Chapter 6

SECURITY OFFERINGS*

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Abstract

This essay surveys the extant literature and adds to the empirical evidence on issuance activity, flotation costs, and valuation effects of security offerings. We focus primarily on public offerings of equity for cash, although we also review and present new evidence on debt offerings and private placements. The essay has four major parts: (1) We review aggregate issue activity in exchange listed securities from 1980 through 2004. Following the IPO, only about one-half of the publicly traded firms undertake a public security offering of *any* type, and only about one-quarter undertake a SEO. Thus, SEOs are relatively rare, which is consistent with adverse selection costs being an important consideration when raising cash externally. (2) We review the evidence on direct issue costs across security types and flotation methods, including the more recent SEO underpricing phenomenon. A large number of studies provide evidence on the determinants of underwriter compensation, and confirm the importance of variables capturing information asymmetries and underwriter competition. (3) We survey and interpret the valuation effects of security issue announcements. In the period since the Eckbo and Masulis (1995) survey, many studies examining announcement-period stock returns have focused on the effects of flotation method choice and foreign offerings. The well-known negative average announcement effect observed for U.S. SEOs appears to be a somewhat U.S.-specific phenomenon. (4) We review and extend evidence on the performance of issuing firms in the five year post-issue period. The literature proposes either a risk based-explanation or a behavioral explanation for the phenomenon of low average realized returns following IPOs and SEOs. Standard factor model regressions fail to reject the null that the low average returns are commensurate with issuers' risk exposures. Recent theoretical developments suggest that lower risk levels following equity issues may be linked to issuers' investment activity, a promising direction for future research.

Keywords

security offering, IPO, SEO, debt offer, flotation method, underwriting, rights offer, private placement, shelf registration, adverse selection, announcement returns, long run performance

1. Introduction

Security offerings are a very visible and important activity in the life of a firm. Their visibility arises in part because of the typically large amount of new capital raised relative to an issuer's existing capital base or asset size. The motives for security offerings are quite varied. The most common reason given for these actions is to raise capital for capital expenditures and new investment projects. Other reasons explored in the literature include the need to refinance or replace existing or maturing securities, to modify a firms capital structure, to exploit private information about securities intrinsic value, to exploit periods when financing costs are historically low, to finance mergers and acquisitions, to facilitate asset restructuring such as spin-offs and carve-outs, to shift wealth and risk bearing among classes of securities, to improve the liquidity of existing securities, to create more diffuse voting rights and ownership, to strengthen takeover defenses and to facilitate blockholder sales, privatizations, demutualizations and reorganizations.

This survey focuses exclusively on security offerings *for cash*, and then primarily to the *public*—although we also track private placements to some extent. Non-cash offerings, such as securities issued as employee compensation, and the many variants of security swaps, are covered elsewhere in this Handbook. For example, stocks issued as part of employee compensation plans are covered extensively in Aggarwal (2007, Chapter 17). Equity-for-equity swaps associated with mergers and takeovers are evidenced in Betton, Eckbo, and Thorburn (2007, Chapter 15). Security swaps associated with financial restructurings of non-distressed firms are covered in Eckbo and Thorburn (2007, Chapter 16), and senior-for-junior security swaps by firms in financial distress are examined in Hotchkiss et al. (2007, Chapter 14).

The decision to issue securities draws on all of the core areas in financial economics: asset pricing theory, capital structure theory, managerial investment incentives, financial institutions, contracting, and corporate governance. Moreover, there is a wealth of available data, particularly with the emergence in the 1990s of the comprehensive, machine-readable, transactions-oriented data base provided by the Security Data Corporation (SDC), with data back to 1980. Yet, there is surprisingly little consensus on key determinants of the security issuance decision and its economic effects on the firm.

The very existence of elaborate schemes for marketing security offerings to the public—including book building and road shows by underwriters—speaks to the importance of information asymmetries in the market for public issues. Moreover, judging from the recent regulatory focus on investor protection (e.g., the Sarbanes–Oxley Act of 2002), public security offerings for cash are relatively vulnerable to potential conflicts of interests. As such, these security issues are also the prime empirical laboratory for exploring models of capital structure choice—including the "pecking order" of (Myers, 1984)—as well as selling-mechanism designs that presume the public is substantially less informed than the issuer about the true value of the security issued.[1] While the survey provides information on the number of initial public offerings (IPOs) and private

[1] Time series evidence on the pecking order theory is surveyed in Frank and Goyal (2007, Chapter 12).

placements, the main focus is on issuances by exchange-listed firms—both seasoned equity offerings (SEOs) and debt issues.

We have four main objectives: (1) To survey the level of aggregate security issue activity and some of the characteristics of issuing firms; (2) to review direct issue costs across security types and selling mechanisms; (3) to survey and interpret the valuation effect of security issue announcements; and (4) to review and extend evidence on the performance of issuing firms in the five year post-issue period.

Mapping out the SDC data base, we start by providing an overview of aggregate issue activity in the U.S. over the period 1980–2003. We separate industrial firms from public utilities, and financial issuers from non-financial companies. We track primarily the largest security classes, such as common stock (IPOs, SEOs, and private placements) and debt (both straight and convertible), but provide some information on unit offerings, dual offerings, and foreign offerings (ADR and GDR) as well. We review potential determinants of the wave-like pattern of aggregate security offerings. At the firm level, we review evidence that links the security offering frequency through time. This includes the time period between the IPO and the first follow-on SEO, between two successive SEOs, and between debt and equity issues. Overall, this evidence confirms and generalize the early finding of Mikkelson and Partch (1986) that equity issues for cash are rare—both on an absolute level and relative to public debt issues.

Our second objective is to survey the nature and magnitude of direct issue costs, including the more recent phenomenon of SEO underpricing.[2] At the most basic level of economic analysis, firms minimize direct costs of raising capital. Yet, surprisingly few papers try to estimate the direct issue cost function. Following the adverse selection model of Myers and Majluf (1984), the literature has been preoccupied with the potential for wealth transfer caused by security offerings. We confirm the conclusion of Eckbo and Masulis (1995) that the adverse selection framework is the leading theoretical explanation for the announcement-induced abnormal stock returns for seasoned public offerings of debt and equity. However, the current evidence does not rule out the influence of direct transaction costs on a firm's issue decision, but is less supportive of wealth transfer concerns.

Understanding issue costs and the issue decision requires a thorough understanding of alternative selling mechanisms. We review how different selling mechanisms are designed to deal with different forms of information asymmetry, and the associated total issue costs. The literature here is sparse, leaving the link between contracting theory and optimal selling mechanisms design a fertile area for future research. One area in which this has immediate practical importance is in the choice between auctions and firm-commitment underwriting (fixed price) offerings, as witnessed in the recent Google IPO. Establishing the efficiency of the auction mechanism is also essential to the literal interpretation of an offering-price discount (underpricing) as "money left on the table" for shareholders of the issuing firm (Loughran and Ritter, 2002).

[2] We touch only briefly on IPO underpricing, which is the topic of Ljungqvist (2007, Chapter 7).

A third major objective of the survey is to both review and provide additional evidence on short- and long-term performance of issuing firms. In the period after the review of Eckbo and Masulis (1995), studies reporting short-term, announcement-period abnormal stock returns have focused in particular on the effect of the flotation method choice and of foreign offerings. Interestingly, the well-known negative announcement effect of the average SEO in the U.S. appears to be somewhat of a U.S.-specific phenomenon. While Eckbo and Masulis (1995) did not cover long-run performance studies, in this survey we provide our own large-scale analysis in addition to surveying the evidence in existing studies.

As in Loughran and Ritter (1995) and Eckbo and Norli (2004), we find that *total* returns are relatively low following security offerings, and in particular following IPOs. The low post-issue total return is most noticeable after IPO clusters ("hot" IPO periods). These clusters raise issues concerning selection bias and what Shultz (2003) terms "pseudo-timing" evidence. Overall, consistent with the conclusions of Eckbo, Masulis, and Norli (2000), Brav, Geczy, and Gompers (2000) and Eckbo and Norli (2005), but contrary to the inference Ritter (2003) draws from his survey, we conclude that the preponderance of the evidence fails to reject the hypothesis of zero *abnormal* returns in the post-issue period. This conclusion is robust to alternative definitions of expected returns, and it holds whether the issue is an IPO, a SEO, a private placement, or a (straight or convertible) debt offering.

The survey is organized as follows. Section 2 provides an overview of major regulatory rules and restrictions guiding security issues in the U.S. The section covers both regulations by the Securities and Exchange Commission (SEC), and self-regulatory authority rules issued by stock exchanges and the National Association of Security Dealers (NASD). Section 2 also summarizes the overall issue activity in the SDC population of U.S. issuers, 1980–2004. Section 3 reviews direct issue costs across major flotation methods, with a major emphasis on underwriting costs and understanding the underwriting process. Section 4 examines the flotation method choice and summarizes the evidence on the valuation effects of security offering announcements (both U.S. and internationally). Section 5 examines various theories for post-issue stock price performance, and presents the results of an original long-term return analysis performed on our SDC sample. Section 6 provide concluding remarks.

2. The security offering process

Equity offerings come in many colors and flavors, from IPOs to SEOs, public offers to private placements, classes of stock with differing cash flow and voting rights, from domestic issues to global issues and from warrants to employee/management stock options to convertible debt. They are also sold using many different mechanisms, from a firm commitment underwriting contract to a rights offering to a discriminatory or non-discriminatory auction, to more exotic methods such as privatizations, carve-outs,

employee stock ownership plans (ESOPs), equity bonus plans, mutual-to-stock conversions, forced conversions of convertible securities (including conversions of venture capital held securities at the IPO), equity financed acquisitions, dividend reinvestment plans and funding pension plans with your own stock.

Legal systems, tax codes, securities regulations and the treatment of investors of a country are likely to have a significant bearing on the level of security offering activity as well as the choice of flotation methods. Over the last 25 years, there have been major changes in securities regulations in the U.S. and other major capital markets. We review some of these major changes and the trends in the evolution of security regulation in the next section.

2.1. U.S. securities regulations

The U.S. regulatory environment is anchored on two major laws. The first major law is the Securities Act of 1933, which requires issuers of securities to sell the entire issue at a single offer price to all investors, to meet filing rules and extensive disclosure requirements prior to the offering date. Under the regulations implementing this law, prospective issuers must file an S-1 statement with SEC prior to the offering. Within approximately 30 days, the SEC will send the issuer a letter of comment asking for additional disclosures and request amendments to the registration statement. The issuer sends a response and after several exchanges of letters, the SEC will typically declare the registration effective. Once the filing statement is approved, the issuer can proceed with the offering. The second major act is the Securities Exchange Act of 1934 which mandates that issuers of publicly held securities make periodic disclosures through public filings of annual 10-K, quarterly 10-Q and occasional 8-K statements, when material changes occur.

There are several exemptions from the registration requirements under the Securities Act for small issues, private placements, mergers and reorganizations. While privately placed securities are exempt from registration requirements, these securities can not be resold for a year without being publicly registered with the SEC.

In recent years U.S. securities regulations have moved toward more rapid disclosure of material changes in company conditions, less delay in securities issuance and an easing of restrictions on private placements and foreign security issuance in the U.S. and the use of U.S. accounting standards under "generally accepted accounting standards" (GAAP). However, these changes appear to be more than offset for foreign issuers and small U.S. issuers by the passage of the Sarbanes–Oxley Act of 2002 which requires major changes in Board of Directors committee structure, auditor independence and certification of company financial disclosures.

As of March 1982, the SEC adopted Rule 415 Shelf Registration, which enabled public companies to sell securities more rapidly. Under the Rule, issuers register securities that can be sold from time to time over a two year period, with offer terms at each sale set in light of current market conditions and other factors. The Rule permits an issuer to avoid the delays involved in filing a new registration statement at each sale date. This

flotation method was only available to larger, financially sound issuers meeting the following requirements: common stock (with or without voting rights) having a market value of at least $75 million, no defaults on any debt, preferred stock or rental payments for 3 years, all SEC disclosure requirements have been met for the last 3 years and the firm's debt is investment grade.

Under U.S. securities regulations, a foreign issuer has a choice of issuing either publicly or privately held equity or debt in the U.S. Typically, a foreign issuer of equity in the U.S. employs an American Depository Receipt (ADR) or Global Depository Receipt (GDR) mechanism which eliminates the domestic investors need to undertake foreign exchange transactions to acquire and dispose of these securities and convert cash dividend payments to dollars. An ADR is a financial instrument backed by a depository bank owning the underlying foreign shares, to which the ADR has a fractional claim, but which pays cash distributions and trades in dollars and settles trades in the U.S. market. Arbitrage keeps the prices of the underlying shares and the ADR in close alignment after adjusting for foreign exchange movements. GDRs are similar financial instruments which pay cash distributions and trade in a specific foreign currency and settle trades on a particular foreign stock exchange.

In April 1990 the SEC approved Rule 144A, which allows immediate sale and resale of private placements to "qualified institutional buyers" (QIBs) without having to register these securities or hold them for a year, as previously required.[3] This rule was particularly aimed at reducing regulatory costs and improving the liquidity of privately placed securities issued by privately held companies and foreign issuers. It gives privately held U.S. firms the ability to either privately place securities with accredited and sophisticated investors pursuant to Section 4.2 of the 1933 Securities Act or Rule 506 of Regulation D or to sell them to QIBs as a Rule 144A issue. The approval of Rule 144A also has the effect of allowing international firms to gain access to U.S. institutional investors without having to meet the strict disclosure and GAAP accounting requirements of U.S. public companies.

Under U.S. regulation, there are several ways a foreign company can tap the U.S. capital market. A firm can first make a small Rule 144A private placement and trade over-the-counter, which is called a Level I program. If it chooses to list on a U.S. exchange, it moves to a Level II program. Alternatively, it may undertake a Level III public offer of stock in the U.S. with listing on a U.S. stock exchange. An issuer can simply undertake a large 144A private placement or a firm can begin by seeking Level I or II market listing in the U.S., followed by a public offering. One key benefit of a 144A private placement is that a foreign issuer can raise capital in the U.S. sooner, since the issuer does not have to meet U.S. accounting and disclosure standards to tap this market. However, the stock's issue price is likely to be significantly discounted for its lower liquidity in the private placement market. In addition, issuers often need to obtain

[3] QIB typically refers to an institution (e.g., insurance companies, investment companies and pension funds) that own or invest $100 million in securities of non-affiliated companies.

home market regulatory approval before initiating any foreign trading in its securities. There can also be home country restrictions on foreign sales of domestic securities and purchases of foreign securities by domestic investors.

