who worked in investment banking, accounting, commercial banking, insurance, real estate finance, or other financial services before studying at Stanford GSB. The "S&P" instrument for "Initially I-Bank," which is measured as of the time of MBA graduation, is the 2-year S&P return. "Other Market Instruments" include the M&A, Volatility, and Volume measures in Table II. The "Wharton" instrument is the fraction of new Wharton graduates who took investment banking jobs in the year the Stanford MBA graduated. The Wharton and M&A instruments are not available for all classes, so the sample size is smaller. Standard errors (in parentheses) are adjusted for any correlation within a graduating class.

	All	Non-IB	Finance	IB
Panel A: S&P 500 as Instrument				
Initially I-Bank	0.2796	0.0864	0.5031	0.8662
	(0.2695)	(0.3735)	(0.2691)	(0.1671)
Sample (Pre-MBA)	All	Non-IB	Finance	IB
N (observations)	50,721	48,602	5,274	2,119
N (people)	3,362	3,090	555	272
Panel B: Other Market Instruments				
Initially I-Bank	0.7424	0.7645	0.7670	0.5986
	(0.1119)	(0.1126)	(0.1768)	(0.2801)
Sample (Pre-MBA)	All	Non-IB	Finance	IB
N (observations)	31,570	29,751	4,569	1,819
N (people)	2,704	2,443	531	261
Panel C: Wharton Instrument				
Initially I-Bank	0.6761	0.5859	0.6664	0.9741
	(0.1384)	(0.1753)	(0.1960)	(0.2296)
Sample (Pre-MBA)	All	Non-IB	Finance	IB
N (observations)	19,185	17,227	3,681	1,481
N (people)	2,148	1,902	490	246

explanatory variables in each panel of Table II. Panel A uses the 2-year S&P returns while the person is at Stanford as an instrument for first job after graduation. The point estimate in column 1, which includes all available person-years, indicates that a person who takes a job on Wall Street upon graduation has about a 28% higher probability of working on Wall Street in a later year than someone whose first job is elsewhere. Column 2 shows that the point estimate drops noticeably when focusing on those who did not work on Wall Street before going to Stanford. Neither of these results

is statistically different from zero nor from the higher and more precise estimates in the rest of the table. Columns 3 and 4 of Panel A show that the effect is more precisely estimated, and stronger, for those who worked in finance (column 3) or on Wall Street (column 4) before studying at Stanford than for the rest of the sample. For the pre-MBA finance sample, going to work on Wall Street right after graduating from Stanford increases the likelihood of working there in later years by 50%. This effect differs statistically from zero at the 93% confidence level. The effect is 88% for those who return to Wall Street right after going to Stanford and is statistically significant at any reasonable level. Overall, Panel A indicates that there is a strong causal effect of initial Wall Street employment on longer-term Wall Street employment among the subset of the class that had finance experience before getting an MBA.

Panel B uses the M&A, volatility, and volume variables as instruments. Assuming potential entrants to MBA programs cannot anticipate these variables (or, alternatively, that these measures do not affect their MBA attendance decision), this specification is preferred to Panel A because the first stage regression is more precisely estimated. Columns 1 and 2 show that, even in the broad and nonbanker samples, there is now a strong and significant causal effect of starting on Wall Street on working there later. An MBA that goes to Wall Street upon leaving Stanford has about a 75% higher probability of working there at any given year later in his career. The effect is similar for the pre-MBA finance group. In this specification, the estimated effect of initial job on later job is somewhat smaller and is statistically significant at the 95% confidence level. Panel C repeats the analysis adding the Wharton placement instrument for first jobs. These estimates are slightly smaller in columns 1–3 but lead to similar economic conclusions.[16]

Overall, Table IV provides strong evidence that getting a job in investment banking has a large causal effect of working in investment banking later among the subset of MBAs that has already shown an interest in a finance career. The effect for the rest of the class ranges anywhere from zero to the same as for the pre-MBA investment bankers, depending on one's confidence in using M&A activity, volatility, volume, and Wharton's placement to instrument for taking an initial Wall Street job.[17]

While Table IV makes it clear that initial placement in investment banking is sticky, the effects in the table are averaged over all career years for the sample. To see how this effect varies over time, I run a series of IV regressions

[16] All effects in Table IV average across all career years. I also run a series of IV regressions limiting the sample to person-years a specific number of years after graduation. The results were quite similar and, at least for Panels B and C, largely statistically significant for almost 20 years after graduation.

