

Why Are So Many New Stock Issues Underpriced?

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Each year hundreds of small firms approach the capital market to issue equity for the first time. These firms are usually growing so fast, or have so many profitable investment projects available to them, that traditional sources of funds (bank loans, retained earnings, and the owners' own equity) are often insufficient to finance their expansion.

Because of this need for finance at a crucial stage in their growth, it is important for these firms that the prices of their shares reflect the

true value of company assets or growth opportunities. In particular, if their shares are sold too cheaply, these firms will have raised less capital than was warranted by the intrinsic values of their assets. In other words, their shares will have been "underpriced."

Considerable evidence shows that new or initial public equity offerings (IPOs) are underpriced on *average*. That is, the prices of firms' shares offered to the public for the first time are, on average, set below the prices investors appear willing to pay when the stocks start trading in the secondary market. That is, in the parlance of investment bankers, small firms appear to leave behind considerable "money on the table" at the time of a new issue.

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Why small firms raise fewer funds in the new-issue process than the market indicates they should is a crucial public policy issue. Clearly, some degree of market imperfection or lack of competition could cause such an outcome. For example, if, by restricting commercial banks' participation in the market, the Glass-Steagall Act of 1933 has allowed investment bankers to enjoy a type of monopoly (market) power over new equity-issuing firms, then this would suffice to explain underpricing. Alternatively, underpricing may be the premium the issuing firm must pay for having little information about itself to offer potential investors. In that case, underpricing would have little to do with the regulatory structure of the investment banking industry.

Let's examine the reasons for IPO underpricing and evaluate the degree to which underpricing is due to Glass-Steagall restrictions. What is the evidence on the degree of underpricing of U.S. IPOs? What are the various explanations for underpricing? And what are the implications of these explanations, and of the associated empirical evidence, for commercial and investment bank regulation?

EVIDENCE ON UNDERPRICING

In "firm commitment" underwriting ("firm" in that the investment banker guarantees the price), an investment banker (and his syndicate) will undertake to buy the whole new issue of a firm at one price (the *bid* price, or BP) and seek to resell the issue to outside investors at another price (the *offer* price, or OP). In doing so, the investment banker offers a valuable risk-management service to the issuing firm by guaranteeing to purchase 100 percent of the new issue at the bid price (BP). The return for the investment banker in bearing underwriting risk—that is, the risk that investors will demand less than 100 percent of the issue when it is reoffered for sale to the market—is the spread between the public offer price and the bid price (OP - BP) plus fees and commissions. (Here,

and throughout this article, the term "investor" refers to those who buy shares through the investment banker at the offer price.) Thus, the investment banker's spread plus fees and commissions may be viewed as the *direct* cost of going public.

However, there is also potentially an *indirect* cost of going public, measured by the degree to which the issue is underpriced. For example, if the BP is \$5 per share and the OP is \$5.25 per share, then the underwriter's spread is 25 cents per share. However, suppose that on the first day of trading in the secondary market the share price (P) closes at \$7 per share. This indicates that the share has been underpriced in the new-issue process and that, potentially, the firm might have raised as much as \$7 per share had it been priced "correctly." This implies that the issuing firm has borne an additional *indirect* new-issue cost of \$1.75 per share (\$7.00 - \$5.25), because the investment banker has set the offer price below the price the market was willing to pay on the first day of trading.

Thus, more formally, the "raw" percentage degree of underpricing (UP) of an IPO can be defined as:

$$(1) \quad UP = [(P - OP) / OP] \times 100$$

where:

OP = offer price of the IPO

P = price observed at the end of
either the first trading day, week,
or month

If UP is positive, the issue has been underpriced; if UP is zero, the issue is accurately priced; and if UP is negative, it has been overpriced. The expression for UP is also the expression for a percentage rate of return. Thus, equation (1) can be viewed as the one-day (or one-week or one-month) *initial* return on buying an IPO (that is, $UP = R$, the initial return on the stock).

Returns calculated by equation (1) are deemed raw returns. However, researchers also compute excess (market-adjusted) returns, as well. The reasons for this are easy to see. Given a lag between the setting of the offer price and the beginning of trading on an exchange (anywhere from one day to two weeks or more), the price observed in the market on the first day of trading may be high (low) relative to the offer price simply because the stock market as a whole has risen (fallen) over this period. Thus, in analyzing underpricing, researchers need to control for the performance of the stock market in general. More specifically:

$$(2) \quad R_m = [(I_1 - I_0) / I_0] \times 100$$

where:

R_m = return on the market portfolio

I_1 = level of the general market share index at the time of listing (first day, first week, or first month)

I_0 = level of the market share index at the time offer is announced

If R_m is positive, the market has been going up in the time between the setting of the offer price and the listing of the stock on the stock exchange. If R_m is negative, the market has been falling. Excess market or risk-adjusted initial returns (EX) can therefore be defined as:¹

$$(3) \quad EX = R - R_m$$

According to equation (3), underpricing occurs only when R is greater than R_m .