Under Regulation T of the Securities and Exchange Act of 1934, the Federal Reserve Board of Governors establishes rules to limit the portion of a security's market value that can be loaned to the investor by a broker. These margin requirements are established for the purpose of reducing selling pressure on investors who financed their security purchases with loans. Thus, in market downturns, investors borrowing on margin are required to put up additional collateral when their securities fall in value. This can force many liquidity impaired investors to sell securities to raise collateral or if they fail to meet the call for added collateral, the broker can sell their securities and close out their margin loans. Either event can create a cascading pattern of sell orders, which has been alleged to destabilize the stock market.

The SEC regulates the financial condition of brokerage firms and the short selling of securities by investors and underwriters. In the normal case of investor short selling, brokerage houses and institutional investors lend securities to short sellers, who immediately sell these securities in the stock market, knowing that at a future date they will be obligated to purchase these same securities in the stock market to close out their short positions with their lenders.

SEC regulations concerning public offerings of securities underwent sweeping changes as of December 1, 2005. One major innovation is the creation of a new category of issuers called "well known seasoned issuers" (WKSI) with special filing exemptions. WKSIs are publicly listed firms (involuntary filers) that are eligible to issue shelf offerings, which are current and timely in their reporting obligations over the past year. They must also meet one of two conditions; (1) have outstanding a minimum of $700 million of common equity market capitalization world-wide that is held by non-affiliates, or (2) if they are only registering non-convertible securities other than common equity, that during the past three years they have issued non-convertible securities other than common equity in registered primary offerings with an aggregate value of $1 billion.[4]

Under the new rules, a WKSI can have oral or written communication with investors before during and after the offering process. WKSIs are also given automatic shelf registration status. They are permitted to register unspecified amounts of different specified types of securities on Form S-3 or F-3 (only non-convertible securities excluding common equity if only condition (2) above is met) without allocating between primary and secondary offerings. These registration statements are automatically effective on filing without SEC review. Issuers can also add further classes of securities and eligible majority owned subsidiary securities after the registration statement is effective, provided they make a post-effective amendment to the offering's registration statement.

[4] Majority owned subsidiaries of these firms also may be considered to be "well-known seasoned issuers" if the securities issued are non-convertible securities other than common equity, are fully and unconditionally guaranteed by the parent and are of investment grade.

A second major change in SEC regulations is increased disclosure requirements in registration statements and 10-K statements concerning risk factors. Third, Rule 415 will no longer limit the amount of securities registered on a shelf registration statement to an amount intended to be offered and sold within two years of the effective date of the registration statement. In practice the SEC has allowed shelf registration statements to remain effective for many years. Under the new rules, the shelf registration can only be used for three years. The new rules allow seasoned issuers to conduct primary offerings immediately after the effectiveness of a shelf registration statement. Shelf issuers may also conduct "at-the-market" equity offerings (sales at varying prices rather than a conventional fixed price offer) without existing volume limitations and without needing to identify the potential underwriters.

WKSIs are permitted to omit the plan of distribution, the names of any selling security holders, the description of securities to be offered, and the allocation between primary and secondary shares. This information can be incorporated in prospectus supplements and post-effective date amendments to the shelf registration statement.

Foreign private issues are able to take advantage of the relaxation of the gun-jumping rules (communications occurring prior to the effective date of the registration statement) and the revised shelf registration rules to the same extent as domestic issuers. Moreover, automatic shelf registration will make it much easier for foreign private issuers that are WKSIs to conduct rights offerings in the U.S.

Other changes in SEC regulations include giving issuers a safe harbor from being in violation of security regulations for written communications of regularly released factual information made before or during an offering and commonly released forward-looking information (e.g., earnings forecasts) made before or during an offering, allowing issuers a wider range of oral and written communications while the offering is in registration, allowing electronic delivery of filing materials to shareholders, and allowing analysts reports of new issues under a wide range of situations, even for analysts affiliated with an underwriter.

Parallel to U.S. securities regulation, there are similar national regulatory authorities around the globe. The International Organization of Securities Commissions (IOSC) is a global organization of national security regulators created to foster cooperation in promoting high standards of regulation in order to maintain efficient and sound capital markets; to establish standards and effective surveillance of international securities transactions and to promote effective enforcement of these standards. Among its recent achievements, the IOSC in 1998 adopted a comprehensive set of objectives and principles of securities regulation, which today are recognized by the world financial community as international benchmarks for all markets. In 2002 the IOSC endorsed a memorandum of understanding among securities regulators around the world, designed to facilitate the enforcement of security regulation and the exchange of information. Looking internationally, there has been an increase in disclosure regulation and increased regulation and enforcement of insider trading activity.

In addition to securities regulation, several other recent laws and rules of self regulatory organizations also have impacted the security offering process. In 1999, the

Glass–Steagall Act which prohibited commercial banks and their subsidiaries from affiliating with securities firms or underwriting corporate securities was effectively repealed by the Gramm–Leach–Bliley Financial Modernization Act. The passage of this law had a direct effect on the securities market by increasing competition for corporate underwriting assignments by allowing entry by commercial banks who could have prior lending relationships with issuers (see also Drucker and Puri, 2007, Chapter 5, this volume).

Self-Regulatory Authorities (NYSE, NASD) impose various listing requirements on firms trading securities on their exchanges. In addition, the NASD has responsibility for regulating many of the activities of broker-dealers and underwriters. In recent years, both the NYSE and the Nasdaq have imposed new corporate governance requirements on firms listing in their markets. The NYSE also prohibits listed firms from inducing dual shares with unequal voting rights since 1994.[5]

The passage of the Sarbanes–Oxley Act of 2002 has enhanced shareholder voting rights by encouraging more independent boards and requiring outside directors take on major governance roles within the board of directors. This Act has increased the credibility of firm disclosure requirements by requiring greater auditor independence and the CEO and CFO to personally certify the company's annual financial statements.

2.2. Alternative flotation methods

Table 1 summarizes the major flotation method choices observed for IPOs, SEOs and debt offerings. The table starts with "firm commitment" underwriting, which is the primary choice of publicly traded U.S. firms. Here, an underwriter syndicate guarantees the proceeds of the issue (net of fees) and organizes the sale of the shares. Given the prominence of this flotation method, we discuss key aspects of the underwriting process before commenting on the other flotation methods listed in Table 1.

2.2.1. The firm commitment underwriting process

The time line in a firm commitment offering is roughly as follows: The issuer contacts an investment bank to form a syndicate guaranteeing the offering. The lead underwriter performs due diligence (examining the financial status of the issuer), registers the issue with the SEC, and presents a preliminary prospectus ("red herring") to key investors and clients in a "road show". The preliminary prospectus specifies only a possible price range for the offering as the firm is not permitted to sell shares prior to SEC registration. When the SEC approves the issue, the firm meets with the underwriter syndicate and sets the final offer price ("pricing meeting") and the offer typically starts the following day. The underwriter guarantee requires a firm offer price, so the guarantee period starts

[5] Exceptions are firms with dual class shares prior to listing such as Ford Motor Co., Berkshire Hathaway, which was grandfathered when these requirements were first implemented.

Table 1
Flotation methods

Firm commitment. An underwriter contractually commits to purchase an entire security issue at a fixed price discount from the public offering price. All shares are sold to the public at the same price and the underwriter generally has the power to allocate the issue if there is excess demand. This process may involve book building or a fixed price placing

Rights. Short lived in-the-money warrants to buy a fixed number of new shares at fixed price, which are distributed to existing shareholders on a pro rata basis. These rights can often be resold to other investors. On the warrant expiration date, unexercised warrants are sometimes redistributed to shareholders who do exercise their rights

Standby rights. These contracts represent rights offers combined with a standby underwriting contract. The underwriter guarantees to exercise all unexercised warrants delivered to them at the warrant expiration date. Underwriter will often short-sell the stock and buy rights in the secondary market ("layoff") during the offering period to the lessen uncertainty about the number of unexercised warrants they will need to exercise and to receive higher compensation. Compensation is in form of a fixed pre-commitment fee and a variable take-up fee that is proportional to the number of rights exercised by the underwriter

Private placement. An issuer privately negotiates a sale of stock to qualified investors. There are registered private placements and restricted private placements. Resale of the stock is generally restricted to other qualified investors for one year, unless the issue has an effective registration statement covering the resale of these securities. Restricted private placements are unregistered offers (no prospectus is required) that fall under Regulation D or Regulation S. Regulation S private placements are sold outside the U.S., while Regulation D allows private placements within the U.S. Regulation D prohibits an issuer from soliciting the general public under Rules 505 and 506. Under Regulation D, issuers of private placements are exempt from SEC disclosure requirements such as having a prospectus. Issuers must target mostly accredited investors (wealthy or sophisticated investors). Issuers may distribute an offering memorandum, but cannot advertise or solicit investors. If unaccredited investors participate in the offer, then the offering size is limited to $5 million under Rule 505, though the number of accredited investors also involved is unlimited. Under Rule 506, the offer size is unlimited, but the number of accredited investors is limited to at most 35

PIPE (Private investments in public equity). Private investment in public equity. A public company sells equity through a privately negotiated sale. These offering may or may not include some form of issuer price guarantee against a subsequent share price drop, but they generally include a large discount from the security's market price

Shelf issue. Financially strong public companies can register to sell up to a certain number of shares over the next two years using a list of possible underwriters. The registration allows the sale of one or more equity issues or alternatively the sale of one or more debt issues, the choice of debt or equity must be made at the filing date

Universal shelf issue. Similar to shelf issues except that the issuer can choose to sell either debt or equity

Direct public offering. Issuer sells equity directly to investors without the use of bank as a financial intermediary. If the sale involves interstate distribution of the securities, then a brief filing statement with the SEC is required. A short form registration of an offering under $5 million in a 12 month period is allowed under Regulation A. Under Regulation D, Rule 504 provides for offerings up to $1 million in a 12 month period by filing a Form D (Form D registration or small corporate offering registration (SCOR).

(*Continued on next page*)

Table 1
(*Continued*)

Best effort. Investment banks do not underwrite these security issues, instead they only guarantee to do their best to sell/market the issue. If less than a fixed percentage of an issue is sold, the entire issue is usually cancelled

DRIPS. Dividend reinvestment plans allow shareholders to buy more shares in lieu of receiving cash dividends. The shares may be sold at a small discount.

Sealed bid auction. This is a traditional method of selling IPOs. Typically a fixed number of shares are sold on a specific date, where the rules of the auction are publicly announced considerably in advance of the auction date. Sealed bids can generally be submitted over a specified period of time for a specific number of shares. The auction can be fixed price so that all accepted bids are paid the same purchase price (Dutch auction), or it can be a discriminatory auction where each accepted bid pays the bid price (Boston auction). In a nondiscriminatory auction, investors bid for parts of an issue at their bid price. Bids are ordered and a stop out price is determined where demand equals shares offered. All shares are sold at that price to those investors bidding at the stop-out price or higher. In a discriminatory auction, all offers at or above the stop-out price are accepted, but each investor pays the price they bid. Prior to the auction rules are announced concerning the bidding process, determination of the bidder purchase price and share allocation process. There are also often minimum bid price requirements. Other more complicated rules are also possible and are typically used in privatizations

with the pricing meeting and expires at the end of the offer period. Since the typical (successful) offering is fully sold out over a couple of days, the effective firm commitment guarantee period is also typically short.

The following summarizes key aspects and terminology associated with the firm commitment underwriting process.

Board of directors approval. Approval is necessary before an offering can occur and it is also necessary to get prior shareholder authorization of any shares that will be issued, though most companies typically have shareholders authorize large numbers of shares far in advance of their possible use.

Choice of lead underwriters. Competing underwriters make presentations to the issuer, though many publicly listed issuers have long standing investment banking and commercial banking relationships with one or more potential underwriters.

Advisory role of underwriters. Lead underwriters advise the issuer on the security's price, the timing of the offering, the size of the offering, desirable and undesirable offering characteristics, road show mechanics and meeting various regulatory requirements.

Syndicate formation. Lead (and co-lead) underwriters often line up other banks to help underwrite and distribute shares. Syndicate members sign legal contracts to underwrite or distribute a certain number of shares in return for underwriting and distribution fees. Lead underwriters tend to take the largest portion of the underwriting risk. In most underwriting contracts, all banks share in any loses associated with unsold shares that are later resold in the secondary market.

Syndicate roles and compensation. Lead underwriters form and coordinate syndicates and receive the management fees. Some banks share underwriting risk and underwriting fees while other banks may help distribute shares and receive distribution fees. Lee et al. (1996) discuss the typical breakdown of underwriting syndicate compensation for IPOs.

Due diligence investigation. Underwriters must investigate the issuer and certify that the issue price is fair.

Prospectus. An issuer must produce a document describing the security offering and its financial condition with the help of its underwriter. The due diligence investigation helps assemble the information needed to meet SEC filing requirements.

Registration process. An issue must be registered in advance with the SEC. This must include a preliminary prospectus or red herring and later a final prospectus. In the U.S. and many other countries this will include an initial price range for the proposed offering.

Effective date. Security registration statements that must be filed prior to a security offering are said to be effective after they are reviewed by the SEC staff and any concerns are resolved. The date of SEC approval is termed the effective date of the security offering's registration statement, after which selling of the issue can occur.

A seasoned issuer. A reporting company that is eligible to use SEC Form S-3 or F-3 to register primary offerings of securities.

A well-known seasoned issuer. Publicly listed firms (involuntary filers) eligible to issue shelf offerings, which are current and timely in their reporting obligations over the past year. They must also (1) have outstanding a minimum of $700 million of common equity market capitalization world-wide that is held by non-affiliates or (2) if they are only registering non-convertible securities other than common equity, they have issued non-convertible securities other than common equity in registered primary offerings for cash $1 billion aggregate amount of during the past three years.

Exchange listing process. An issuer may seek a preliminary assessment of whether subsequent to a successful offering its stock is likely to meet an exchange's listing requirements. Plans to list on an exchange will be reported in the registration document.

Quiet period. U.S. regulation which prohibits firms going public and their underwriters from disclosing sales and earnings forecasts not in the prospectus starting before the firm announces its IPO and ending 40 calendar days after the offer.[6] This also precludes stock analysts affiliated with an underwriter from covering the stock of an IPO for the same period.

[6] Prior to July 2002, the quiet period only lasted until 25 calendar days after the IPO.

Road show. To market a security offering, senior management and the lead underwriters travel to major cities to meet with potential investors to discuss the planned offering. An exemption to the "quiet period" regulations allows managers and underwriters to make limited oral disclosures during road show presentations, where attendance is restricted to institutional investors. However, in practice most managers and underwriters try to avoid releasing new information. Thus, this process may be more an information gathering and marketing effort by an underwriter than an information session that offers investors new information about the issuer.