[17] I reran the analysis in Table IV separately for each subgroup of investment bankers (that is, those working at an investment bank, asset managers, and venture capitalists). The results are noisier, but the qualitative conclusions are unchanged for investment bankers and assets managers. The results are not generally strong or significant when looking only at venture capitalists, largely because the first-stage regression is much less powerful for this group alone.

similar to those in column 1, Panel B of Table IV with each regression limiting the sample to person-years a specific number of years after graduation. Given the nature of the sample, the sample size gets smaller as the number of years since graduation increases. Therefore, the estimates get less precise over time. However, the estimated effect of initially working in investment banking is positive and significant in each of these regressions for respondents 3 to 19 years after graduation.

The overall message from Tables II and IV is clear. Stock market conditions while Stanford MBAs are in school have an important effect on whether or not many of them go from Stanford to a job on Wall Street. If they do go to Wall Street, even for "random" reasons driven by stock market conditions, they are much more likely to work there at any given point later in their careers than if they do not go to Wall Street. While people move in and out of investment banking after they enter the labor force, where they start matters a great deal. It appears that this effect is stronger for those most likely to be interested in working on Wall Street (that is, those who worked there before going to Stanford).

B. Interpretation

The key empirical results so far can be summarized as follows. High stock returns while an MBA is in school have a sizeable effect on the likelihood that the MBA will go to Wall Street upon graduation. MBAs who start their career on Wall Street are more likely to work there later. This relationship does not vary with the state of the market at graduation, so those who go to Wall Street during bull markets are not less attached to Wall Street than those who go during bear markets. The relationship is causal, in that those who go to Wall Street right after graduation are more likely to work there later *because they started their careers on Wall Street*. The relationship is particularly strong (or at least particularly precisely estimated) for those who worked in the financial services industry before pursuing an MBA.

The combination of these results suggests that the pool of potential investment bankers in a typical Stanford MBA class is relatively homogeneous and that those who go to Wall Street make important finance-specific investments. That is, the patterns in the data most closely match the "investment bankers are made" model presented in Section I. The data are consistent with a labor market where a large number of Stanford MBAs could be successful investment bankers, Wall Street firms demand more people when the stock market is doing well, and the wage difference between investment banking and other jobs is a compensating differential that roughly offsets the unpleasant parts of being an investment banker. This would explain the findings that the relationship between initially working on Wall Street and working there later is not dependent on the state of the stock market when MBAs graduate and that MBAs who go to Wall Street during bull markets are no less interested or successful in finance-related MBA classes than those who go during bear markets. That is, I find no evidence that the lucrative offers during bull markets attract those

who are less able or less interested in investment banking to start their careers on Wall Street.

While these patterns in industry transitions are consistent with the investment banking premium being a compensating differential for the demands of the job, rather than a skill premium, it is worth considering potential sources of the differential and how compensation information may shed further light on this issue. Consider four types of Stanford GSB alumni—investment bankers, consultants, entrepreneurs (those who founded a noninvestment banking business at which they work), and other. The respective weekly salaries for people in each of these groups with 6 to 10 years of experience, as of the time of the survey, were \$15,814, \$8,365, \$6,126, and \$4,311. Clearly, the investment bankers earn a substantial premium, as I show in more detail in the next section. One reason for this premium is differences in work hours. Unfortunately, the Stanford survey did not ask people about their hours of work.[18] However, I can calibrate how great the differences in work hours would have to be to justify these pay differences for a given utility function. Consider an additively separable utility function that is common in the moral hazard literature, $u = w - ve^2$, where u is utility, w is weekly compensation, e is hours worked per week, and v is a cost of effort parameter. Now suppose that a Stanford graduate in the "other" category works 40 hours per week to earn her average pay of \$4,311. Then, for this particular utility function, she would be indifferent between the "other" job, an entrepreneurial endeavor where she works 48 hours per week, a consulting job where she works 56 hours per week, and an IB job requiring 77 hours of work per week.