The findings of 22 studies that examine the degree of underpricing are summarized in the table on p. 10. Although the time periods, sample sizes, and ways of calculating initial returns (especially raw versus market-adjusted) differ widely across these studies, each finds underpricing on average. For example, studies that use a one-week period to calculate the difference between the offer price and the market price of an IPO find underpricing ranging from 5.9 percent to as much as 48.4 percent.²

Thus, an important empirical fact is that U.S. IPOs are underpriced on average, resulting in small firms raising less capital than is justified by the markets' ex post valuation of their shares.

WHY ARE NEW ISSUES UNDERPRICED?

Several reasons have been proposed in the institutional, finance, and economics literature as to why underpricing occurs. Although this article will not discuss all the proposed reasons, it concentrates on four views that have received much publicity. The first view attributes underpricing to "monopoly power" enjoyed by investment bankers. The second regards Securities and Exchange Commission regulations as the primary cause. And the third and fourth see underpricing as a problem of imperfect information among contracting parties—especially between investors and issuers.

¹ For a detailed discussion of excess returns, see Robert Schweitzer, "How Do Stock Returns React to Special Events?" this *Business Review* (July/August 1989) pp. 17-29. For IPOs, researchers adjust the initial return on the stock by deducting the return on the market. This is equivalent to assuming that a new IPO's returns move exactly with the market's. That is, they have a unit degree of systematic risk (or their β is 1). The reason for this assumption is that since IPOs have no past history of returns, one cannot estimate directly the IPO's β at the time of issue. The only researcher

who has tried to address this problem was Ibbotson (1975), who developed an ingenious method of constructing synthetic β 's for IPOs.

² It should be noted that these are one week's returns and are thus very large. These underpricing "costs" swamp the direct costs of a new issue, which are, on average, in the range of 2 to 5 percent of the issue's dollar size.

The Monopoly Power of Underwriters. One possible explanation for pervasive underpricing is the monopoly power the investment banker enjoys over the issuer.³ Given that commercial banks are barred from entering into corporate equity underwriting (a result of the Glass-Steagall Act, which effectively separated commercial banking from investment banking), investment bankers may have a degree of monopoly power that they use to earn “rents” by underpricing new issues. Of course, competition among investment banks would limit the extent of this monopoly power.

But how real is this monopoly power? Compared to U.S. commercial banks, U.S. noncommercial banking firms and foreign banks have always faced fewer restrictions on entry into investment banking. Moreover, thrifts also can enter investment banking. In recent years, for example, nonbank firms such as General Electric and Prudential have entered the investment banking industry via acquisitions, as has Franklin Savings Bank, a thrift. This potential competition presumably places a limit on the degree of monopoly power enjoyed by investment bankers.

In addition, foreign banks were not subject to Glass-Steagall regulations until passage of the International Banking Act of 1978. Even then, those already possessing investment banking powers had them grandfathered. The emphasis on investment banks is due to their traditional dominance of the underwriting market and to their potential economies of scope (cost savings from offering a combination of services) in extending to their underwriting customers a broader range of financial services.

If investment bankers have monopoly power

over the new issuer, they might use it to increase both the spread between the offer price and bid price (the underwriters’ spread) as well as the degree to which the offer price is set below the markets’ true valuation (P). A monopolist investment banker might have the incentive to underprice, since by doing so he can increase the probability of being able to sell the whole issue to outside investors (thereby minimizing his underwriting risk) while earning a high investment banking spread ($OP - BP$) on the issue.⁴

Clearly, if this was the prime reason for underpricing, it would tend to make a case for allowing commercial banks into the underwriting business. This argument would be based on the expectation that pro-competitive effects would reduce the average degree of underpricing.⁵ But this argument would, of

⁴Implicitly, this argument presumes that investment bankers are risk-averse. This is reasonable, given the private nature of many companies, their limited capital bases, and the potential for a large loss if they take a “big hit” (loss) on an underwriting. For example, many U.S. investment bankers suffered significant losses in underwriting an issue of British Petroleum shares at the time of the October 1987 stock market crash.