Book building process. Underwriters solicit tentative offers from a select group of institutional investors and other potential investors to buy shares. Bids can be in several forms: strike bids to buy a specific number of shares at almost any market clearing price, limit bids where an investor submits a bid for a specific number of shares at a specific offer price and step-bids where an investor submits a number of limit bids for specific numbers of shares at different offer prices. The underwriter can use its allocation ability to reward investors for revealing information on demand in the book building process. Generally, investors can submit bids until the book closes and can revise or cancel their bids. This process may cause the issuer to revise the price range, which will necessitate filing an amendment with the SEC. At the end of this process the underwriters will have reasonably good estimate of institutional investor demand for the issue. Of course small retail investors may have a very different demand for the issue.[7]

Signing underwriting contract and setting the offer price. The Underwriter accepts security issue price risk when it signs the Underwriting Agreement to purchase the entire security issue at an agreed upon fixed price, usually within 24 hours of the start of the public offering. It is at this point that the final prospectus is printed. On the morning of the chosen offer date, the underwriter files a "price amendment" with the SEC on behalf of the issuer specifying the security's offer price. As Smith (1977) notes, this is similar to the underwriter selling a put option on the security issue to the issuer for a fee. Underwriters reject some potential issuers and vice versa when they disagree on the level of risk and the appropriate fee or when the underwriters are unable to meet all the potential demand for their services. Underwriters can also back out of tentative commitments to underwrite issues up until the day before the public offering date.

Allocation of offering and overselling of offering. The syndicate generally oversells the issue since the orders are not legally binding and can be withdrawn, though withdrawals are likely to trigger future loss of allocations in offerings. The lead underwriter generally determines who is allowed to buy shares in a hot offer and how much of their order is filled. These investors tend to be good (large) customers of the underwriter.

[7] For further analysis of the book building process in IPOs, see the studies by Benveniste and Spindt (1989), Benveniste and Wilhelm (1990), Cornelli and Goldreich (2001), Cornelli and Goldreich (2003) and Sherman and Titman (2002).

Some issues are also allocated to friends and family of the issuer's management and to CEOs of companies the underwriter is cultivating for future business.[8]

Public offer date activities. Underwriters confirm investor orders, allocate hot issues, and may buy shares in the secondary market to meet some of their commitments as a result of overselling the issue when the after-market price isn't rising relative to the offering price.

Analyst coverage commitment. Lead underwriters, co-managers and other syndicate members often commit to produce analyst coverage for the stock for a period after the offering. This is likely to enhance investor interest in the stock and improve the stock's liquidity. A survey of issuer managers finds that underwriter selection is strongly influenced by whether an underwriter has reputable industry analysts.[9]

Market making commitment. Lead underwriters generally commit to be active market makers in the stock for a period of time after the offering. Existing evidence shows that this market making is very important in the early seasoning of an issue, but typically declines in importance over the first year following listing. This market making activity is typically profitable for the lead underwriter.[10]

Price support. Lead underwriters often place limit orders to buy shares immediately after an offering without being subject to price manipulation restrictions. If an underwriter oversells an offering, which afterwards drops in price, then the underwriter can buy additional shares in the secondary market at a price at or below the offering price, rather than exercise its over-allotment option to buy additional securities from the issuer. This has the effect of supporting the secondary market price and avoids adding more shares into the secondary market. If the secondary market price rises relative to the offering price, then no price support activity is necessary. Instead, the underwriter can meet its commitments to customers of oversold issues by exercising its over-allotment options to buy shares at the offer price net of the underwriter discount.[11]

Lock-up agreements. Insiders and other large holders such as venture capitalists commit not to sell their shares for a period of time after the offering. The typical lock-up period is 180 days for IPOs. If the secondary market reception for the issue is very strong, the agreements may be terminated early.[12]

Insider trading regulation. U.S. SEC Rule 10b-5 prohibits a person in possession of material non-public information from using it to buy or sell company securities or to tip

[8] See Cornelli and Goldreich (2001, 2003) and Jenkinson and Jones (2004) for evidence on the book building and share allocation process and Loughran and Ritter (2002) for evidence of spinning.

[9] See Krigman, Shaw, and Womack (2001) and Brau and Fawcett (2006).

[10] For an analysis of post-IPO market making by underwriters see (Ellis, Michaely, and O'Hara, 2004).

[11] Price support or stabilization activity for IPOs is studied by Aggarwal (2000), Boehmer and Fishe (2003) and Cotter, Chen, and Kao (2004) and Lewellen (2006).

[12] The lock-up process and its expiration effects are studied by Brav and Gompers (2003), Field and Hanka (2001), Field, Cao, and Hanka (2004) and Brau, Lambson, and McQueen (2005).

others who do so. There is also a filing requirement after the sale or purchase by insiders of the firm's securities.

2.2.2. Other major flotation methods

Table 1 gives a summary of the various flotation methods available for security offerings. A more detailed description of these flotation methods follows.

In a "rights offer" current shareholders are given the right to purchase a (pro rata) portion of a new equity issue at a fixed price. A rights offer in the U.S. typically expires after a period of typically one month. The rights offer price is initially set at a discount from the current market price, but if the market price falls, the rights offer can end up being at a premium, which is likely to result in offer undersubscription or offer failure. Thus, a rights offer is like a short-lived in-the-money warrant distributed to current shareholders in the same manner as a stock dividend. It is also similar to a stock dividend in that the sale of new shares at a discount has the effect of diluting the current share price. Rights may or may not be transferable and unsubscribed rights may be reallocated among subscribing shareholders. In these non-underwritten offers, the issuer bears a risk of offering failure, but this risk can be reduced by increasing the size of the offering price discount.

In a "standby rights offer" the firm making the rights offer hires an underwriter to "stand by" and guarantee to take up whatever portion of the rights offer shareholders leave unsubscribed. The standby underwriter as a consequence bears price risk, and carries out a due diligence investigation and may pursue a book building process described above for firm commitment offerings. For these services, the underwriter charges a fixed "standby" fee. In addition, the underwriter typically charges a "takeup" fee on each share taken up under the guarantee. If there is a secondary market in the rights, it is common for the underwriter to be the primary purchaser of these rights.

In a private placement, the firm places the entire issue with a single investor or consortium of investors, bypassing current shareholders. As listed in Table 1 and discussed above, such issues are subject to a number of regulations primarily designed to protect investors.

A "shelf" offering refers to an issue that has been pre-registered with the SEC. With the introduction of SEC Rule 415 in 1983, financially strong companies are allowed to sell up to a certain number of shares over the next two years using a list of possible underwriters. Thus, shelf registration increases the flexibility and speed of issue over a two-year period.

Auctions present another mechanism for selling equity. This method is only rarely used in the U.S. (it was used recently by Google), but has been an important method in certain international markets including France. The auction design is flexible, but the most common is a sealed bid auction where all accepted bids pay the same price. There are often minimum bid (reserve) price requirements (see Dasgupta and Hansen (2007) and Jagannathan and Sherman (2006) for details on IPO auction procedures).

Table 2
Flotation methods used to sell various types of securities

Security type	Flotation method
IPOs	Firm commitments, Auctions, Direct offerings, Private placements, Best efforts, Privatization methods, Mutual to stock conversions
SEOs	Firm commitments, Shelf issues, Universal shelf issues, Private placements, Direct offerings, Rights, Standbys, Auctions, Best efforts, Equity financed acquisitions, PIPES, DRIPS, ESOPs, Equity based bonus plans, Equity for debt exchange offers and swaps, Privatization methods
Convertible offers	Firm commitments, Private placements, Auctions, Direct offerings, Shelf issues, Universal shelf issues, Convertible debt for equity exchange offers and swaps, Convertible debt financed acquisitions
Debt offers	Firm commitments, Private placements, Auctions, Shelf issues, Universal shelf issues, Debt for equity exchange offers and swaps, Debt financed acquisitions
Private debt	Direct offerings, Private placements, Venture capital
Private equity	Direct offerings, Private placements, Venture capital

A detailed economic analysis of the flotation method choice is given in Section 4, below. As indicated there, the importance of the various flotation methods listed in Table 1 varies across countries, with issuers in larger capital markets exhibiting different preferences than those in smaller capital markets. In the U.S. nearly all IPOs are sold through a book building mechanism. Internationally, a firm commitment contract with book building is the dominant IPO issuance method in most large capital markets, while auction methods are dominant in smaller capital markets with more concentrated share ownership. For evidence that IPO flotation methods vary across countries, see the survey of international IPOs by Loughran, Ritter, and Rydqvist (1994), and Ritter (2003).

Table 2 describes the flotation methods used to sell various types of securities. As the table highlights, seasoned equity issues and debt issues use a wider array of offering methods. Debt offerings tend to rely on the same flotation methods as seasoned equity issues. In the U.S., the primary SEO flotation methods are: firm commitment underwritten offers (either syndicated or not, U.S. or global), shelf registered offers (either equity or universal), standby underwritten rights offers, rights offers, best efforts, direct issues and private placements. Outside the U.S., the primary flotation methods used are rights and standby offers, however, auctions, bought deals, installment sales and other methods are also important. Some capital markets have their own particular flotation methods including the U.K., France and Singapore. Privatization methods tend to be very idiosyncratic across countries as is highlighted in a survey by Megginson and Netter (2001).

IPO flotation methods vary across capital markets of differing size as discussed in Loughran, Ritter, and Rydqvist (1994), and Ritter (2003). In the U.S. nearly all IPOs

are sold through a book building mechanism. Internationally, the firm commitment book building method is dominant in most large capital markets, while auction methods are dominant in smaller capital markets with more concentrated share ownership, though there is some question as to whether auctions are successful more because book building is unavailable due to regulation or minimum offer size. Jagannathan and Sherman (2006) examine why IPO auctions are unsuccessful in the U.S. market.

2.3. Aggregate issuance activity, U.S. 1980–2003

2.3.1. Offering frequencies and cash proceeds

In order to understand the patterns in security issuance activity by U.S. firms, we start with the grand population of 91,455 issues from the SDC over the period 1980–2003. We then eliminate 8,173 issues for which we are unable to match the issuing firm's name and Cusip number in Thomson Financial's SDC database with a corresponding exchange-listed firm name on the University of Chicago CRSP daily stock master file for the issue year. This leaves a total of 83,282 issues for analysis. We then restrict our focus to the following seven major security classes:

(1) Public offerings of straight debt ($N = 37{,}398$, of which 18,662 are shelf offerings),
(2) Private placements of straight debt ($N = 17{,}948$, of which 5,983 are reg-144A offerings),
(3) SEOs ($N = 11{,}151$, of which 1,645 are shelf offerings),
(4) Equity IPOs ($N = 9{,}987$, of which 1,063 are "unit" offerings–with warrants),
(5) Private placements of equity ($N = 2{,}145$, of which 83 are SEC regulation 144A offerings),
(6) Convertible debt offerings ($N = 1{,}545$), and
(7) ADRs (American depository receipt stock offerings, $N = 453$).

After excluding 2,655 "other" security issues, we are left with a sample of 80,627 security offerings.

Table 3 shows the annual frequency of offerings across the seven major security offering categories. A number of regularities emerge from this table:

- For both IPOs and SEOs, the number of issues exceed 600 in years 1983, 1993, 1996 and 1997 (particularly "hot" issue markets).
- The total number of straight debt offerings outnumber the total number of SEOs by approximately three to one (37,298 vs. 11,151).
- Firms use the shelf registration procedure for approximately half of the debt issues (18,662 of 37,398), while fifteen percent of the SEOs are shelf issues (1,645 of 11,151).
- Straight debt is issued through private placements in one-third of the offerings (17,948 of 55,346 straight debt offerings), while one in six equity issues are sold in private placements (2,145 of 13,296 seasoned equity issues).
- In approximately ten percent of the IPOs, the stock is sold with stock warrants, which is termed a unit offering.

Table 3
Annual distribution of the population of 80,627 security issues in the U.S., 1980–2003

Year	Equity IPOs			Seasoned equity offerings			Public straight debt offerings		
	All	Regular	Unit	All	Regular	Shelf	All	Regular	Shelf
1980	127	108	19	382	382	0	314	314	0
1981	303	267	36	416	416	0	254	254	0
1982	117	98	19	444	417	27	375	226	149
1983	659	574	85	813	672	141	324	135	189
1984	332	261	71	251	242	9	376	164	212
1985	339	287	52	400	391	9	554	251	303
1986	675	584	91	507	500	7	860	322	538
1987	529	447	82	314	311	3	626	232	394
1988	276	234	42	140	139	1	529	197	332
1989	237	183	54	230	229	1	555	202	353
1990	205	175	30	188	184	4	468	146	322
1991	398	349	49	508	498	10	1327	627	700
1993	805	729	76	736	706	30	1789	953	836
1994	631	539	92	474	438	36	1597	676	921
1995	572	508	64	619	535	84	2253	945	1308
1996	857	785	72	767	674	93	2626	1084	1542
1997	606	570	36	736	518	218	3440	1493	1947
1998	380	371	9	562	360	202	3704	1634	2070
1999	531	523	8	438	354	84	3488	2051	1437
2000	382	378	4	397	304	93	3172	1953	1219
2001	126	119	7	427	244	183	2873	1680	1193
2002	169	166	3	422	255	167	2596	1410	1186
2003	128	128	0	502	267	235	2160	1197	963
All	9987	8924	1063	11151	9506	1645	37398	18736	18662

Year	PP straight debt			PP common stock			Conv. debt	ADR
	All	Regular	Reg-144a	All	Regular	Reg-144a		
1980	2	2	0	0	0	0	93	2
1981	365	365	0	29	29	0	88	1
1982	429	429	0	34	34	0	66	3
1983	462	462	0	51	51	0	113	10
1984	408	408	0	37	37	0	66	9
1985	553	553	0	69	69	0	138	2
1986	735	735	0	67	67	0	203	6
1987	864	864	0	53	53	0	146	16
1988	1160	1159	1	80	80	0	35	8
1989	971	971	0	99	99	0	61	8
1990	907	892	15	69	66	3	33	2
1991	987	870	117	90	77	13	49	12
1992	956	764	192	89	84	5	63	19
1993	1234	806	428	96	88	8	89	39

(*Continued on next page*)

Table 3
(*Continued*)

Year	PP straight debt			PP common stock			Conv. debt	ADR
	All	Regular	Reg-144a	All	Regular	Reg-144a		
1994	906	639	267	93	75	18	33	49
1995	623	413	210	64	60	4	30	34
1996	623	294	329	50	49	1	44	69
1997	865	290	575	58	58	0	43	56
1998	1006	309	697	49	40	9	23	19
1999	812	252	560	66	64	2	27	23
2000	543	126	417	89	87	2	31	19
2001	833	142	691	265	258	7	43	13
2002	705	103	602	256	249	7	11	15
2003	999	117	882	292	288	4	17	19
All	17948	11965	5983	2145	2062	83	1545	453

The SDC source contains a total of 91,455 issues over the 24-year sample period. Of these, 8,173 are excluded as the issuing firm could not be identified on the University of Chicago CRSP file using the SDC name and Cusip number and the CRSP Permno. Moreover, another 2,659 offerings are excluded as they do not belong to any of the issue categories shown below. "PP" denotes private placement; "Unit" offerings are equity offerings with warrants; "Shelf" offerings are pre-registered under SEC Rule 415; "ADR" denotes American depository receipt; and "Reg-144a" denotes private placement to a qualifying investor under SEC regulation 144a.