Though inexact, these estimates seem at least plausible given consulting and investment banking are known for long hours. The estimates are quite sensitive to the assumptions used, however. For example, if the typical "other" job involves 50 h per week, the utility function above would only be indifferent between the IB and "other" jobs if the IB job required 96 h per week. While some investment bankers certainly work that hard for periods of time, it seems unlikely to be the sample average. Also, if the true utility function is $u = w - ve^{\frac{3}{2}}$, then, given the salaries above, the MBA would be indifferent between a 40 h per week "other" job and a 95 h per week IB position. While hours differences probably cannot fully explain the compensating differential, these back-of-the-envelope calculations suggest hours of work may be an important contributing factor. Combining these hours differences with the fact that many investment bankers travel a great deal, the additional risk of compensation being tied to the industry's success, and the fact that IB jobs are centered in areas with very high costs of living (suggesting that the nominal pay differences measured here may overstate the real pay differences), it seems

[18] I compare hours of work among people who work in the investment industry and hold advanced degrees to those in other industries using broad Census Bureau samples. Investment professionals generally work somewhat longer hours, but only on the order of 5 more per week. The broad samples are unlikely to be similar to the Stanford sample, however, which includes more people at particularly high-paying banks with long hours.

plausible that the IB pay premium is a compensating differential for the type of work.[19]

Given the causal relationship between initial Wall Street jobs and long-term Wall Street jobs, the patterns in the data also indicate that Stanford MBAs build up significant IB-specific human capital while in school and very quickly after leaving school. That is, people who go to school during bull markets invest in finance classes at Stanford and in valuable on-the-job training shortly after graduation. There is no evidence to suggest that investment bankers are *inherently* better at their job than others in the pool of potential bankers. Instead, they appear to develop these skills over time. The evidence is consistent with the premium wages of bankers being a compensating differential for the work rather than a premium for the skill of the bankers.

While it appears that investment bankers are made from a fairly deep pool of Stanford MBAs, the data are also consistent with many Stanford MBAs being outside this pool. Suppose there are two types of MBAs—those who have an interest in finance and those who do not. The finance-disposed group is largely indifferent (given the wage differential) between finance and other opportunities when starting their careers. Given sufficiently strong beliefs about Wall Street conditions, they will start their careers in finance and they will make finance-specific investments while at Stanford and shortly thereafter. This group of homogeneous MBAs includes those who worked in finance before getting MBAs and some unobservable subset of the rest of the class. This variant of the model that predicts investment bankers are made is consistent with all the findings above, including the fact that all results are somewhat stronger for those who worked in finance before getting MBAs.

V. Measuring the Financial Impact

A. *What Would They Do if Not Investment Banking?*

Stock market conditions at graduation lead to careers on Wall Street. But, in order to estimate the financial ramifications of this effect, I need to make assumptions about what these people would have done if they had not gone to work on Wall Street. I address this question by looking at the effect of initial placement in investment banking on the probability of working in other industries in the longer term. To do so, I change equation (2) to

$$T_{it} = \alpha\theta_t + \beta X_{it} + \delta F_i^0 + \varepsilon_{it}, \tag{3}$$

where T_{it} is an indicator for whether the person works in some other industry in year t and I use the same instruments as in the last section.

Table V displays results where T is an indicator for being an entrepreneur (that is, working at a firm that he founded) or working in the management consulting industry. I should note that the results here need to be interpreted with

[19] This analysis brings up the interesting question of why it might be efficient for investment bankers to work relatively long hours, but that is beyond the scope of the current analysis.

Table V
Industry of Longer-Term Job

All columns are results of two-stage least squares linear probability regressions. Observations are based on a person's job as of the end of January at least two and a half years after graduation from Stanford GSB. "Initially I-Bank" equals one if the person was working in investment banking (including money management or venture capital) in the January after graduation. "Founder" equals one if the person founded the company where he/she works at the time of the observation. "Consult" equals one if the person works for a management consulting firm. Instruments for "Initially I-Bank" are explained in Table II. Sample sizes are the same as in column 1 of Table IV for each instrument. Standard errors (in parentheses) are adjusted for any correlation within a graduating class.

Dependent Variable	Founder (1)	Founder (2)	Consultant (3)	Consultant (4)
Initially I-Bank	−0.0344	−0.3081	−0.4581	−0.4266
	(0.1113)	(0.1510)	(0.2634)	(0.1635)
Instruments	Market	Wharton	Market	Wharton

caution because these are the two outcome variables for which I find a relationship with initially being an investment banker; I find no such relationship for working in high technology or working for a large manufacturing firm. One interpretation of this is that the "additional" investment bankers were more likely to become entrepreneurs or consultants than to work in these other areas. But another possibility is that, by looking at a bunch of possible outcomes, some are likely to appear to have a significant relationship with initial investment banking placement. While I therefore prefer to cautiously interpret the evidence here as only suggestive, choosing between these interpretations will be important when analyzing the effects of initial job on income in the next section.

