

The Changing Nature of the Initial Public Offering Market

Timothy Loughran

Arnold Wood: Tim Loughran is a fellow who's presented to this group in the past, and I've always appreciated what he's had to say because it gets a little more to the practitioner's side. As you can see, we're beginning to mix up the group from the theoretical to the practitioner's side. Tim.

Timothy Loughran: Thank you so much. This paper is joint work with Jay Ritter at the University of Florida. The title of the presentation is "The Changing Nature of the Initial Public Offering Market." Let's first examine the key summary statistics. We are interested in examining if there has been an increase in average first-day returns on IPOs over the time period 1980 to 2000. Up front, I want to define what I mean by first-day returns. First-day returns are defined as the percentage change measured from the offer price to the closing market price on the issue date. So we are measuring from offer to close. Our presentation will address why first-day returns have increased over time.

Let's look at the 1980s. The 1980s have much lower first-day returns than the 1990s. And the 1990s are much different than the Internet bubble. What is going on? What explains the severe underpricing of IPOs during this bubble of 1999 to 2000 where first-day returns are on the order of magnitude higher than anything seen before in the IPO market?

There are a couple possible explanations. One is higher valuations. Issues with recent increases in wealth are more complacent in bargaining for a higher offer price. And the underwriters, investment banks, take advantage of this complacency. I'll give you three measures of what I'm going to look at. Earnings: are the earnings different across the decades? Are the firm ages at the time of the offering different? Are these just young companies that all of a sudden are going public? Are sales different over time for these IPOs?

Another way of thinking about this point is: are firms going public at an earlier stage in their life cycle? Maybe what has been accounted for is this increase in first-day returns over time. Second of

all, has a shift in IPO quality taken place by prestigious underwriters who have reputational capital at stake? Later in the discussion, I will look at the long-run performance of IPOs. Does the long-run performance of these IPOs vary on the basis of quality characteristics known at the time of the offering?

Moving to the data section, we looked at 4,890 IPOs from SDC in the time period of January 1, 1980 to the end of December of 2000. We want to screen out a lot of these small IPOs from the sample. Some people say these small IPOs are driving performance returns. This screen removes 1,198 IPOs from the final sample. The IPOs must have an offer price of at least \$8 to get invited into the dance.

We also remove unit offerings, closed-end funds, ADRs, and banks. Financial institutions are highly regulated in their first-day returns. We are getting the first closing price and post issue number of shares from University of Chicago Center for Research in Security Prices (CRSP). This first plot is the first item that David Dreman presented yesterday. It shows average first day returns within each of these calendar years, 1980 to 2000. Recall that when I say first-day returns, I'm talking about the change measured from the offer price to the closing market price on the issue day.

Let's look at it. We have two items: the number of IPOs and the volume of IPOs as they vary over time. After the crash in 1987 there was a bit of a slow-down in the IPO volume. After the Gulf War in '91, the IPO volume picked up. Notice in 1983, we had a big increase in the volume of IPOs. Now we also have average first-day returns. First-day returns in 1984 were almost zero. Yet, in 1984 over a hundred IPOs went public. In 1999 and 2000, there were over 60 percent average first-day returns. What is going on here? That's what Jay and I are trying to figure out.

I'm going to do some definitions. Market cap is defined as the first CRSP-listed price times the first number of CRSP-listed number of shares outstanding. Now we need this prestige variable. I'm going to follow the procedure used in the paper by Carter-Manaster (*Journal of Finance*, 1990). Their paper sorts underwriters into low and high prestige categories. And so if it's a rating of 8 or more that places the underwriter into this high

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prestige category. The prestige scale ranges from 9 to 0. What kind of firms is in there? Goldman Sachs, Morgan Stanley, Salomon. These are all high quality underwriters. And from SDC we also have whether or not the IPO has Venture Capital (VC) backing at the time. We know who the underwriter is and we know whether they have VC backing or not at the time of the offering.