- Convertible debt issues represent only three percent of all debt issues (1,545 of 56,891) and has remained relatively stable in annual terms since 1990.
- ADRs represent 4% of all SEOs and have remained relatively stable in annual terms since 1991.

Table 4 provides the annual distribution of offering proceeds (in $billion) from the offerings in Table 3. Over the 24-year period, the proceeds from all offerings are in excess of $12 trillion. Dividing through by the total number of issues reveals the following interesting regularities concerning average issue sizes:

- The average IPO is 21% smaller than the average SEO: $68 vs. $86 million.
- The typical public debt issue is about three times the average SEO: $230 vs. $86 million.
- Private placement issues are roughly half the size of public issues: $46 vs. $86 million for SEOs, and $122 vs. $230 million for public debt issues.
- For SEOs, shelf offerings are on average twice as large as traditional registered offerings: $149 vs. $75 million.
- For public offerings of straight debt, shelf issues are on average slightly smaller than traditional registered offerings, $211 vs. $250 million.
- Convertible debt issues are of the same average size as the privately placed straight debt issues: $119 vs. $122 million.

Table 4
Annual distribution the total of $12,820 billion issue proceeds from the population of 80,627 U.S. security issues, 1980–2003 (all numbers in $billion)

Year	Equity IPOs			Seasoned equity offerings			Public straight debt offerings		
	All	Regular	Unit	All	Regular	Shelf	All	Regular	Shelf
1980	1.23	1.15	0.08	11.57	11.57	0.00	32.26	32.26	0.00
1981	2.96	2.76	0.19	12.17	12.17	0.00	26.69	26.69	0.00
1982	1.33	1.27	0.06	15.33	13.48	1.84	32.47	18.59	13.87
1983	12.37	12.02	0.35	25.80	19.06	6.73	30.69	11.36	19.33
1984	3.83	3.53	0.30	6.14	5.63	0.50	46.12	20.05	26.08
1985	8.44	8.10	0.34	16.40	15.58	0.83	66.56	25.89	40.67
1986	21.57	21.21	0.36	21.04	20.52	0.52	130.61	45.60	85.00
1987	23.88	23.44	0.45	17.34	17.23	0.10	97.65	37.04	60.61
1988	23.75	23.44	0.31	6.13	6.08	0.04	88.26	36.24	52.02
1989	13.39	13.16	0.23	9.35	9.28	0.07	94.56	36.01	58.55
1990	10.11	9.92	0.19	9.04	8.93	0.11	79.40	21.36	58.04
1991	25.71	25.37	0.34	33.38	32.09	1.28	164.12	62.90	101.22
1992	40.30	39.68	0.62	34.29	33.41	0.88	235.56	99.52	136.04
1993	56.45	55.89	0.56	49.75	45.80	3.94	316.84	147.13	169.71
1994	33.32	32.65	0.67	31.83	27.76	4.08	243.10	130.09	113.02
1995	30.14	29.36	0.77	52.23	44.47	7.76	350.95	189.06	161.90
1996	49.50	48.74	0.75	66.36	56.44	9.92	410.91	228.62	182.28
1997	41.04	40.61	0.43	75.05	48.97	26.08	542.47	297.81	244.66
1998	42.60	42.50	0.10	62.06	41.89	20.16	799.35	431.16	368.19
1999	59.37	59.29	0.07	86.95	67.79	19.16	845.74	491.40	354.34
2000	54.43	54.40	0.03	99.19	70.20	28.99	835.86	444.07	391.79
2001	38.39	38.07	0.32	78.05	39.00	39.06	1075.83	594.64	481.19
2002	42.08	41.96	0.12	68.59	32.76	35.83	974.32	560.79	413.54
2003	40.87	40.87	0.00	70.99	35.51	35.48	1107.35	701.98	405.37
All	677.05	669.40	7.65	959.00	715.64	243.36	8,627.70	4,690.26	3,937.43

Year	PP straight debt			PP common stock			Conv. debt	ADR
	All	Regular	Reg-144a	All	Regular	Reg-144a		
1980	0.08	0.08	0.00	0.00	0.00	0.00	4.23	0.09
1981	10.89	10.89	0.00	0.16	0.16	0.00	4.57	0.06
1982	15.63	15.63	0.00	0.27	0.27	0.00	3.18	0.19
1983	21.24	21.24	0.00	0.34	0.34	0.00	6.11	0.62
1984	25.31	25.31	0.00	0.60	0.60	0.00	4.09	0.61
1985	43.63	43.63	0.00	1.31	1.31	0.00	7.10	0.03
1986	65.52	65.52	0.00	1.78	1.78	0.00	9.71	0.37
1987	65.67	65.67	0.00	2.12	2.12	0.00	9.68	4.40
1988	102.10	101.61	0.48	2.84	2.84	0.00	3.14	1.10
1989	99.64	99.64	0.00	7.27	7.27	0.00	5.42	0.91
1990	66.54	64.51	2.03	3.83	3.79	0.03	4.76	0.14
1991	56.46	48.64	7.83	4.03	2.62	1.41	7.83	3.13
1992	52.82	35.98	16.84	3.86	3.48	0.39	6.71	4.23

(*Continued on next page*)

Table 4
(*Continued*)

Year	PP straight debt			PP common stock			Conv. debt	ADR
	All	Regular	Reg-144a	All	Regular	Reg-144a		
1993	81.97	41.58	40.39	3.28	1.86	1.42	9.41	7.26
1994	56.82	29.67	27.15	2.62	0.88	1.75	4.42	8.63
1995	50.67	23.10	27.57	2.20	1.80	0.39	6.31	5.18
1996	65.01	19.10	45.91	4.99	4.95	0.04	6.69	10.48
1997	134.73	18.36	116.37	5.55	5.55	0.00	8.97	9.85
1998	189.95	30.07	159.88	5.89	5.46	0.43	14.22	8.09
2000	170.50	11.46	159.04	9.70	9.48	0.22	15.58	7.92
2001	277.67	15.16	262.51	13.74	10.94	2.79	18.54	4.20
2002	135.79	10.88	124.91	7.52	6.73	0.78	7.74	4.85
2003	206.00	15.54	190.46	7.12	6.54	0.58	9.67	5.46
All	2,181.79	841.98	1,339.81	98.36	84.66	13.70	183.60	92.08

"PP" denotes private placement; "Unit" offerings are equity offerings with warrants; "Shelf" offerings are pre-registered under SEC Rule 415; "ADR" denotes American depository receipt; and "Reg-144a" denotes private placement to a qualifying investor under SEC regulation 144a.

- ADRs have a relatively larger average size of $203 million, compared to SEO average proceeds of $86 million.

Figure 1 and Figure 2 show the distribution of total issue proceeds across three categories of issuers: industrial firms, banks and financial institutions, and public utilities.[13] Industrial firms are by far the dominant issuers of SEOs throughout the entire 24-year period (Figure 1). Banks and financial institutions are a distant second, with utilities are a very distant third. Both industrial firms and banks/financial institutions have substantially greater total issue proceeds in the second half of the sample period.

On the debt side, banks and other financial institutions greatly dominate the amount raised from public offerings of straight debt (part (a) of Figure 2). Here industrial firms and utilities are a distant second and third. For private placements of debt, however, industrial issuers dominate, with banks and financial institutions a close second. As with equity issues, the proceeds from both public and private debt issues are substantially greater in the second half of the sample period.

2.3.2. Time from IPO to follow-on offerings

The need for new capital is undoubtedly a key motivation to go public for many private companies. The immediate need for capital is covered by the proceeds from the IPO—but, equally important, a public company subsequently has better access to the capital markets. This section reviews evidence on how rapidly new public companies in fact do come back to the market with a follow-on offering.

[13] Notice the different scales across the vertical axis of the three figures.

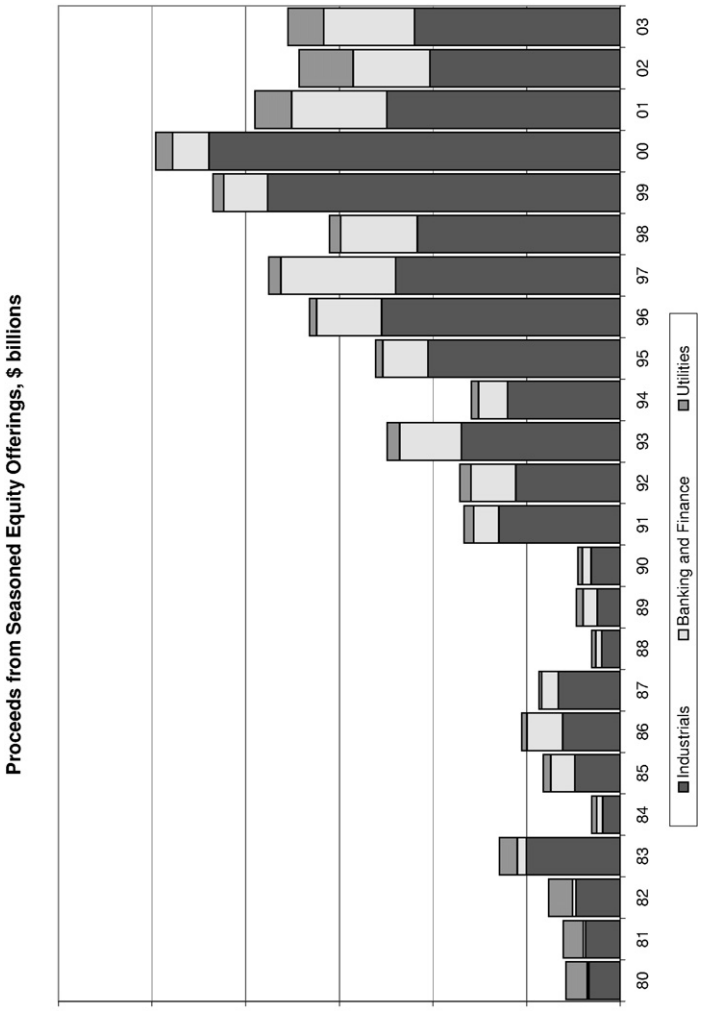


Fig. 1. Annual distribution of total issue proceeds in 11,151 SEOs by U.S. issuers, classified by whether the issuer is an Industrial Company, a Bank or Financial Institution, or a Public Utility, 1980–2003.

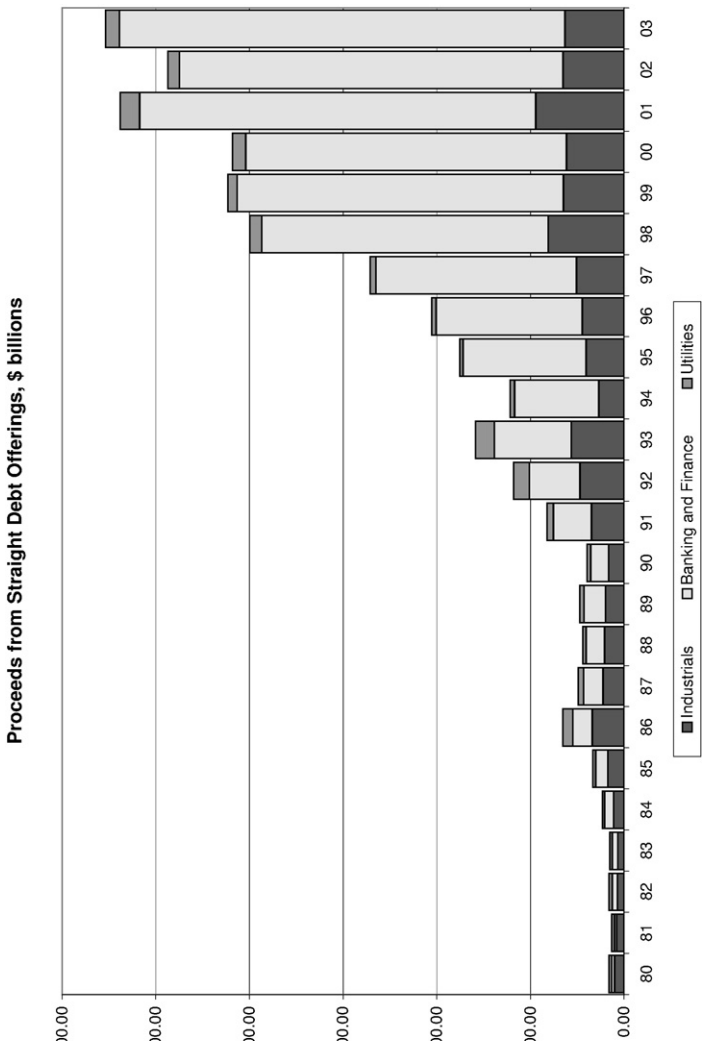
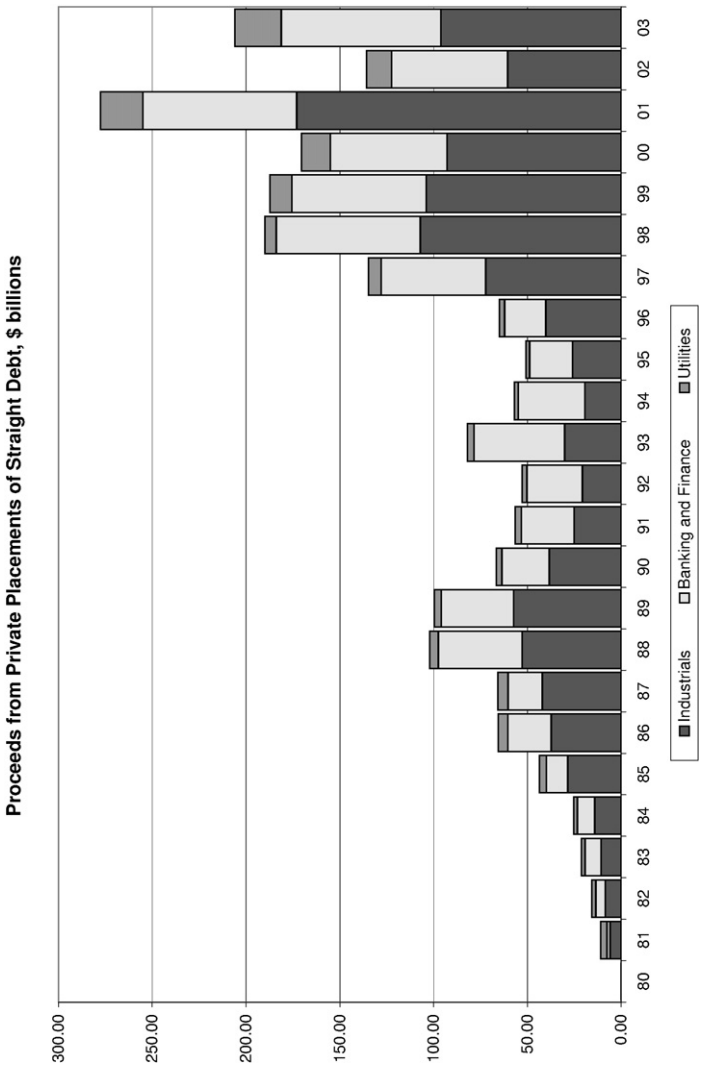


Fig. 2. Annual distribution of total issue proceeds in 37,398 public and 17,948 private issues of straight debt by U.S. companies, classified by whether the issuer is an Industrial Company, a Bank or Financial Institution, or a Public Utility, 1980–2003.