Columns 1 and 2 show that there is mixed evidence that initial jobs on Wall Street lead Stanford MBAs to start fewer businesses. The coefficient is essentially zero when using the stock market instruments (and, in an unreported regression, when using stock returns), but negative and significant when using the Wharton instrument. If the Wharton variable is a valid instrument, it suggests that starting in investment banking lowers the probability of being an entrepreneur by about 30%. The consulting estimates (columns 3 and 4) are somewhat more consistent across the two specifications and the estimate using the Wharton instrument is again negative and significant. Overall, Table V provides suggestive evidence that the Wall Street careers generated by stock returns while students attend Stanford come at the expense of careers as consultants and as entrepreneurs.

B. How Much Wealth Is Transferred by Initial Conditions?

I now turn to the question of how much money is involved in the random movement of MBAs in and out of investment banking careers. As mentioned above, the data are not perfect for this purpose. Because people only report beginning

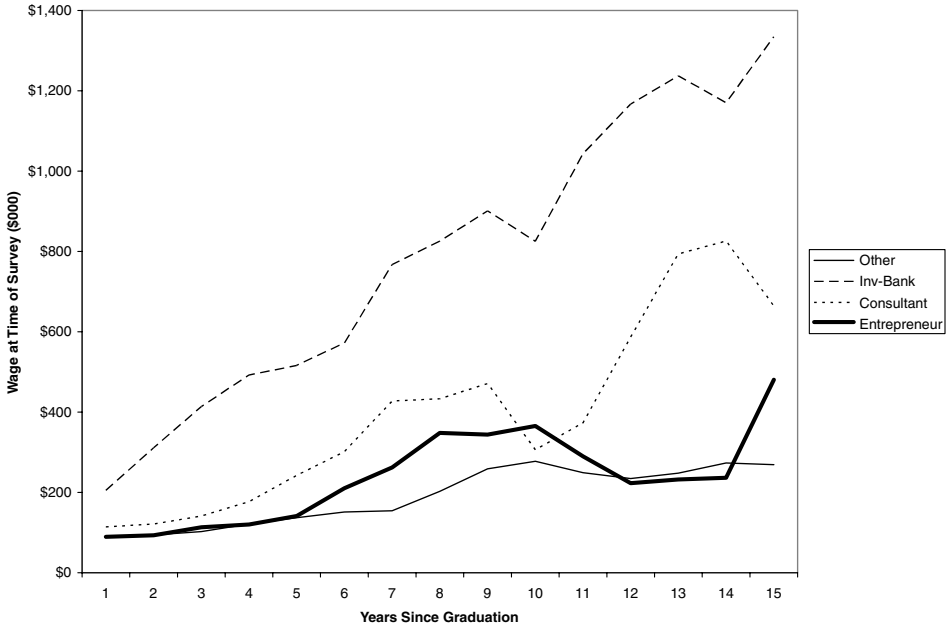

Figure 3. Career wage profiles by type of jobs. The lines show the average wage reported by respondents at the time of the survey (1996 or 1998) for each of four types of job by number of years since graduation. Entrepreneurs are people employed at companies they founded. "Other" includes all nonentrepreneurs employed in an industry other than investment banking and management consulting.

and ending salary for each job, I cannot directly estimate the effects on an individual of starting on Wall Street by fitting wage regression equivalents of equation (2). However, because respondents provided income information as of the date of the survey, I can use this cross-section to estimate wage profiles in investment banking and other fields over the course of MBA careers. I then discount these profiles over various career lengths to estimate the lifetime labor income gained by those who become investment bankers.

I begin by breaking the sample into four sectors as above: investment bankers, consultants, entrepreneurs (those who founded a noninvestment banking business at which they work), and other. I also divide the sample into groups based on the number of years since graduation at the time of the survey. Combining these divisions, I create sector-by-years-since-graduation cells and calculate the average wage in each cell. Each sector's average wages for years 1 through 15 after graduation are displayed in Figure 3.[20] Two clear patterns emerge. First, investment bankers earn a substantial premium over the other groups

[20] The average wage in each cell is estimated imprecisely because of the small numbers of people in some categories. To smooth out some of this imprecision, the graph actually plots, for each cell, the average salary for that cell, the cell from the same sector with one more year since graduation, and the cell from the same sector with one fewer year since graduation. For the first year, I average the cell and the second year cell.

throughout the first 15 years after graduation. Second, management consultants earn a premium over others, but not as much as investment bankers.