Also from SDC, we report the proportion of IPOs priced below, within and above the initial file price range. An interesting finance pattern was first documented by Hanley way back in 1993 (*Journal of Financial Economics*). She documented that the first-day returns are related to the revision in the offer price. That is, IPOs where the offer price is revised upward, above the initial file price range, see much higher returns on average than those whose offer price was revised downward.

To give you an example of this file price range, in August 1995, Netscape had an initial file price range of 12 to 14. Then the investment banker went out there and solicited information like, "What do you think about Netscape?" and "How much do you want to buy?" Investors wanted the stock. What did the underwriter Morgan Stanley do? They bumped it up, but not all the way. They bumped it up to 28. The offer price was set at 28. That is a bullish sign because the underwriters have gotten all these interested investors. Investors want to buy this at this price. This is almost sure thing. Netscape closed on the first day at 58, a hundred percent increase from the offer price.

Age is defined as the calendar year of the offering minus the calendar year of the founding. The founding date is generally defined as the date of incorporation. We tried to insure that the date we were using was the original incorporation rather than some later date that they reincorporated in Delaware or changed their name. We have all these different sources that we're getting this founding data from, including Laura Field, Renaissance Capital, SDC, and the prospectus. I would like to give you an example of how this is not as easy as it may sound.

A company called Krispy Kreme recently moved over to the NYSE in April 2000. In the Krispy Kreme April 2000 prospectus it states that the firm going public was incorporated in 1999. So that would make it a one-year-old company. But wait a minute, wait a minute. In the prospectus it says the predecessor corporation was founded way back in 1982. Oh, this is an 18-year old company. Wait a minute, wait a minute. If you keep reading, it says they opened their first doughnut shop in 1937. This is a 63-year old company. Krispy Kreme is old. It is 63 years old. Sixty-three is the age we used.

Let's look at the 1980s, the 1990s, and the Internet bubble. When I say the 1990s, I mean 1990 to 1998. I want to look at the 1980s, the 1990s, and the bubble because they're very distinctive. Look at the 1980s average first-day returns, which are 7 percent. Then the 1990s, which are 15 percent. Wow, more than doubling. There is a very, very significant difference from 7 to 15. And then look at the bubble. The average first-day returns are 69. Isn't that amazing? What is going on in this market?

I talked about the file price range earlier in our discussion. Let's look at the impact of the revision on first-day returns. The revision in offer price relative to the initial file price range changes over time. The underwriters set this initial file price range number. Usually it is a \$2 difference between high and low range. The investment banker goes out, talks to potential investors and revises the offer price. It is revised down about a quarter of the time, above about a quarter and within its initial price range about 50 percent. So they can move the offer price down or they can increase it up or the offer price can be left unchanged compared to the initial file price range. You see a little bit of a bump up in the bubble period as about half are increased from the initial file price range.

Okay, let's look at the first-day returns which are 3 percent. The first-day returns in the case where the file price has been moved down are not so good. In the 1980s, the average first-day returns were zero. In the 1990s, it was 4 percent. Finally in the Internet bubble, it was 7 percent. Okay, so we've seen an increase over time. Let's look within the file price range where it is 6, 11, 27 and 11 percent and then above the 1980s. Wow, 18 percent. Once again, this is a very good sign in the 1980s. In the 1990s, it even got better at 32 percent. And look what happened in the bubble. It's not a typo. It's really 121 percent.

Now, here's a little graphic description of my summary. In the 1980s, you have a slight relationship between first-day return and whether or not it was below or above or within the file price range. Once again, it is a really good sign if the offer price is above the initial file price range. The 1990s are a little stronger and then in 2000 even the ones that were downgraded went up substantially on the first day of trading. What has changed here?

Now, 121 percent is not a bad one-day return, is it? Let's annualize that. Next, we have first-day returns by firm quality. So now we're going to look at firm size. How does size vary over our decades? Look at underwriter prestige. How has that changed? Sorting by VC-backed capital, segmented by earnings, our earnings sort is simply positive

or negative. So in the 1980s, small firms had about 6 percent first-day return, in 1986 it was 10 percent, in the 1990s it was 11 and 23 percent and then in the bubble it was 13 percent. Wow, large firms had 83 percent first-day returns.