(b)

Fig. 2. (*Continued*)

Table 5
Time between an IPO and follow-on offerings, conditional on observing at least one follow-on offering, classified by security type, 1980–2000

	N	Mean	Std. Dev.	Min	Max
A. First post-IPO issue regardless of security type					
Seasoned equity offerings	1724	2.31	2.50	0.18	15.26
Private placement of equity	119	2.81	2.30	0.00	11.60
Preferred equity	61	2.64	2.61	0.07	10.98
Convertible debt	129	1.95	1.98	0.21	12.21
Private placement of debt	353	2.52	2.62	0.01	13.86
Straight debt	124	2.27	2.41	0.00	12.47
Overall	2531	2.35	2.51	0.00	16.44
B. First post-IPO issue conditional on security type					
Seasoned equity offerings	2665	3.30	3.26	0.13	19.70
Private placement of equity	214	3.80	3.11	0.00	18.70
Preferred equity	142	4.22	3.33	0.07	13.40
Convertible debt	315	3.62	3.15	0.21	15.58
Private placement of debt	1230	4.49	3.60	0.01	18.26
Straight debt	514	5.28	4.05	0.00	18.02

Source: Eckbo and Norli (2006). The table reports the number of calendar days between a firm's IPO date and the date of subsequent security offerings. The restriction that there must be at least one follow-on offering before 12/2000 (regardless of security type) restricts the sample from 6,092 to 2,531 IPOs. Panel A lists the time between the IPO and the first follow-on issue regardless of the type of security issued. Panel B shows the time between the IPO date and the date of the follow-on issue given that the security is of the type listed in the panel. N is the number of security offerings after the IPO. For example, Panel B shows that there are a total of $N = 2{,}665$ (or 28%) SEOs following the 6,092 IPOs over the sample period.

Table 5, which appears in Eckbo and Norli (2006), shows descriptive statistics for follow-on security offerings made by 6,092 firms that went public during the period 1980–2000. A total of 3,579 firms (approximately 59%) do *no* follow-on offering during the sample period. Since firms going public in the last part of the sample period would have little time to do a follow-on offering, this number overstates the true fraction of non-follow-on firms. However, restricting the sample to the 3,750 IPOs that were completed in the period 1980–1993, which insures a minimum seven-year post-IPO period, a total of 1,977 firms (53%) did no follow-on offering during the interval 1980–2000. Overall, it appears that only one of two firms undertaking an IPO comes back to raise capital externally through a public security offering.[14]

[14] Firms that delist in the first few years after their IPO are even less likely to have any follow-on offerings. See Fama and French (2004) for information on survival frequencies in the population of listed firms. Eckbo and Norli (2005) show that delistings of IPO firms due to either acquisitions or bankruptcies in the first five years after the IPO is indistinguishable from the delisting frequency of seasoned firms matched on size and book-to-market ratio.

Panel A of Table 5 reports the average number of years between the IPO offer date and the first post-IPO security offering. In the sample of 6,092 IPOs, there are 1,724 firms that follow the IPO with a SEO as the first post-IPO security offering. The average number of years between the IPO and the SEO is 2.31 years. Panel A also shows that the SEO is the most common type of security offering to be made after the IPO. The second most common "first post-IPO offering" is a private placement of debt: 353 firms follow the IPO with this type of security.

The time from the IPO to the first security offering varies little across security types. The average time between the IPO and the follow-on security offering ranges from 1.95 years for convertible debt to 2.81 years for private placement of equity. Excluding convertible debt, the remaining five securities are offered on average between 2.27 and 2.81 years after the IPO. As suggested by Eckbo and Norli (2006), it appears that it takes on average 2.35 years to burn through the IPO proceeds, after which time companies may be selecting the security offering that minimizes issue costs.

Panel B of Table 5 reports the average number of years between the IPO and the first offering of security type j—regardless of whether or not security offering j is the first to follow the IPO. Again, conditional on observing an IPO during the sample period, the most frequent security offering in our sample is SEOs. However, it is clear that if one does not condition on observing an IPO, the most common security offered is debt. As expected, the average number of years from the IPO to a specific security offering is longer than in Panel A of Table 5. The reason is that in Panel A each offering is required to be the first offering after the IPO. Panel B shows that following an equity IPO a convertible debt offering typically occurs sooner than a straight debt offering.

The finding that only one in two firms undertake a follow-on offerings is interesting. Although private firms almost certainly go public partly to get access to public security markets, external security issues (for cash) may be costly relative to internal financing. As discussed in Myers and Majluf (1984) and in Section 4 below, information asymmetries between the issuer and investors purchasing the issue may give rise to issue costs. These issue costs are found to be roughly proportional to the ex ante risk that an issue is overpriced, which leads Myers and Majluf (1984) to propose a financing pecking order. Internal equity (retained earnings) tops the pecking order, followed by debt securities and, finally, by external equity issues.

As surveyed by Frank and Goyal (2007), one prediction of the pecking order model is that debt ratios should be driven by the need for external funds. For example, the debt ratio should increase when firms experience a "financing deficit" (when retained earnings are insufficient to cover investment outlays). Shyam-Sunder and Myers (1999) find evidence consistent with this prediction. However, Frank and Goyal (2003) and Fama and French (2005) reach a different conclusion. Using a different sample than Shyam-Sunder and Myers (1999), Frank and Goyal (2003) find instead that net equity issues track financing deficits more closely than do net debt issues. Fama and French (2005) construct a measure of equity issues that includes any transaction that increases the split-adjusted number of shares outstanding. In addition to public equity offers for cash, such transactions include stock issues to employees, stock financed mergers, and

rights offerings and direct purchase plans. Fama and French (2005) document that under their measure of equity issues, equity offerings are commonplace. For the three ten-year periods between 1973–2002 the authors find that 54%, 62%, and 72% of sample firms make net equity issues *every year*. They interpret this finding as a violation of the pecking order theory.

However, it is not clear that the evidence in Fama and French (2005), or studies of the Shyam-Sunder and Myers (1999) type of financing deficit, have the requisite power to reject the (basic) pecking order theory. Recall that this theory requires asymmetric information between the issuer and the investor purchasing the issue. A large proportion of the equity issues identified by Fama and French (2005) are stock swaps in mergers and acquisitions as well as stocks issued as part of employee compensation plans. It is difficult to imagine that stocks issued to CEOs give rise to adverse selection costs. Moreover, the ample opportunities for information exchange during merger negotiations also reduce adverse selection costs driven by information asymmetries. Also, given the *two-sided* information asymmetry associated with a stock exchange merger (the true value of the target shares is unknown to the bidder and vice versa), there is theoretical support for the proposition that the bidder prefers equity over cash or debt as the form of payment (see Eckbo, Giammarino, and Heinkel (1990) and the survey by Betton, Eckbo, and Thorburn (2007)). In sum, absent the requisite one-sided information asymmetry depicted in the original paper of Myers and Majluf (1984), evidence on the frequency of equity issues per se may have little power to test the pecking order. Of course, an equity issue for cash *does* satisfy this particular information asymmetry requirement since the value of cash is known to both sides of the transaction. As shown by Eckbo and Norli (2006) (Table 5 above), external equity issues for cash are indeed rare. This is consistent with the presence of external financing costs emanating from asymmetric information—as emphasized under the pecking order theory.

3. Flotation costs

To the extent that corporations choose among alternative financing methods so as to maximize the expected net proceeds of security offerings, flotation costs can have a large bearing on the choices an issuer makes. Broadly speaking, expected flotation costs includes components such as the expected issue announcement effect, expected underpricing, underwriter spread, expected out of pocket expenses, the probability of offer cancellation multiplied by the expected cost of cancellation,[15] and any short term incremental costs or benefits (if any) of moving away or towards a firm's target leverage ratio.

There is some disagreement on whether a security announcement is an expected flotation cost. Some researchers argue that a security offering announcement effect simply

[15] The expected cost of offer cancellation includes the loss of out of pocket expenses, management time and the expected opportunity costs of forgoing profitable investment projects if the offering isn't resurrected later.

conveys negative information about the issuing firm that managers alway knew, which would become public at some future date anyway, so why should it represent an issue cost? In contrast, other researchers view this announcement effect as capitalizing the direct and indirect effects of raising new equity capital, including empire building. At this point, we don't have resolution on this question. However, what we do know is that the typical negative announcement effect represents an expected permanent drop in the issue price. Furthermore, we view the early revelation of negative information about the issuer as an expected issue cost as well, as would any shareholder selling in the secondary market thereafter and as would any blockholder selling shares in a secondary offering. Evidence about security offering announcement effects is discussed extensively in Section 4, below.

While expected flotation costs tend not to change much over short time periods, market conditions and the firm's financial condition as well as the quality of publicly available information about the firm are all likely to vary substantially over longer periods of time (several years). For example, there are distinct differences in the level of underpricing needed to float a security issue and sizable differences in the likelihood of offer cancellation, both of which depend on current market conditions. Furthermore, our sample period has witnessed significant changes in securities regulations (such as shelf registration) and the competitive structure of the underwriting market—with the entry of commercial banks, investment banking industry consolidation and the increased internationalization of the security offering process—which can alter the level of underwriter competition and the pricing of their services.

Expected flotation costs also vary across firms at any point in time, depending of the characteristics of the issuers and the security offering. Thus, knowing these characteristics allows us to better forecast the expected flotation costs an issuer will bear from making a particular security offering. In the discussion to follow, we examine the existing evidence on the determinants of several of the flotation cost components.

3.1. Total flotation costs

Flotation costs are made up of direct costs and indirect cost of selling a security through a public offering, where the direct costs include underwriter compensation, registration and listing fees, legal, accounting and printing expenses, etc. Underwriter compensation is made up of several components, the most important being the underwriter's gross spread or the difference between the public offering price and the underwriter purchase price. The other components of underwriter compensation include: an over-allotment option (typically this is a one month warrant to purchase an additional 15 percent of shares at the same price as the offering itself), plus long term warrants exercisable at the offer price, and extra reimbursements of underwriter expenses by the issuer.

Security sales also involve indirect flotation costs. The most important indirect cost is the typical underpricing costs associated with selling a security at a discount relative to both its prior trading day's closing price and its closing market price immediately following the public offering. Since an underwriter can allocate the issue, it is possible

for an underwriter to capture much of the value associated with security offer underpricing. The effect of a security issue announcement on its offering price and the expected cost of a security issue delay or withdrawal are also potentially important indirect costs, which are discussed below. Finally, management time and energy devoted to the offering process is yet another significant, but hard to quantify indirect cost.

To summarize, expected flotation costs can be separated into direct and indirect cost components. Direct flotation costs are composed of:

- Fees to underwriters (including warrants and over-allotment options).
- Other out of pocket expenses, which include fees to accountants, law firms, listing fees, registration fees, printing, advertising as well as *road show* expenses and the cost of management time.

Indirect flotation costs include

- Issue underpricing, which can potentially be captured by underwriters through their power to allocate the issue to preferred customers and affiliates.
- Stock price reactions to initial offering announcements, which on average are negative, and any follow up announcements concerning changes in offer size and other characteristics.
- Costs of offering delays/cancellations.

Most of the extant literature focuses on the size and determinants of underwriting discounts (or fees) and security offering underpricing of equity offerings.

Early research on SEO flotation costs was conducted by the SEC staff in a series of studies and later by Smith (1977), who examined mean underwriter fees and other expenses. These two direct flotation cost components were examined across issue size categories and three major flotation methods. Flotation costs as a percent of gross proceeds were observed to fall with a rise in issue size. In addition, these costs were found to vary with flotation method for comparable size offers; more specifically, underwriter fees and other expenses were largest for firm commitments and cheapest for rights offers. Smith raised the question of why most U.S. firms appear to choose the highest cost flotation method and explored a number of possible added costs and benefits associated with each of these flotation methods. He was unable to explain away the puzzle. The question of whether there is a comparative advantage for alternative flotation methods was first raised by Hansen and Pinkerton (1982). A complication in undertaking this analysis is that the flotation method is an endogenous issuer decision, which could produce selection biases across the samples. These issues were more extensively studied by Eckbo and Masulis (1992) who re-examine the question of whether issuing firms fail to choose the flotation method that maximizes the net proceeds from their security sales. They uncover evidence consistent with the hypothesis that firms' choices do maximize net proceeds (further details on this issue are given in Section 4 below).

The issuer type and the flotation method choice generally affect both direct and indirect flotation costs of a particular security offering. As summarized in Table 6, in their sample of 1,249 SEOs over the period 1963–1981, Eckbo and Masulis (1992) report that the average direct cost of uninsured rights as a percent of total issue

Table 6
Total direct issue costs for U.S. issuers of seasoned equity, classified by issuer type and flotation method

	Firm commitments		Standby rights		Uninsured rights	
Flotation costs	Ind	Utl	Ind	Utl	Ind	Utl
Number of observations	351	639	42	89	26	23
Underwriter compensation ($ millions)	47 (1.03)	1.78 (1.32)	1.20 (0.47)	0.56 (0.34)	–	–
Other expenses ($ millions)	0.16 (0.15)	0.14 (0.12)	0.36 (0.19)	0.38 (0.29)	0.11 (0.09)	0.45 (0.19)
Total costs ($ millions)	1.72 (1.28)	1.92 (1.45)	1.59 (0.68)	0.94 (0.72)	0.11 (0.09)	0.45 (0.19)
Total costs/ gross proceeds (%)	6.09 (5.53)	4.23 (3.82)	4.03 (3.32)	2.44 (2.07)	1.82 (0.94)	0.51 (0.22)
Total costs/ market value common (%)	1.05 (0.68)	0.49 (0.41)	0.93 (0.57)	0.22 (0.18)	0.80 (0.30)	0.05 (0.02)

Source: Eckbo and Masulis (1992). The sample size is 1,249 SEOs and the sample period 1963–1981. "Ind" denotes industrial issues and "Utl" denotes public utility. Data sources in the original study are the SEC Registered Offerings Statistics data tape and issue prospectuses. The cost of the offer price discount in firm commitment offers is not included, nor is the value of any "Green Shoe" options. In the standby rights category, the underwriter's compensation is computed using the actual takeup fee based on subscription information.

proceeds is 1.82% for industrial issuer and 0.51% utility issuers. Despite a subscription rate that typically exceeds 70% (Hansen and Pinkerton, 1982; Eckbo and Masulis, 1992; Singh, 1997), the cost of standbys average as much as 4.03% of gross proceeds for industrials and 2.44% for utilities. Firm commitment offerings are the most expensive with average direct costs of 6.09% and 4.23% for industrial and utility issuers, respectively. Smith (1977), Hansen (1988) and Singh (1997) also presents costs of standby rights offerings consistent with those in Table 6. Furthermore, the low-cost status of uninsured rights holds internationally as well (e.g., Bøhren, Eckbo, and Michalsen, 1997; Slovin, Sushka, and Lai, 2000; Gajewski and Ginglinger, 2002).