⁵A different monopoly-based argument, advanced in Baron (1982), is that investment bankers possess monopoly power through their private access to *information* about the likely size of the demand for a new issue. Since issuers are viewed as being relatively uninformed about the nature of this demand, they can easily be exploited by the investment banker. Indeed, since the issuer has no way of knowing ex ante the size of investor demand, the underwriter has an incentive to save resources on distribution and search (“shirking”) by simply underpricing enough to ensure that the whole issue is sold. In this context, the presence of potential competitors, such as commercial banks, and the importance of maintaining a reputation might be viewed as potential controls on the investment bankers’ temptation to shirk. This presumes, however, that commercial banks, if they entered into underwriting, have the same abilities to “place” (sell to investors) a new issue as investment bankers do. In reality, it might take commercial bankers a number of years to build up the same placement powers.

³For a discussion of the reasons for and effects of investment bankers’ potential monopoly power, see Ibbotson (1975) and Pugel and White (1984).

course, be tempered by the need to maintain safety and soundness of the banking system, which could be lessened if the spread (P - OP) is small enough to risk inability to sell the entire issue.⁶

Due-Diligence Insurance. A second reason given for why underwriters underprice IPOs is the fear of potential legal problems stemming from overpriced issues. Underwriters, along with company directors, are required to exercise "due diligence" in ensuring the accuracy of the information contained in the prospectus they offer to investors.⁷ Since passage of the Securities Acts of 1933 and 1934, both underwriters and directors may be held legally responsible under SEC regulations for the accuracy of this information.

Investors who end up holding heavily overpriced issues may well have an incentive to sue the underwriter and/or the company directors for publishing misleading or incomplete information in the prospectus. The investors could contend they were misled into believing this was a "good" issue rather than a "bad" one. To avoid any negative legal effects, as well as adverse publicity and damage to reputation, a risk-averse underwriter may try to keep investors happy by persistently underpricing IPOs. Hence, some researchers believe that the legal penalties for due-diligence failures are what have created incentives for investment bankers to underprice.

The Problem of the "Winner's Curse." The academic literature has paid a great deal of attention to a theory first advanced by Rock (1986) and extended by Beatty and Ritter (1986) and McStay (1987), among others. This theory considers underpricing as a competitive out-

come in an IPO market in which some investors are viewed as informed while a larger group is viewed as uninformed. As a result, underpricing is directly related to the degree of information imperfection—or, more specifically, information asymmetry—in the capital market and to the costs of collecting information. Both this theory and the one that follows view underpricing as a way of resolving the problem of costly information collection.

In Rock's model, there are two types of IPOs: good issues and bad issues. Informed investors, defined as those who expend resources collecting information on IPOs, will bid only for those issues that are good. (This search effort is assumed to allow the informed investor to assess exactly the true value of the IPO.) Those investors who are uninformed, however, will not engage in expensive search, but rather will bid randomly across all issues, good and bad. It is further assumed that informed investors are never sufficiently large as a group to be able to purchase a whole issue.

First, consider a good issue. In this case, both informed and uninformed investors will bid for the issue (the uninformed in a random manner). Because both groups bid for the issue, it is likely to be oversubscribed, so that any single *individual* bidder (informed or uninformed) will get fewer shares than he bid for. Thus, for good issues, uninformed investors get only partial allotments.

Next, consider bad issues. In this case, informed investors will not bid at all. The only bidders will be the uninformed. Moreover, owing to the absence of competing informed bidders, any individual bidder will more likely achieve his full allotment (or a higher probability of an allotment). That is, the uninformed bidder suffers from the problem of the "winner's curse": he achieves a large allotment for bad IPOs and a small allotment for good IPOs.

Rock's argument is that, because of the winner's curse, IPOs have to be underpriced on average so as to produce an expected return for

⁶Since P is not known with certainty, a small spread (P - OP) risks occasional negative spreads, in which case the underwriting firm suffers a loss.

⁷See, for example, Tinic (1988).

the uninformed investor that is high enough to attract investment in IPOs regardless of whether the issue is good or bad.⁸ That is, underpricing is a phenomenon perfectly consistent with competitive market conditions in a world of imperfect information flows. Thus, monopoly power is rejected as an argument explaining underpricing.