Let's look at it by underwriter prestige. I think this is a real shift. The title of the presentation is "The Changing Nature Of Initial Public Offering Market," and this is something that has changed in the 1980s, consistent with papers like Carter, Dark, and Singh (*Journal of Finance*, 1998). Low prestige underwriters actually had higher returns than higher prestige quality.

When I say high prestige, think Goldman Sachs, Morgan Stanley and Salomon Brothers. In the 1990s, it was a little bit of a flip. Now first-day returns are larger for high prestige underwriters, 75 percent one-day return. So these IPOs underwritten by high prestige bankers were, on average, 5 percent first-day returns in the 1980s. All of a sudden we're in the bubble and it's 75 percent.

Let's examine the impact of VC backing. Non-VC backed IPOs had first-day returns of 6 percent in the 1980s, 9 percent in the 1980s and then it goes to 18 percent. Wow. Once again, a big shift has occurred. Non-VC-backed are still huge, 42 percent, but VC-backed IPOs had 86 percent average first-day return in the bubble. Let's keep going on.

We next segmented IPOs by earnings positive and negative. We are using actual trailing numbers, not the forecasted EPS numbers. There was not much of a difference in the 1980s or in the 1990s and a bit of a bump up in the bubble. For negative earnings, we had a 78 percent first-day return during the bubble.

Voice: Just a quick question. These are mean returns, right?

Timothy Loughran: Yes.

Voice: Are negative earnings explained by the fact that there were some technology companies that were really flying?

Timothy Loughran: If you look at the positive earnings firms, I'm going to show you an interesting time series result. I look at the time series of earnings and I'm amazed at how positive it was in the 1980s. And then I'm going to look at age characteristics and see how that varies across time. Okay, now we want to examine trailing EPS numbers. We go from 1980 to the year 2000. In the 1980s, almost 85 percent of all firms going public had positive earnings. Remember, we did an \$8 offer price screen. These are more established firms. Time goes on. Look what happened in the bubble. Wow! In the year 2000, less than 20 percent of firms going public had positive earnings. So we went from about 85 percent in the 1980s to 17 per-

cent in year 2000. That is a big shift. We'll see that it doesn't explain everything though. That's what you think is kind of fascinating about this.

Arnold Wood: But during a bubble if you lose money, it's an investment.

Timothy Loughran: Be careful. These are earnings for the company so these are the characteristics of the companies going public.

Arnold Wood: What I'm saying is that the brokers were trying to sell a company losing money as though the company's losses were investments. It's a new paradigm. If they lose money, they're making investments.

Voice: That was Amazon.com.

Arnold Wood: Absolutely.

Voice: But going back to the question that was just asked, can you separate technology versus non-technology?

Timothy Loughran: That's basically the VC dummy variable. It's almost exactly the same numbers. So for example, what do you think non-tech did? We used various different SIC codes to gauge technology, including telecommunication hardware. We did a broad non-tech and in the bubble first-day returns for non-tech it is about 40 percent. So tech is part of it, without a doubt, but non-tech is there too.

Voice: What was the appreciation?

Timothy Loughran: Tech is always more than non-tech, but it's unclear if I have adjusted for some of these others. It's not as strong as you may think. In a graph on firm age at the time of the offering, it shows the median age is the same. There's no shift in age that has occurred during the time period. The median age in the 1980s is 7 years. Apple Computer was young when it went public. The median age in the 1990s was 7 years. Cisco Systems was young. The median age in the bubble was 7 years. There's no shift in the age of the firm's going public. The median is almost always the same.