Eckbo and Masulis (1992) also report that the average underpricing of SEOs in their firm commitment sample is very close to zero over their sample period (typically, the issue was offered at the previous closing price). As discussed below, this has since changed: it is now common to underprice a firm commitment SEO. Since current shareholders in a rights offer capture the value of underpricing through the value of the right, the development of underpricing in firm commitment SEOs further exacerbatesthe direct-cost disadvantage of this flotation method. It is clear that rights have lowest

direct costs, while commitments is a firm's most expensive method, with standby rights in between.

Keep in mind that when comparing the costs of alternative flotation methods, one must control for firms' self-selection of the issue method. For example, as Hansen and Pinkerton (1982) point out, it is possible that observed flotation costs of uninsured rights are particularly low because this method is selected when a large blockholder is willing to guarantee subscription (which is typically the case). It is also possible that firms tend to select uninsured rights more generally when shareholder concentration is high, and when stock return variance is low. The point is that these and other characteristics can reduce direct flotation costs regardless of the chosen flotation method. To control for this effect, Eckbo and Masulis (1992) pool all flotation methods and use indicator variables for standbys and firm commitment issues in their cross-sectional regressions with direct issue costs as dependent variable. Conditional on various firm- and issue-specific factors, they conclude that the choice of an underwritten offer (standby or firm commitment) increases the flotation costs over and above uninsured rights, and that the choice of a firm commitment offer increases these costs further.

Lee et al. (1996) study direct flotation costs (underwriting spreads and other direct expenses as a percentage of offer gross proceeds) of IPOs, SEOs and issues of convertible and straight corporate debt over the 1990–1994 sample period. They find that the total direct issue costs are 11 percent for IPOs, 7.1 percent for SEOs, 3.8 percent for convertible debt and 2.2 percent for straight debt. They also document the frequency of issues with global tranches and over-allotment options. While debt offering flotation costs are low, it is important to keep in mind that debt issues, have a finite life of generally less than 10 years duration, especially taking into account sinking funds and callability. Thus, for a firm to have long term access to this debt capital, it is necessary to periodically refinance these debt issues, which involves repeated rounds of future flotation costs.

Public offering of debt can at times precede an IPO of stock, a phenomenon studied by Datta, Iskandar-Datta, and Patel (1997) and Cai, Ramchand, and Warga (2004). Firms issuing public debt are required to meet the SEC mandated financial disclosure requirements of public companies. Cai, Ramchand, and Warga (2004) report that subsequent IPOs by these firms are associated with significantly lower underpricing and lower price revisions from the midpoint of the filing range to the offer price. However, the lower underpricing is restricted to subsequent IPOs that have rated public debt, which tend to be financially stronger issuers. Also, public debt issues can be simultaneously offered with public equity issues, which is a financing decision studied by Hovakimian, Hovakimian, and Tehranian (2004).

3.2. Underwriter compensation

Underwriter compensation is made up of three parts: management fees paid to the syndicate's lead underwriter or book runner, underwriting fees paid to the underwriters,

and selling concessions to the syndicate members selling the shares to institutional and retail customers. In this literature, spreads are almost always measured as a percentage of offering size or gross proceeds. Most studies focus on either underwriter gross spread or underpricing costs, while very few studies estimate both the direct and indirect flotation costs of security offerings. Most studies also limit themselves to studying one security class, with SEOs being the most intensively examined offering type.

Moreover, most existing research on flotation costs focuses on the experiences of U.S. companies, primarily issuing common stock listed on major U.S. stock exchanges. Over the last 20 years, nearly all security offerings sold in the U.S. have relied on a firm commitment underwriting contract and a large majority of existing studies restrict their investigations to this sample. Most of these studies also limit their analysis to unregulated industrial firms. Since many of these studies also require the availability of machine readable accounting data, typically extracted from Compustat, the samples are further reduced by excluding many smaller firms not covered in this financial accounting database.

Kim, Palia, and Saunders (2005a) report underwriting spreads of industrial issues for SEOs, IPOs and straight corporate debt issues over the 1970–2000 period. They find that for the last three decades (i.e., 1970s, 1980s and 1990s) average underwriting spreads have fallen from 5.6 percent to 4.7 percent for SEOs, and from 7.7 percent to 6.7 percent for IPOs, with increased clustering of SEO spreads at 5 percent and IPO spreads at 7 percent. Similarly, average underwriting spreads have dropped in half from 1.6 percent to 0.8 percent for debt issues.

A consistent result found in the security offering literature is that underwriting spread rises with a security's total risk measured by return standard deviation over a pre-offering (SEOs) or post-offering (IPOs) estimation period. First, underwriting spreads are substantially larger for IPOs than SEOs, larger for SEOs than convertibles debt offers and smallest for straight debt offers. The average total risk (stock return standard deviation) of these classes of securities can likewise be ranked from highest to lowest. The rankings of total risk across security classes mirror those for security underwriter spreads: Total risk is on average highest for IPOs, followed by SEOs, then convertible debt and finally is smallest for straight debt. Within each of these security classes, there is also evidence that underwriter spreads are directly related to a security's return standard deviation.

The second major characteristic of security offerings found to reduce spreads is the offering size and this has been interpreted as an underwriting economy of scale effect due to the presence of large fixed costs, which exhibits increasing returns to scale. However, Altinkilic and Hansen (2000) takes issue with this interpretation. They point out that the observed fees do not fall steeply enough if they consist mostly of fixed costs. Thus, they argue that most of the fee is a variable cost, rather than a fixed cost. Offering size is also often measured as a percent of equity capitalization where it is interpreted as capturing an adverse selection effect.

A third very common characteristic used as a control variable is a measure of firm size, usually measured by firm book value of assets, market value of assets, equity market value (measured by book market value or debt plus equity market value), or firm annual sales. Firm size is generally interpreted as capturing asset diversification and the quality of publicly available information about the firm. These three characteristics are frequently used as control variables in this stream of literature examining underwriter spreads.

Two well cited studies of IPO underwriting spreads Chen and Ritter (2000) and Hansen (2001) document that these spreads strongly cluster at 7 percent, especially in the 1990s. However, in selecting their sample, Chen and Ritter exclude very large and very small issues where other levels of underwriting fees would most likely be observed. They interpret this as evidence that the market for underwriting services is oligopolistic. Hansen (2001) re-examines IPO underpricing without excluding relatively large and small issues and finds much greater variability in underwriting spreads. He also presents other evidence supporting the existence of a competitive underwriting market. More recently, Mullineaux and Roten (2005) compare IPO underwriting spreads by commercial banks and investment banks and find that commercial bank underwriters tend to be more concentrated at 7% than investment bank underwriters. Kim, Palia, and Saunders (2005b) examine trends in IPO and SEO underwriter spreads over the 1970–2004 period. They find evidence of a fall in IPO spreads over the 1990–2004 period, but no evidence of a change in SEO spreads, which is weak support for an increase in competition in the underwriting market.

In most studies of underwriter spreads, researchers take a particular focus, usually investigating an economic determinant of spreads that is not well documented in the literature, while controlling for other offering characteristics previously shown to affect spreads. For example, Kim, Palia, and Saunders (2005a) jointly study IPO underwriter spreads and underpricing, with particular focus on the interrelationship of underwriter spreads and underpricing. They argue that underpricing can be viewed as an additional form of compensation, which underwriters can capture through their power to allocate offers to favored customers. They find that IPO underwriter spread is positively related to IPO underpricing, a missing financial statement indicator and the inverse of the log of offer size and negatively related to the underwriter having a star analyst and issuer return volatility.

Turning to SEOs, Smith (1977) reports on direct flotation cost components classified by flotation method and offer size and scaled by gross proceeds. He calculates the mean values of both underwriter fees and other expenses across three major flotation methods; namely firm commitments, rights offers and standby offers. Smith finds that underwriter spreads average 5 percent of the offer price for firm commitments and that they range from over 10 percent for small issues to under 4 percent for very large issues.

Eckbo and Masulis (1992) study SEO underwriter spreads and flotation methods for industrials and utility issuers listed on NYSE and AMEX for nearly a 20 year period. They report underwriter fees and other flotation costs by flotation method and confirm

Smith (1977)'s findings that rights and standby offerings are less costly. Estimating determinants of direct flotation costs separately for industrial and utility issuers, they find for industrial issuers that flotation costs are negatively related to gross proceeds and average shareholding value and positively related to gross proceeds squared, return standard deviation, and percent change in shares. They emphasize the importance to flotation method choice of expected shareholder take-up in both rights and standby offers. Their evidence is consistent with the Myers and Majluf (1984) interpretation of the market's negative average announcement price reaction to an SEO as an upward revision in the market's expectation that the security is overvalued. They also find evidence that firms choose the flotation method that maximizes the net proceeds of their security offerings.

Altinkilic and Hansen (2000) study the determinants of underwriter spreads in industrial SEOs. They calculate mean underwriter spreads across offer size ranges and find that average spreads vary from 4.4 percent to 6.3 percent. They estimate the determinants of underwriter spreads as a function of the log of offer size, percent change in shares, return standard deviation and value of all underwritten industrial SEOs in the prior 3 months. They find that spread is significantly negatively related to log of offer size and positively related to percent change in shares, return standard deviation, the value of underwritten industrial SEOs in prior 3 months and the inverse of offer size when it is substituted for the log of offer size. Alternatively, Altinkilic and Hansen replace the log of offer size by the inverse of offer size and use it to estimate the slope of marginal spread. They find that the slope rises with offer size. This supports a rising variable cost of underwriting as offer size expands. Their perspective is that underwriter spreads are U shaped and that larger, less risky issuers have spreads that reach their minimum value at high offer sizes. Hansen (2001) examines whether this U shape spread phenomenon is present in IPO spreads prior to the rise of the 7% contract. He shows that IPO spreads are also consistent with rising variable costs, and are U-shaped. Corroborating evidence from German IPOs and SEOs is reported by Buhner and Kaserer (2002) and Kaserer and Kraft (2003) that marginal spreads are not decreasing in offer size. The Kaserer and Kraft analysis uses an principal components analysis within a generalized weighted least squares framework.

Kim, Palia, and Saunders (2005a) jointly study underwriter spreads and underpricing in SEOs as well as IPOs. They find that underwriter spreads are positively correlated with underpricing costs in SEOs and IPOs. They also investigate whether underwriter spreads are affected by market conditions, underwriter competition and issue characteristics using three stage least squares. They find SEO underwriter spread is positively related to underpricing, issuer leverage, missing financial statements, the inverse of the log of offer size and negatively related to market share of the top 25 underwriters, a top 25 underwriter indicator, indicator for bank entry into the underwriting market, and issuer profitability.

Butler, Grullon, and Weston (2005b) study the importance of SEO liquidity as a determinant of SEO underwriting spreads over the 1993–2000 period. They examine a broad range of liquidity measures including: quoted spread, effective spread, relative

effective spread, quoted depth, trading volume, turnover, trade size, and a liquidity index of the above measures. They report that all the liquidity measures they examine are significant, with bid–ask spreads being positively related and the depth and activity levels being negatively related to underwriter spreads. They control for a broad range of other SEO characteristics and find that underwriting spreads are also negatively related to offer size, equity capitalization, share price, a multiple book manager indicator and positively related to return volatility, and Amex and Nasdaq indicators. In contrast, Altinkilic (2006) examines the role of underwriter market making immediately following SEOs to determine whether market making activities are partially paid by the underwriting spread. She argues that paying for market making in the underwriting spread takes pressure off the bid–ask spread, thus improving secondary market liquidity after the offer. Using abnormal share trading volume in the four weeks following the SEO as a proxy for market making costs, She finds that compensation for market making can explain 20% of the lead underwriter's total compensation, after controlling for other known determinants and that this underwriting fee component rises as the cost of market making rises.

More recently, Lee and Masulis (2006) examines the effect on SEO underwriting fees of financial accounting information quality, using a recent measure of accruals quality developed in the accounting literature by Dechow and Dichev (2002). They report that as the quality of issuer's financial accounting deteriorates, both SEO underwriting spreads, the negative announcement return, and frequency of offer withdrawals rise. They also find that a large number of other control variables are significant including log of net offer proceeds, secondary scale percentage, underwriter rank, log of total assets, stock return standard deviation and indicators for credit rated bonds and shelf offerings.

In another recent study, Drucker and Puri (1989) explore the effects of concurrent and prior lending and prior equity underwriting on the gross spreads of SEO. They find that a concurrent lending relationship, a prior lending relationship, or both, all reduce gross spreads. However, the effect of a concurrent lending relationship is stronger than a past relationship and a combined relationship is greater than a simple concurrent relationship. They also find that a past equity underwriting relationship reduces gross spreads, where they allow for a U-shaped spread following Altinkilic and Hansen (2000). This last result is consistent with several earlier studies of SEO underwriter competition that will be discussed later.

Table 7 summarizes the existing studies of underwriting spreads. The extant evidence shows that SEO underwriter spreads (1) exhibit a scale economy effect with diminishing marginal returns and (2) are negatively related to a firm's size and the offer's size relative to the issuer's equity capitalization. Finally, there is recent evidence that these underwriting spreads are negatively related to a security's liquidity and positively related to the quality of accounting information and existing and prior banking relationships. The evidence summarized in Table 7 is that SEO underwriting spreads are positively related to a firm commitment underwriting contract, percentage change in shares, inverse of offer size, log of offer size squared, underpricing, a missing financial statement indicator, bid–ask spread, prior SEO activity (prior 3 months), Amex and Nasdaq indicators.