The income difference that I want to calculate, however, is not the simple difference between an investment banker at a given point in his career and someone at a similar point in a career in another field. I want to estimate the effect of *starting* in investment banking. Therefore, I calculate the expected income in career year t for a person who starts his career in investment banking as

$$E(w_{F_0 t}) = \Pr(F_t \mid F_0) w_{Ft} + (1 - \Pr(F_t \mid F_0)) w_{Gt}, \tag{4}$$

where w_{Ft} and w_{Gt} are expected income in career year t in investment banking and an alternative job, respectively, and $\Pr(F_t \mid F_0)$ is the probability the person will be in investment banking in year t, conditional on starting in investment banking. $\Pr(F_t \mid F_0)$ for a given t is the yearly coefficient from estimating equation (2).

To summarize the underlying logic, I generate expected year-by-year income levels for MBAs who become management consultants, entrepreneurs, or any other noninvestment banker based on the cross-section of wages as of the time of the survey. I generate expected year-by-year income levels for MBAs that start as investment bankers by taking the weighted average of the investment banker income and income in the other jobs. The weights for this calculation are based on the estimated causal effect of still being an investment banker in year t if the person went into investment banking right after getting his MBA at Stanford.

Based on this process for estimating experience/wage profiles in each of the four types of sectors, Table VI presents estimates of the pay differences between investment banking and other jobs at various points in a person's career. It also shows the cumulative present value of the income difference between investment banking and other jobs over the first 10 and 20 years after graduation, assuming either a 5% or 10% discount rate on future income. While the wage difference between fields and over a career profile will surely change over time, these estimates are what a new graduate might expect in 1996 looking forward.

The first few rows of Table VI show the expected wage differences, in the 1st, 7th, and 15th year after graduation, between someone who starts as an investment banker and someone who works continuously in one of the other areas. These estimates vary from a 64% difference between investment bankers and consultants right after graduation to the investment banker expecting to earn three to six times what people in the other groups can expect. For example, members of the "other" category earn an average of $286K 15 years after graduation while someone who starts as an investment banker can expect to earn $1.2 million at that point. At this same point, investment bankers can expect to earn almost double the $645K earned by management consultants.

Discounting these figures over a 10- or 20-year career leads to a substantial absolute income premium for investment bankers. The smallest estimate of this premium is about 64% (for an investment banker who otherwise would have

Table VI
Income Differences between Investment Bankers and Others

All calculations are based on salary averages for sector and years since graduation from the cross-section of 2,598 survey respondents. Investment banker wage estimates are adjusted for the likelihood that they will still be investment bankers at each year after graduation. See text for details.

Alternative Job	(1) Other	(2) Consult	(3) Entrepreneur
Wage difference estimates:			
Year 1 Wage Diff. ($000)	$97.5	$71.2	$114.9
Year 1 Wage Diff. (%)	115.4%	64.3%	170.1%
Year 7 Wage Diff. ($000)	$504.0	$308.1	$321.6
Year 7 Wage Diff. (%)	331.6%	88.6%	96.2%
Year 15 Wage Diff. ($000)	$937.2	$578.4	$1,014.5
Year 15 Wage Diff. (%)	327.4%	89.7%	485.6%
Lifetime income difference estimates (discount rate = 5%):			
10 Year difference ($000)	$2,678	$1,758	$2,356
10 Year difference (%)	216.2%	81.5%	151.1%
20 Year difference ($000)	$5,505	$3,117	$4,804
20 Year difference (%)	216.2%	63.8%	150.2%
Lifetime income difference estimates (discount rate = 10%):			
10 Year difference ($000)	$2,151	$1,447	$1,918
10 Year difference (%)	220.3%	86.1%	158.5%
20 Year difference ($000)	$3,642	$2,153	$3,219
20 Year difference (%)	223.4%	69.1%	156.8%

been a consultant and considers a 20-year horizon).[21] The difference between investment bankers and others is at least 150% and can reach several million dollars in present value. These estimates suggest that substantial amounts of wealth, both in absolute dollars and as a percentage of lifetime earnings, can be moved from or to a given MBA by uncontrollable macroeconomic factors while he attends business school.