What's problematic about market cap is that it deals with valuation. When you look at a graph showing sales and all the decades, you see a shift. IPOs with less than \$20 million in sales report 70 percent first-day returns. It is even more for the firms that were just a little bit more established, 20 to 50. And it goes on and on. So Jay and I are always trying to make sure that we're not goofing up here. Isn't that amazing? These are companies that went public in the bubble with over \$200 million in sales and yet the first-day returns were over 20 percent. This cell right here is bigger than any of the other cells on the other decades and who's in there? We found that Krispy Kreme is in there with 76 percent first-day return. This is a company that had \$220 million in sales and was 63 years

old. UPS is in that group. UPS was 92 years old when it went public and it had first-day returns of 35 percent. What is going on? Goldman Sachs is a 98-year old company with a billion in sales and first-day returns of 33 percent? It's not just tech. It's everybody. So now you're all excited here.

Arnold Wood: Do the underwriters make more money if it goes to a higher price?

Timothy Loughran: Yes.

Arnold Wood: So they're all blowing it basically. All these things could have gone at a much higher price?

Timothy Loughran: Yes.

Voice: Most people, like myself, were not able to sell short until the fourth day of trading, so much of the profit was probably going to those who could sell or sell short, such as the underwriters and institutions.

Timothy Loughran: And whoever is getting the shares. I mean 121 percent during the bubble. If the offer price was above the initial file price range, that is a fine one-day return. Even companies with \$200 millions in sales, that are old, achieved over 20 percent returns on one day.

Arnold Wood: So Goldman Sachs isn't annoyed that they went 33 percent higher?

Timothy Loughran: They love it. It's also easier to sell. You want to buy something for 28 that's going to be traded for 58. Yeah, I think I will. How much do you want? As much as you will give me.

Voice: That works from the portfolio manager's viewpoint also because he might buy something that he doesn't really want, but if he doesn't buy it he might not be offered the next go-around.

David Dreman: But also anybody who has tacit agreements like if you do so much business with any major underwriter you're going to get the stock.

Timothy Loughran: What I think is most fascinating about what I've shown you is the person who should be really upset is the firm. I mean they should be livid, and yet it went on for a while.

Voice: Who in the firm?

Timothy Loughran: Well, first of all, even the CEO should be looking out for the shareholders. And a lot of these Internet companies would love to have had some of the money back that they left on the table.

Voice: True, but it's not exactly sure that the CEO wasn't better off in this respect. The CEO is mostly concerned about what the price is at end of the lockup period.

Timothy Loughran: Which is six months typically.

Voice: It's not entirely clear that it might leave you with a better shot with a better price six months down the line than a struggling IPO at a higher value. I'm not saying it's right. I'm just saying it's

not clear from an agency point of view that some of the insiders weren't worse off.

Timothy Loughran: So now we have this regression. On the left-hand side, the dependent variable is first-day returns. We're trying to explain first-day returns by each of the decades. Then we have the VC dummy variable of 1 or zero with one if it's a VC backed. The second independent variable is the offer price upgrade dummy. Once again, it is 1 if it's an upgrade. Then we have the natural log of age plus 1 variable. We added one to each IPOs age because we have some firms with zero age. And we see, just as you would expect, VC does add something. The offer price upgrade is very, very strong which is a very bullish signal. First-day returns, if they have been upgraded from the initial file price age, are negative. The older you are, the smaller your first day gains are. Then prestige is strongly positive overall across decades.

What I think is fascinating is what happens to prestige over time. So we have the 1980s and it is the same pattern, except for prestige. In the 1980s, if you had a top tier banker, all else being equal, you had lower first-day returns which is consistent with some of the prior finance literature, such as Carter Dark Singh (*Journal of Finance*, 1998). And then in the 1990s the pattern was the same. Now prestige is not significant. The t-statistic is at 1.06. And then we have the bubble period. What I think is amazing is the difference in magnitude of the coefficients across time. Upgrades are still strong. Age is strongly negative. Size is strong.

Voice: Have you put in the percentage of the shares that are issued in the IPO?

Timothy Loughran: Like 15 percent?

Voice: Yes, as another independent variable.

Timothy Loughran: That's something we can do.

Voice: So you might be better off. It's like a lost leader. You may have sold a little bit of the company cheap so as to end with a very high end-of-the-day valuation for the 85 percent of the company that the insiders and everyone who owned the company at the beginning of the day still own.