Table 7
Evidence on underwriter spreads in IPOs and SEOs

Study	Sample period	Explanatory variable	Sign
A. IPO studies			
Megginson and Weiss (1991)	1983–1987	Venture backing	−
		Log(offer size)	−
		Underwriter market share	−
		Firm age	−
Hansen (2001)	1980–1999	Relative offer size	+
		Stock return standard deviation	+
		Log(offer size)	−
		Secondary offering proportion	−
Kim, Palia, and Saunders (2005a)	1970–2000	Underpricing estimate	+
		Missing financial statement (2 years)	+
		Inverse log(issue size)	+
		Stock return standard deviation	+
		Lead underwriter's market share	−
		Underwriter with All-Star analyst	−
B. SEO studies			
Smith (1977)	1971–1975	Firm commitment indicator	+
		Offer size classes	−
Hansen and Torregrosa (1992)	1978–1986	Stock return residual st. error	+
		Offer size	+
		Log(offer size)	−
		Log(equity market value)	−
		Log(% manager shareholdings)	−
		Syndicate manager portion of offer	−
Bhagat, Marr, and Thompson (1985)	1982–1983	Stock return residual variance	+
		Log(offer size)	−
		Stock beta	−
		Utility firms	−
		Shelf registrations	−
Eckbo and Masulis (1992)	1963–1981	Increased shares outstanding (%)	+
		Stock return standard deviation	+
		Log(offer size) squared	+
		Log(offer size)	−
		Ave shareholdings value	−
Denis (1993)	1982–1985	Log(offer size) ∗ shelf offer	+
		Shelf issuer ∗ log(offer size)	+
		Stock return variance (adjusted)	+
		Log(offer size)	−
		Shelf offer	−
		Shelf issuer	−
Altinkilic and Hansen (2000)	1990–1997	Increase in shares outstanding (%)	+
		Stock return variance	+

(*Continued on next page*)

Table 7
(*Continued*)

Study	Sample period	Explanatory variable	Sign
		Recent SEO activity (prior 3 months)	+
		Inverse of offer size (offer size)	+
Kim, Palia, and Saunders (2005a)	1970–2000	Underpricing estimate	+
		Missed financial statement	+
		Lead underwriter not in top 25	+
		Issuer leverage	+
		Stock return standard deviation	+
		Over-allotment option used	+
		Inverse log(offer size)	+
		Market cap ∗ Inverse log(offer size)	−
		Herfindahl index in I-banking	−
		Lead underwriters market share	−
		Commercial bank market entry	−
		Issuer profitability	−
Butler, Grullon, and Weston (2005a)	1993–2000	Bid–ask spread (%)	+
		Log(stock return standard deviation)	+
		Amex indicator	+
		Nasdax indicator	+
		Quoted depth	−
		Trading volume	−
		Issuer share turnover	−
		Log(offer size)	−
		Log(equity capitalization)	−
		Log(share offer price)	−
		Multiple syndicate book managers	−
Lee and Masulis (2006)	1991–2002	Poor accrual quality	+
		Stock return standard deviation	+
		Relative offer size	+
		Shelf offering	−
		Log(offer size)	−
		Underwriter market share	−
		Log(total assets)	−
Drucker and Puri (1989)	1996–2001	Inverse of offer size	+
		Stock return standard deviation	+
		Concurrent lending	−
		Concurrent and prior lending	−
		Prior lending	−
		Prior equity underwriter	−
		SEO market activity	−

At the same time, SEO underwriting spreads are negatively related to offer size, issuer profitability, market depth, equity capitalization, share price, average shareholding value, market share of top 25 underwriter, commercial bank entry in the underwriting market, and multiple book managers.

3.3. Underpricing of SEOs

Underpricing is typically the most important indirect flotation costs in a security offering. There are several ways to measure underpricing of security issues. The offer price can be compared to the closing price, bid, ask or midpoint on the prior trading day or the first trade day following SEO completion. The offer price relative to the closing price on the offer date is generally termed the underpricing level. Researchers have also examined the offer price relative to the prior day's high and low prices.

We will focus most of our attention on recent empirical developments in IPO and SEO underpricing. Ljungqvist (2007) provides an excellent review of the theory and evidence on IPO underpricing elsewhere in this book. He concludes that much of the underpricing effect can be explained by information frictions including the Benveniste and Spindt (1989) theory that underwriters reward investors for information on issue demand through underpricing, as well as underwriter certification and various agency theory models which explore the conflict between IPO investors and issuer/management.

In a recent IPO study, Li and Masulis (2006) explore the effects of pre-IPO equity investments by major financial institutions including commercial banks, investment banks, venture capitalists and insurance companies, controlling for whether these financial institutions are also lenders to the firm or underwriters in its IPO. They examine these venture investment effects on IPO underpricing, offer price revisions from the filing range, post-IPO long run performance. Li and Masulis also employ a large number of other control variables used in earlier studies. They find evidence consistent with financial institution certification through venture investment, that is associated with lower IPO underpricing and offer price revisions and better long run performance. They also find that there are incremental certification effects as additional classes of financial institutions invest in these issuers. These results are robust to controlling for several forms of endogeneity. They also report that the coverage of pre-IPO loans is more completely reported in offering prospectuses than in the Dealscan loan database.

In another recent IPO study, Edelen and Kadlec (2005) develop a model of underpricing based on the probability of offer withdrawal and the importance of a successful offering. In essence, when the firm's stock price is rising before the offer day, managers are more willing to increase IPO underpricing to enhance the likelihood of a successful offering. Their model can explain why there is partial adjustment to public information released between the filing date and the offering date and it takes into account public information spillovers from the issuers industry. They report that their model can explain a large portion of the cross sectional dispersion in IPO underpricing and can explain hot issues markets. In their analysis, they use Heckman (1979)'s two step procedure where in the first step they estimate the probability of offer withdrawal and then in the second step they estimate the determinants of underpricing. They find that the estimated probability of an offer withdrawal has a significant negative effect on IPO underpricing. Their model also predicts an inverse relation between withdrawal frequency and industry stock returns between the filing and withdrawal dates. They argue that the asymmetric partial adjustment effect to industry information spillover effects found in

earlier studies is due to a truncation regression bias and that once the withdrawal probability is taken into account this information spillover effect becomes symmetric.

Turning to SEO underpricing, Eckbo and Masulis (1992) examine mean and median underpricing by flotation methods for utility and industrial issues of NYSE and AMEX listed firms over the 1963–1981 period. They find that offer prices for firm commitments of industrial and utility issuers were on average underpriced by less than a half percent (i.e., 0.44 percent). Altinkilic and Hansen (2003) and Corwin (2003) investigate SEO underpricing of NYSE and Nasdaq listed stocks in more recent periods. Looking at mean underpricing by year, they find that it increases substantially in the 1990s relative to the 1980s. For example, Corwin (2003) reports that in the 1980s, it averaged 1.30 percent, while in the 1990s it averaged 2.92 percent. He observes that the rise in average underpricing of SEOs could be due in part to the large increase in the proportion of Nasdaq issuers, which in the 1990s were very young and with their asset values comprised mainly of risky intellectual property and growth options. However, a full explanation for SEO underpricing as well as its recent rise is still lacking.

Safieddine and Wilhelm (1996) analyzes the relationship of SEO underpricing to short selling. They examine offer date returns for industrials and utilities issuers with and without option trading and relate it to short interests in their stocks. They examine this activity before and after the enactment of Rule 10b-21, which prohibited using shares purchased at the offering price to close out short positions opened after the offering registration statement is filled. In this study, offering day returns are measured relative to the high and low prices on the day prior to the offer and the offer day. They report that underpricing is significantly negatively related to underwriter rank and a utility indicator and significantly positively related to abnormal short interest pre-Rule 10b-21 and an option trading indicator in the Rule 10b-21 period. They conclude that SEO offer dates exhibit abnormally high levels of short interest and option open interests and that SEO price discounts are positively related to these higher levels of short interest and option open interest. They also conclude that Rule 10b-21 appears to have curbed short selling activities and reduced underpricing, though Rule 10b-21 was implemented only three years earlier.

Kim and Shin (2004) re-examines the effects of short selling on underpricing using a longer and more recent sample period. They find that offer discounts are negatively related to underwriter rank and positively related to the Rule 10b-21 indicator, underwriter spread, and return volatility. Kim and Shin conclude that the SEC Rule was a partial cause for the temporal increased underpricing of NYSE listed stocks between the 1980s and 1990s, which runs counter to the conclusions of Safieddine and Wilhelm (1996). One serious concern with their study is that both underwriter rank and underwriter spreads are endogenously determined. Whether or not these results will hold up to taking this endogeneity in account is an open question.

Corwin (2003) reexamine the effect of Rule 10b-21 on underpricing using a model that excludes both underwriter rank and spread as regressors and draws a similar conclusion to Kim and Shin (2004). In his study, SEO underpricing is investigated for NYSE and Nasdaq listed stocks, with special emphasis on the differing market microstruc-

ture characteristics in the two marketplaces. He reports that underpricing is positively related to return standard deviation, average IPO underpricing in the month of SEO, relative offer size interacted with quartile indicators for the lowest stock prices and the highest stock return volatility and bid–ask spreads, and indicators for a negative 5 day pre-offer CAR, a tick size less than 0.25, and the Rule 10b-21 period. He also finds underpricing is negatively related to the closing price on day -1 and its interaction with offer price tick size less than 0.25, an NYSE indicator and the interaction of the negative 5 day pre-offer CAR indicator with the Rule 10b-21 period indicator. The negative NYSE indicator is consistent with the findings of Altinkilic and Hansen (2003) of greater underpricing for Nasdaq issues.

When Corwin estimates this model with Nasdaq quote data and adds several market microstructure variables, he finds similar findings, except that Nasdaq underpricing is also positively related to underwriter spread. He concludes that these changes can be explained by a variety of hypotheses related to asymmetric information (return standard deviation), temporary price pressure combined with inelastic demand relative offer size), short selling and manipulative trading (negative pre-offer CAR and Rule 10b-21 indicator), the informativeness of closing prices on the two exchanges (NYSE indicator), differences in underwriter pricing practices on these two exchanges (pre-offer price) and changes in the economics of the underwriting business (average IPO underpricing).

Kim, Palia, and Saunders (2005a) empirically examine the relationship between IPO and SEO underpricing and underwriter spreads. They find that underpricing is positively related to estimated underwriter spread. They also find that underpricing is positively related to the inverse log of issue size (consistent with Altinkilic and Hansen, 2003), the period with commercial bank underwriting and a prior 15 day momentum measure. They find SEO underpricing is negatively related to the market share of the top 25 underwriters, an indicator of a non top 25 lead underwriter and issuer equity market capitalization interacted with the inverse log of issue size. Their empirical analysis is based on a three-stage least squares model of underpricing and underwriter spread.

Evidence in several studies raises questions about the accuracy of the two benchmark prices used to measure underpricing, i.e., the offering day closing price and previous day's closing price. First, Altinkilic and Hansen (2006) report abnormal negative returns over the week prior to the SEO and abnormally high returns over the week following the SEO. Third, we know that underwriters can short sell shares of SEOs prior to the offering date and hedge them against their over-allotment options. Second, following an offering, stabilization activities can bias closing prices, cushioning price drops below the offer price for up to a month thereafter, though a couple of weeks or less is more common. Cotter, Chen, and Kao (2004) report price stabilization for SEOs is negatively related to offer price, trading volume, return variance and positively related to the interval between the filing and offer date. In addition, by looking at only completed SEOs, there can be some added selection bias where less favorably received offers are cancelled or delayed.

Of course accurate determination of the timing of an offering is critical to measure its price reactions, and Brown and Warner (1985) estimate the attenuation effect on measured market price reactions from inaccurate announcement dates. Another problem is that Lease, Masulis, and Page (1991) found a substantial proportion of SEOs are sold after the close of trading, rather than before the open, which is the more common occurrence. They used the Dow Jones time stamps to determine the actual time of day when the SEO is sold. Safieddine and Wilhelm (1996) use abnormal trading volume to determine the time of day when the SEO is sold and argue that this is more accurate approach. They also report a significant number of offers occurring after the market close.

A number of studies have investigated whether SEO underpricing is evidence of price pressure or a downward sloping demand curve. These studies include: Kadlec, Loderer, and Sheehan (1994), Corwin (2003), Meidan (2004) and Altinkilic and Hansen (2006). They report mixed results as to whether there is a downward sloping demand curve effect, short lived price pressure effect or adverse information effect similar to the observed effect of block trades. Kadlec, Loderer and Sheehan reports that in the months immediately surrounding an SEO there is evidence of a temporary stock price decline. Corwin (2003) finds SEO underpricing is positively related to relative offer size and interprets this as support for a price pressure effect. Meidan (2004) reports significant negative returns immediately before an SEO and significant positive returns immediately afterwards, which supports a price pressure effect. Altinkilic and Hansen (2003) report an unusually large negative mean return of -2.6 percent over the week prior to an SEO, followed by a small positive return in the week following the SEO, which is inconsistent with simple price pressure effect.

Table 8 provides a detailed summary of the empirical evidence from prior empirical studies on the determinants of underpricing of IPOs and SEOs. In light of the large number of explanatory variables studied, Table 9 provides a summary of these for easy reference. For the most part, the studies in this area report qualitatively consistent results for their effects on underpricing. Underpricing is found to be significantly related to (1) firm characteristics such firm size, financial condition, industry and share ownership structure, (2) security characteristics such as exchange listing, listed stock options, security volatility and market microstructure properties, and (3) offering characteristics such as offer size, offer price, underwriting syndicate, capital market conditions, other flotation costs and the likelihood of offer withdrawal.

Interestingly, venture capital backing, underwriter rank, and lead underwriter not in the top 25 are all often found to be significant, but with differing signs across the studies. This could reflect the endogeneity associated with the later two variables and underpricing. The varying sign of venture capital backing on underpricing is consistent with Habib and Ljungqvist (2001) who argue that the incentive to avoid underpricing an IPO will vary with the relative size of the primary and secondary shares that are offered. Thus, from this perspective it is important to model not only an indicator for venture backing, but also the size of venture shareholdings and whether these shares are being sold.