Underpricing as a Dynamic Strategy. In the most recent literature, underpricing is seen as a dynamic strategy employed by issuing firms to overcome the asymmetry of information between issuing firms and outside investors.⁹ Implicitly, underpricing is viewed as a cost to be borne by the issuing firm's insiders to persuade investors to collect (or aggregate) information about the firm and in that way establish its true value in the secondary market. Moreover, the better the firm (a "good" issue), the more it will be underpriced relative to the bad issue.

Specifically, a good firm will underprice its issue to attract outside investors.¹⁰ Investors (such as analysts) collect information about the firm and, in the secondary market, establish its true value above its offer price. The owners of the firm benefit from this strategy because once the true (higher) market value is established, the owners have an incentive to "cash in" by coming out with new (further) secondary offerings at the higher market price. Thus, the cost or losses of underpricing the IPO are offset

by the benefits from cashing in on the secondary offering.¹¹

By comparison, a bad firm—one that knows it is a bad firm—will have the opposite incentives. In particular, the firm may seek to price the IPO as high as possible, since it knows that once investors collect information and discover that it is a "bad" firm, its stock's price will fall on the secondary market.¹²

As in the Rock model, these types of dynamic-strategy models view underpricing as a phenomenon that is consistent with competition in a world of imperfect information among issuing firms and investors. The difference is that, here, IPO underpricing is viewed as a cost to be borne by good firms, which is offset by the revenue benefits from making a secondary ("seasoned") offering later on at a higher price.

IMPLICATIONS FOR BANK REGULATION

What do these models imply for bank regulation and, in particular, the Glass-Steagall Act? If underpricing is indeed due to information imperfections in the capital market—especially between firms and investors—it is difficult to see how commercial banks' entry into underwriting will have much effect, unless these banks somehow collect more information and alleviate the degree of information imperfection in the market. Since the modern theory of banking views banks as major collectors and users of information, increased production of information about small firms may indeed be a benefit from repealing Glass-Steagall.

However, a better test of whether Glass-

⁸Technically, the *conditional* expected return for the uninformed investor, across both good and bad issues, must be at least as great as the risk-free rate.

⁹See, for example, Chemmanur (1989) and Welch (1988).

¹⁰In these models, the investment banker plays a largely passive function, operating as an agent on behalf of the principal (the firm). The failure of the investment banker to take a more active role may be seen as a weakness of these information-based models.

¹¹Welch (1988) offers preliminary evidence that these issues that are more underpriced tend to follow up more quickly with a secondary (seasoned) offering.

¹²This is not to imply that the bad firms necessarily overprice. However, the theory has the *aggregate* implication that the greater the proportion of good to bad issues in the market, the greater the degree of underpricing on *average*.

Steagall has undesirable costs is whether it confers monopoly power on existing investment banks that is reflected in the degree of underpricing. That is, what, if any, is the empirical evidence linking underpricing to the monopoly power of investment banks?

One implication of the monopoly-power hypothesis¹³ is that an underwriter, because of his expertise and more precise knowledge of the issuing firm's true value, can save effort (shirk) by ensuring maximum sales through underpricing while still earning a high underwriting spread (OP - BP). However, even in a world of asymmetric information, presumably firms would learn that they are being exploited and, if competition exists, would switch to other underwriters. In contrast, monopoly power would imply that issuing firms would fare as well with one investment bank as with another and that underwriters could ignore all problems or considerations related to maintaining a reputation.

Beatty and Ritter (1986) have sought to test this reputation-monopoly power effect. That is, do investment bankers who heavily underprice in one period lose business from issuing firms in the next? Beatty and Ritter's results tended to confirm that the more an investment banker underpriced in one period, the greater his loss of business in the next—a result suggesting that monopoly power is temporary at best.

A second implication of the monopoly-power hypothesis is that the investment banker—to avoid risk—will have a greater incentive to underprice relatively risky issues so as to ensure maximum sales. For example, it can be argued that the more uncertain are firms' uses of the proceeds of the issue (for example, to pay

off existing debt, to develop new projects, and so on), the riskier the issue. Or, alternatively, the more variable the after-market returns on an issue—measured by the standard deviation of returns over a period subsequent to listing on the stock exchange—the riskier the issue. Thus, we would expect underpricing to increase as the number of potential uses of proceeds, and the volatility of its (expected) price in the after-market, grows.