Timothy Loughran: We still have to look at what you're pointing out. We want to look at the six-month period when the lockup period expires.

Voice: That's not the only thing. There would also be issues if you were trying to raise money in other ways having a huge capitalization.

Timothy Loughran: That's a good point. I see where you're coming from.

Voice: He's talking about float, right?

Arnold Wood: What you have shown us means if you're an un-prestigious underwriter, whatever that is, you would have done better?

Timothy Loughran: Yes, higher first-day returns as you saw in an earlier table.

Arnold Wood: That A.G. Edwards or Joseph Stevens down in Alabama or Arkansas you would have done better than Goldman?

Timothy Loughran: It depends on what better is. These are just higher first-day returns and you saw that when I did summary statistics in the 1980s, the numbers were 7 percent and 5 percent. This is kind of interesting. Getting to the Internet bubble, having prestigious underwriters, they're leaving a lot of money on the table. And let's talk about what's going on with the quality of the underwriters. Top-tier underwriters, the ones with the most reputation at stake, have really changed the quality of the firms they've taken public. I would describe it as a flight to youth. In a table where we are reporting median values, it shows that in the 1980s the median first-day return for prestigious underwriters is 1 percent. Not much, huh. 1 percent. The age is 9 years. The sales are \$84 million. And once again, in 2000 dollars, trailing 12-month earnings, we see 66 cents. In the 1990s, the age is 7 years and sales are almost identical at \$81 million. Earnings are a little bit lower at 3 cents on the median and the trailing 12 months EPS is 32 cents. Looking at the median, first-day returns for these top-tier underwriters in the bubble, it is 42 percent first-day returns. It is only five years, so they started off in the 1980s. Once again, it's 7 years across, so in the 1980s they took older companies public. For the bubble, it's two years younger. Look at the whopping sales number that the top-tier underwriters are taking public, \$15 million. So clearly, it is a flight to youth.

David Dreman: Also the sales with the VC's, the VC's would pump sales from other companies into the company going public.

Timothy Loughran: So what you're saying is these numbers may be a little inflated. Now we want to look at a multifactor regression. I'm looking at equally weighted monthly portfolio returns. We started in 1980. Our strategy is the following. Each month we look back and they say what IPO has gone public in the last five years. If they have gone public, they're part of our portfolio.

If I start in 1980, we don't have many firms. So we'll start in 1981 through December of 2000 or 240 months of data. Every month is counted the same, IPOs in this portfolio for up to five years after the offering. Consistent with the Brav-Gompers (*Journal of Finance*, 1997) paper, we found that there's a difference between VC or non-VC-backed IPOs on the basis of subsequent returns.

When we look at prestige we found that prestige was minus 30 basis points and non-prestige was minus 51 basis points per month. The difference is 21 basis points, which is not a statistically significant difference. This is inconsistent with

what Carter Dark and Singh. They said that there's a difference in subsequent returns between prestige underwriters and non-prestige. It would be interesting to see how this is going to change over time when those fine 1999–2000 cohort year IPOs bear fruit or subsequent returns.

So once again, it doesn't look like prestige deviates. With positive and negative earnings we see that positive earnings are minus 44 basis points and negative earnings are minus 46 basis points. The 2 basis point difference per month is not statistically significant.

I want to talk about the dark side of book building. If you read the literature, it's mostly positive with book building. In book building, underwriters have complete discretion to allocate shares. This is emphasized in two academic papers and they give benefits for issuing firms in using the book building procedure. So if you think about it, if the underwriters can reduce the average amount of underpricing through book building, therefore, increasing the expected proceeds by favoring regular investors, this is useful for pricing an IPO. Furthermore, the underwriters have complete discretion. They can allocate the shares to people, like pension funds or endowments that are going to be "buy and hold investors." They are thereby minimizing any cost associated with price stabilization, so this is the positive side of book building. There's another side though. This discretion can be a disadvantage if one does not control agency problems.