As a final calculation, I consider how much total discounted lifetime income one whole class of MBAs can expect to earn relative to another based solely on stock return differences while they attend school. A one standard deviation change in the 2-year return of the S&P 500 is associated with 2% more of the class entering investment banking. A typical Stanford class has 350 students, so 2% is seven extra students going to Wall Street. Given the estimates in Table VI, this suggests stock returns during school lead one class to have between $11 million and $35 million more discounted lifetime earnings than the other class in the first 20 years after graduation. Consider the more stark example of the

[21] The estimated difference between being an investment banker and being a consultant is likely to be conservative. It compares the pay of a person who stays in consulting his whole career to one who goes into investment banking and, with some probability, ends up in the "other" category. In effect, I compare a career consultant to one who gives up an opportunity to go into consulting in order to go to Wall Street and can therefore never enter consulting.

classes of 1986 and 1987 (which graduated before the crash of 1987) compared to the classes of 1988 and 1989. Year fixed effect regressions similar to the ones displayed in Table II suggest the pre-crash group had a 7.3% higher probability of working on Wall Street immediately after graduation. This means that about 50 more members of the two pre-crash classes started on Wall Street than the post-crash classes, which means these classes earned an extra $75 million to $250 million over the first 20 years after graduation.

One concern that naturally arises from this back-of-the-envelope approach to estimating lifetime effects is whether the underlying assumptions and numbers are valid. The fact that the income measure is "salary" rather than total wealth created in a year is of particular concern. However, if anything, I would expect this to mean that the income premium for investment bankers in Table VI is biased downward because so much investment banking income comes through bonuses. The one exception to this might be the comparison with entrepreneurs who often earn substantial wealth through building equity that they would not report as salary. Another potential problem is that the income measure is categorical rather than exact. However, this concern is largely alleviated by the fact that the averages I calculate are consistent with the information provided by the career office based on its exit surveys.

To get some idea of the sensitivity of the results to the underlying assumptions, I generate two alternative sets of estimates to compare to those in Table VI. First, I rerun the analysis focusing on the median reported salary for each occupation-by-years-since-graduation group. This leads to somewhat smaller estimates of expected income differences for investment bankers. For example, instead of the premium relative to consultants varying from 63 to 86% and $1.4 million to $3.1 million, the median-based estimates are 42–60% and $566K to $1.8 million. The premium relative to "other" drops to 162–199% (from about 210% in Table VI) and $1.3–2.1 million (from up to $5.5 million.) Second, I consider the possibility that there might be some small elite group of Stanford MBAs that would be top investment bankers no matter the market conditions and that the rest of the investment bankers are the marginal group that are made by conditions at graduation. Suppose the elite group comprises 30% of bankers. Given that approximately 18% of graduates go into investment banking, I assume that the top 5.4% (30% of 18%) of each graduating class, in terms of investment bankers compensation, is not affected by stock market conditions and eliminate them from the sample. I then regenerated the estimates in Table VI comparing the remaining investment bankers to the people in other occupations. This effectively eliminates the differences between consultants and investment bankers. Also, the premium relative to "other" drops to between $666K and $1.7 million (about 70%). This is still a substantial premium, but noticeably less than before. While the basic assumptions underlying this reduced set of estimates is not consistent with the results in Table III, it is worth noting that to the extent that I underestimate the importance of heterogeneity in the earlier analysis, that would lead to a substantial reduction in the wealth effects of taking an initial position in investment banking.

While the estimates in this section are no doubt imprecise, they provide substantial evidence that Wall Street conditions at graduation affect many MBAs' jobs and income for a long time after graduation. In combination with the earlier results, they suggest that the compensating differential to induce an MBA to become an investment banker is quite large.

VI. Conclusions

Stock price movements can create and destroy a lot of wealth among investors. In this paper, I have shown that they can also create or destroy a lot of future labor market income for people earning MBAs. Bull markets encourage new graduates to start their career on Wall Street, which has a strong *causal* effect on the likelihood of working there later in an MBAs career. Because investment bankers earn a substantial premium relative to nonbanking MBA professionals, any effect on initial job placement has a substantial and long-term effect on many MBAs' income. The results are consistent with a model in which the large premium for working on Wall Street is a compensating differential that makes many new MBAs nearly indifferent between jobs on Wall Street and elsewhere, and with bull markets leading MBA students and recent graduates to develop significant finance-specific human capital. Further research is required to be more precise about what causes this career stickiness and better data would help more accurately measure the effect on career labor income.

The results also suggest that risk-averse MBA students, especially those interested in Wall Street careers, may want to take actions to insure themselves against the random wealth effects imposed by stock returns while they study. These students should short the stock market upon entering school so that their portfolios hedge their expected labor income.

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