Beatty and Ritter (1986) found a positive relationship between number of uses of proceeds and underpricing; Ritter (1984) and Miller and Reilly (1987) found a positive relationship between the standard deviation of after-market returns and the degree of underpricing. Both these results are consistent with the monopoly-power hypothesis; however, it *must* be noted that both findings are also consistent with the competitive-market, information-imperfection “winner's curse” theory of Rock (1986).¹⁴

A third potential implication of the monopoly-power model is that the degree of underpricing should have been less prior to passage of Glass-Steagall—that is, the pre-1933 *average* degree of underpricing should have been less than the post-1933 average degree. In a recent study, Tinic (1988) tested the degree of underpricing in the period 1923-30 and compared it with the period 1966-71. He found that underpricing was higher in the 1966-71 period. While Tinic interpreted these results as consistent with the due-diligence-insurance hypothesis—that is, the passage of the Securities Act of 1934, which forced investment banks to underprice to avoid potential lawsuits—they are also consistent with the monopoly-power hypothesis. That is, in a period preceding Glass-Steagall (when commercial banks had greater power to

¹³ See Baron (1982), who developed a theory of investment banker monopoly power based on the inability of issuers to accurately monitor the investment bankers' effort in placing new shares with investors.

¹⁴ That is, the greater the risk or uncertainty about the issue, the greater the cost of becoming informed and thus the greater the degree of underpricing required in equilibrium.

underwrite corporate securities),¹⁵ the degree of underpricing was less than in a period following the Glass-Steagall separation of powers.

A fourth implication of the monopoly-power hypothesis is that IPOs of investment banks (for example, Morgan Stanley going public) should *not* be underpriced, since the investment bank brings its "own firm" public. Looking at 37 IPOs of investment banks that went public in the 1970-84 period and participated in the distribution of their own issues, Muscarella and Vetsuypens (1987) find an average degree of underpricing of 8 percent on the first day of trading. At first sight this tends to contradict the monopoly-power hypothesis as the sole reason for underpricing; however, it could be argued that 8 percent underpricing is less

than the median or mean underpricing found in the majority of studies listed in the table below and that monopoly power may offer a partial explanation for underpricing.

Nevertheless, the results favoring monopoly power as the major determinant of new-issues underpricing appear somewhat weak. Indeed, the evidence is largely consistent with the existence of competitive markets in which investors have incomplete or imperfect infor-

Initial Returns, According to Various Studies

Study	Sample Period	Sample Size	Initial Returns	
			1 Week	1 Mo.
Reilly/Hatfield (1969)	1963-65	53	9.9%	8.7%
McDonald/Fisher (1972)	1969-70	142	28.5%	34.6%
Logue (1973)	1965-69	250	—	41.7%
Reilly (1973)	1966	62	9.9%	—
Neuberger/Hammond (1974)	1965-69	816	17.1%	19.1%
Ibbotson (1975)	1960-71	128	—	11.4%
Ibbotson/Jaffe (1975)	1960-70	2650	16.8%	—
Reilly (1978)	1972-75	486	10.9%	11.6%
Block/Stanley (1980)	1974-78	102	5.9%	3.3%
Neuberger/LaChapelle (1983)	1975-80	118	27.7%	33.6%
Ibbotson (1982)	1971-81	N/A	—	2.9%
Ritter (1984)	1960-82	5162	18.8%	—
	1977-82	1028	26.5%	—
	1980-81	325	48.4%	—
Giddy (1985)	1976-83	604	10.2%	—
John/Saunders (1986)	1976-82	78	—	8.5%
Beatty/Ritter (1986)	1981-82	545	14.1%	—
Chalk/Peavy (1986)	1974-82	440	13.8%	—
Ritter (1987)	1977-82			
	Firm commitment	664	14.8%	—
	Best efforts	364	47.8%	—
Miller/Reilly (1987)	1982-83	510	9.9%	—
Muscarella/Vetsuypens (1987)	1983-87	1184	—	7.6%

¹⁵This was particularly true in 1927-33, when commercial banks had the same powers as investment banks. Since technology and the structure of the financial services industry are continuously changing, a more valid test might have been to compare underpricing in the period *immediately following* passage of the Glass-Steagall Act.

mation about new firms. While new issues did appear to be *less* underpriced before Glass-Steagall (consistent with the monopoly-power hypothesis), evidence suggests that those investment banks that excessively underprice today lose future business from prospective issuing firms and that investment banks' own IPOs are also underpriced on average (although less so than those of other firms). The gains from allowing commercial banks to compete directly with investment banks for corporate

equity underwritings may come less from creating more potential competition than from collecting, producing, and disseminating more information about small firms in the new-issue process. This conclusion suggests that allowing banks into investment banking activities may indeed bring about price changes that benefit the public; however, those changes may be smaller and occur for different reasons than once thought.

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