Think about stock options. Stock options in theory, in principle, can be good for minority shareholders, particularly since stock options align the interest of managers and equity holders. But it can be bad for shareholders if excessive dilution results. It is also an opportunity for self-dealing. Managers can influence the compensation committee of the board of directors they help pick. The previous literature focuses on the bright side of this discretion.

However, there is a negative side of book building. It is the self-dealing by these underwriters. Something I don't understand why these underwriters suddenly appear to use this discretion more completely in this bubble period than in previous periods. They've had this ability for a while and yet it took them until 1999–2000 to really pump it up.

Voice: How do you know they're doing that?

Timothy Loughran: It's just that they are doing a much better job in the sense of benefiting themselves through higher first-day returns.

Voice: Something, but it might not be that.

Voice: That's right, they may be just acting like they did in the 1980s but there may be more buyers or whatever the case may be.

Timothy Loughran: Yes, the big difference in the 1980s was a one percent median first-day return

for prestigious underwriters. In the bubble, the median returns became 42 percent. There's something going on here that seems to have changed. There has been a large increase in average first-day returns. Young firms are riskier than older firms. That's a true statement. Yet, when you look at the evidence, the typical age of the company has not changed if you look at the 1980s. If you look at the 1990s and you look at the bubble, the median age is 7. In all three time periods, there's a big shift upward across all age 4 categories. Across all ages, we saw an increase in first-day returns.

One last point, there is a big difference in realized IPO returns in the subsequent five years following on the basis of characteristics known at the time of offering. We know if it's VC-backed or not, we know the age of the company if it's old or young. These characteristics are known at the time of the offering. We're all done.

Arnold Wood: Any questions?

David Dreman: Just one question. The 1999–2000 period is when the age of the youngest—

Timothy Loughran: But the median is still 7.

David Dreman: In that period two?

Timothy Loughran: Yes, that's what's amazing is that the median is 7, in the bubble, in the 1990s and in the 1980s.

Voice: Did people realize that Krispy Kreme was old when its IPO was announced?

Timothy Loughran: Oh, yes.

Voice: Within NASDAQ, if you were to exclude from NASDAQ those IPOs, what would NASDAQ up and down look like?

Timothy Loughran: It would be even a little bit stronger. NASDAQ-listed IPOs would have higher first-day returns.

Voice: That's not my question. When you look at the bubble, can you say that the bubble is essentially the IPO bubble or was the bubble the NASDAQ?

Timothy Loughran: I don't really know.

Voice: The NASDAQ is heavily capital-weighted so Intel, Cisco, so a large part of it has to be the older established companies, but this contributes.

Timothy Loughran: I don't know.

Voice: In terms of what happens on the first day, if you look at the supply and demand picture, the average retail investor cannot sell for 30 days, sometimes longer in some firms, otherwise he'd be banned from the IPO program. So the institutional investors dump right away, but they're just a small fraction. The insiders cannot sell for six months. And so who is the selling done by? It's done by the underwriter so it's a highly rigged market as some of these papers show. In the first month of an IPO it's a highly rigged market. Even short selling is not possible until the fourth because they claim they don't have the registry.

Timothy Loughran: Even after that it's hard to short sell sometimes.

Voice: So what happens is you have this rigged market where the selling is limited and the only question is why are there so many investors that buy it at such a high price? And in previous years this may not have happened because as it is, the dilution effect is such that we, the shareholders, put up a hundred percent of the capital, but own 5 percent of the company. At the same time there aren't the short sellers and individuals who are selling, so you have the absence of sellers. I think that's what explains the IPO bubble of 1999 to 2000.

Timothy Loughran: But it went on much longer than I thought. David already alluded to this. These short sellers got blown out. They were gone.

David Dreman: I think also that the institutions get out of these stocks fast. I think within 90 days or 120 days they're almost a hundred percent owned by individuals, so the institutions blow them out. There are no restrictions on them. They blow them out within a day to a couple of weeks to a month or two.

Timothy Loughran: There is also the aspect, as you have alluded to, that is hard for you and I to call up and say I want shares of Netscape. Sorry, it's all been sold.

Arnold Wood: Tim, thank you.