Table 8
Evidence on underpricing in IPOs and SEOs

Study	Sample period	Explanatory variable	Sign
A. IPO studies			
Megginson and Weiss (1991)	1983–1987	Venture capital backing	−
		Underwriter rank (market share)	−
		Firm age	−
Booth and Chua (1996)	1977–1988	Log(offer price)	+
		Underwriter rank ∗ firm commitment	−
		Log(offer price) ∗ best effort	−
		Prior IPO activity (past 3 month)	−
		Prior IPO activity ∗ best efforts	−
		Industry IPOs (12 month) ∗ best effort	−
Beatty and Welch (1996)	1992–1994	Underwriter compensation (%)	+
		Log(1 + listed risks)	+
		Underwriter rank (market share)	+
		Inverse of offer price	−
		Auditor market share (residual)	−
		Lawyer compensation (residual)	−
Carter, Dark, and Singh (1998)	1979–1991	Secondary offering (%)	+
		Stock return standard deviation	+
		Log(offer size)	−
		Log(1 + firm age)	−
		Underwriter rank (Carter–Manaster)	−
Gompers and Lerner (1999)	1972–1992	Log(equity capitalization)	+
		Filing midpoint − offer price (%)	+
		Log(book to market)	−
		Underwriter rank	−
		Underwriter and venture investor	−
Lowry and Shu (2002)	1988–1995	Lawsuit likelihood estimate	+
		Market capitalization	+
		Technology firm	+
		Offer price − filing midpoint (%)	+
		Cum. market return (prior 15 days)	+
		Underwriter rank	−
		Venture backed	−
		NYSE/Amex listed	−
Lowry and Schwert (2002)	1985–1997	Technology firm	+
		Filing midpoint − offer price	+
		Filing midpoint − offer price > 0	+
		Underwriter rank	−
		Log(real total assets)	−
		National market system listed	−
		Amex listed	−
Hansen (2001)	1980–1999	Underwriter rank	+
		Stock return standard deviation	+
		Secondary offering proportion	+

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Table 8
(*Continued*)

Study	Sample period	Explanatory variable	Sign
		Log(offer size)	−
		Leverage (Debt/Assets)	−
		EBIT/Offer Proceeds	−
Habib and Ljungqvist (2001)	1991–1995	Underwriter spread estimate	+
		Filing midpoint − offer price	+
		Firm age	−
		Log(sales)	−
		Leverage	−
		Increase in shares outstanding	−
		Secondary shares (%)	−
		Other expenses	−
Ljungqvist and Wilhelm (2003)	1996–2000	Targeted direct share programs	+
		Proceeds for operating expenses	+
		Estimated price revision	+
		Estimated + price revision	+
		High tech industry	+
		Internet firm	+
		1999–2000 period	+
		Venture capital shareholdings	−
		Investment bank shareholdings	−
		Corporate shareholdings	−
		CEO shareholdings × Internet firm	−
		Ownership concentration	−
		Insider share sales	−
		Venture capital share sales	−
		Log(1 + firm age)	−
		Secondary offer (%)	−
		Increase in shares outstanding (%)	−
Edelen and Kadlec (2005)	1985–2000	Venture backing	+
		Underwriter rank	+
		Industry stk retns (filing to offer)	+
		IPO underpricing (prior 30 days)[a]	+
		Ave IPO offer price revision (30 day)[a]	+
		IPO offer price-filing midpoint[a]	+
		Log(offer size at filing)	−
		IPO offer price revision $< 0^a$	−
		Estimated probability of withdrawal	−
Kim, Palia, and Saunders (2005a)	1970–2000	Underwriter spread estimate	+
		Underwriter rank (market share)	+
		Lead underwriter not in top 25	+
		Commercial banks enter market	+
		Herfindahl index in I-banking	+
		Cumulative mkt. ret. (prior 15 days)	+
		Issuer profitability	−

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Table 8
(*Continued*)

Study	Sample period	Explanatory variable	Sign
		Issuer leverage	−
		Over-allotment option	−
Li and Masulis (2006)	1993–2000	Prior market return	+
		Underwriter reputation	+
		Venture capitalist share sale	+
		Internet issuer	+
		Global offering	+
		Prior market return	+
		New shares issued (%)	−
		Bank shareholdings	−
		Insurance co. shareholdings	−
		Issuer bank loans	−
		Venture capitalist shareholdings	−
		CEO shareholdings	−
		Fin'l institution shareholdings	−
		Log(total assets)	−
		IPO registration period	−
		Big 6 auditor	−
B. SEO studies			
Bhagat, Marr, and Thompson (1985)	1982–1983	Stock return residual variance	+
		Market return variance	+
		Stock beta	−
		Utility firms	−
Safieddine and Wilhelm (1996)	1980–1988	Abnormal short interest	+
		Lead underwriter rank	−
		Utility issuers	−
	1989–1991	Stock with listed options	+
	(Rule 10b-21)	Lead underwriter rank	−
		Utility issuers	−
Corwin (2003)	1980–1998	Stk ret stnd deviation (prior 30 days)	+
		Increase in shares outstanding (%)	+
		Lowest market cap quartile	+
		Highest standard deviation quartile	+
		Lowest stock price quartile	+
		Prior CAR < 0 (week prior to offer)	+
		Offer price tick size $< 1/4$	+
		Rule 10b-21 in force	+
		IPO underpricing in same month	+
		Close − Bid on day -1 (%) $*$ Nasdaq	+
		Log(stock price on day -1)	−
		Log(stock price) $*$ Tick size $< 1/4$	−
		Prior CAR $< 0 *$ Rule 10b-21	−
		NYSE listed	−
Altinkilic and Hansen (2003)	1990–1997	Nasdaq listing	+
		Relative offer size	+

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Table 8
(*Continued*)

Study	Sample period	Explanatory variable	Sign
		Inverse of stock price	+
		Stock return standard deviation	+
		Offer size	−
		Cumulative market return (from filing)	−
		Cumulative abnormal stock return	−
		Underwriter rank	−
Kim and Shin (2004)	1983–1998	Stk ret standard deviation (prior year)	+
		Rule 10b-21 in force	+
		Underwriter spread	+
		Underwriter rank	−
Mola and Loughran (2004)	1986–1999	Nasdaq listing	+
		Technology firm	+
		Underwriter spread	+
		Underwriter has top tier analyst	+
		Offer price is an integer	+
		Utility industry	−
		Log(closing price on day −1)	−
		Prior SEO	−
		Underwriter rank	−
Kim, Palia, and Saunders (2005a)	1970–2000	Underwriter spread estimate	+
		Commercial bank undrwrtrs allowed	+
		Cumulative mkt. ret. (prior 15 days)	+
		Inverse log(issue size)	+
		Market cap ∗ Inverse log(issue size)	−
		Underwriter rank (market share)	−
		Lead underwriter not in top 25	−

3.4. Dependence between underpricing and underwriter spreads

Mola and Loughran (2004) finds a significantly positive relationship for SEOs between underpricing and underwriter spreads. However, they do not fully control for the potential joint determination of these two costs. Kim, Palia, and Saunders (2005a) examines the relationship between underpricing and underwriter spreads. They find that in both SEOs and IPOs there is a positive relation between underwriter spreads and underpricing, though in the case of IPOs the relationship is driven by low quality issuers. They argue that these two flotation cost components can both be viewed as forms of underwriter compensation, which can be one explanation for their positive correlation. This evidence is consistent with Smith (1986), Hansen (1986) and Chen and Ritter (2000) who argue that underwriters and issuers jointly determining the direct and indirect costs of issuance.[16]

[16] Yeoman (2001) develops a model of net proceeds maximization where underwriter spreads and underpricing are interrelated. However, the predicted relationship is negative in his model.

Table 9
Summary of determinants of underpricing in IPOs and SEOs

Variables with significantly positive effects	Variables with significantly negative effects
A. Issuer characteristics	
Firm size	Log of prior stock price
Technology issuer	Log of total sales
Internet issuer	Log of book to market
Prior cumulative stock return	Issuer profitability
Stock return's (or residual) standard dev. or variance	Percentage of tangible assets
Nasdaq listing	Firm age or Log(1 + firm age)
Stock with listed options	NYSE/Amex listed; Stock beta; Leverage; Prior SEO indicator; Utility issuer
B. Offer characteristics	
Log of offer price	Log of offer size
Offer price is an integer	Log of offer price ∗ best effort
Offer price tick size less than 0.25	Inverse of offer price
Offer price revision from midpoint of filing range	Underwriter rank (market share)
Proceeds used for operating expenses	Underwriter rank ∗ firm commitment
Targeted direct share purchase programs	Lead underwriter not in the top 25
Log(1 + listed risks in SEC filing)	Qualified independent underwriter employed
Abnormal short interest in stock	Over-allotment option used
Estimated likelihood of a lawsuit	Auditor market share
Underwriter rank	Big 6 auditor
Underwriter with top tier analyst	Legal compensation
Herfindahl index for investment banking	Prior week cumulative stock return ∗ Rule 10b-21
Lead underwriter not in top 25	Log of prior stock price ∗ indicator of offer price tick size less than 0.25; Filing to offer date interval; Estimated probability of offer withdrawal

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To analyze the potential interdependence of spread and underpricing, Kim, Palia, and Saunders (2005a) employ three stage least squares to estimate the jointly determined underwriter spread and underpricing, which they note gives consistent estimates. They find three instruments that are significantly related to spreads, but not to underpricing (existence of a star analyst, issuers lacking two years of financial statements at the IPO date, standard deviation of daily stock returns for one year), and one instrument related to underpricing, but unrelated to spreads (market run-up over the prior 15 trading days). They point out that this interdependence raises some serious questions about the reliability of many earlier studies, which focus exclusively on underpricing or underwriter spreads, and generally do not control for the potential interdependence of these two flotation cost components. While the study makes a strong case for interdependence of underpricing and spreads, it is less convincing in its claims about the appropriate instruments needed to identify their three equation system.

Table 9
(*Continued*)

Variables with significantly positive effects	Variables with significantly negative effects
C. Market conditions	
Prior cumulative market return	Prior IPO activity
1999–2000 "Bubble" period	Prior IPO activity ∗ best effort
Average IPO underpricing in the prior month	Prior industry IPOs ∗ best efforts
Commercial banks allowed to underwrite securities	Industry stock returns (filing to offer date)
Rule 10b-21 in force	Negative industry stock returns (filing to offer date)
Global offering	Out of pocket expenses
Estimated or actual underwriter spread	Percentage secondary offer
Percent increase in shares outstanding and its interactions with: (1) lowest market capitalization quartile, (2) lowest stock price quartile, (3) highest stock return standard deviation quartile	Average offer price revisions in prior 30 days
D. Share ownership	
Venture capital backing	CEO shareholdings ∗ Internet firm
Venture capitalist selling shares	Issuer share ownership concentration; Investment bank shareholdings; Investment bank non-underwriter shareholdings; Commercial bank shareholdings; Commercial bank underwriter shareholdings; Venture capital backing; Venture capital shareholdings; Corporate shareholdings; Insurance company shareholder; Insider share sales; CEO share sale; Venture capital share sales; Commercial bank lender

Another serious methodological issue is the extent to which various explanatory variables found to be correlated with underpricing and underwriter spreads are themselves endogenously determined. In this category, underwriter ranking has been most extensively studied and Ljungqvist and Wilhelm (2003) and Habib and Ljungqvist (2001) conclude that it is endogenously determined. Habib and Ljungqvist also find evidence that the some of underwriting fees and out of pocket expenses, which they call promotion costs are significantly related to underpricing and endogenously determined as well. Habib and Ljungqvist also test whether number of shares sold is endogenously determined and conclude that is not.

Another explanatory variable that is often used in explaining underpricing is the price revision from the filing range midpoint, measured by the offer price minus the midpoint, divided by the midpoint. Since underpricing is also a non-linear function of offer price, there is a danger that this strong empirical association is being driven mechanically by the common component in the two measures.

3.5. Offering delays and withdrawals

Another component of expected flotation costs is the costs of bearing most of the out of pocket expenses associated with preparing a security offering without realizing the benefits of actually raising capital due to an offering cancellation. In addition, this capital short fall can have adverse implications for a firm's ability to pursue the positive net present value projects that it has available to it and may have a negative effect on the timing, size and pricing of a subsequent security offering. Interestingly, several early studies by Mikkelson and Partch (1986) and Officer and Smith (1986) reported that announcements of SEO withdrawals are greeted by a positive market reaction. Examining both SEO and convertible debt withdrawals, Jensen and Pugh (1995) report similar positive stock reactions. Altinkilic and Hansen (2006) report that SEO withdrawals are preceded on average by a precipitous stock price drop of 17 percent. To the extent that offer cancellation has negative implications for the firm's financial condition and the size of flotation costs and its ability to pursue investment projects, this positive price reaction suggests that the market was skeptical about the profitability of the firm's planned investment projects or else was concerned that the reason for the stock offer was that the stock was seriously overvalued, following the logic of Myers and Majluf (1984).

Edelen and Kadlec (2005) explore the implications of the risk of offer cancellation on the pricing of the offering. They observe that as offer price discount rises the risk of offer cancellation falls. This can explain why issuers are willing to go forward with offerings that they know are underpriced and why positive information released between the filing and offering dates is only partially incorporated into the final offer price as documented by Hanley (1993). Taking into account that some firms will have greater need for funds than others, and that new public information about the stock's value will vary across offerings, they are also able to develop a model to predict which offers will be more underpriced. In estimating the probability of offer withdrawal using a probit model, they find that it is significantly *positively* related to industry returns between the filing and offering date, prior IPO initial returns (30 days), log of the offer size, and withdrawals of earlier IPOs and significantly negatively related to prior IPO offer price revisions between the filing and offering dates (prior 30 days), and underwriter rank.

3.6. Underwriter competition

There is conflicting evidence on whether the market for underwriter services is highly competitive or oligopolistic. Chen and Ritter (2000) argue that the high frequency of 7 percent underwriter spreads in IPOs is evidence that this market is far from perfectly competitive. Hansen (2001) reports a number of pieces of evidence about the IPO process that supports the contention that this market is highly competitive, such as an IPO with 7 percent underwriter spread does not contain abnormal profits relative to other IPOs, that there is no evidence of monopoly profits in underpricing or unusual charges in subsequent SEOs, and that the 7 percent contract has persisted despite the

Department of Justice investigation of collusion allegations following the release of the Chen and Ritter (2000) findings. Hansen (2001) also reports that measures of concentration in the IPO market are well below the level considered by the Department of Justice to be anticompetitive. He notes that underwriters compete in many dimensions in addition to underwriter spreads, so that convergence to a common spread like 7 percent is not strong evidence of anticompetitive behavior.

Dunbar (2000) studies market share changes of book managers of IPOs and finds that they are negatively related to IPO first day returns and underwriter compensation (fees) and positively with analyst reputation.[17] This suggests that underwriters are competing implicitly, if not explicitly, on the level of IPO underpricing and underwriter spreads, contrary to the popular notion that banks do not cut fees to attract business. Corwin (2003) finds that seasoned offers were underpriced by an average of 2.2 percent during the 1980s and 1990s, with the discount increasing substantially over time, and that underpricing is significantly related to underwriter pricing conventions such as price rounding and pricing relative to the bid quote. Mola and Loughran (2004) also documents the increased usage of price rounding in setting SEO offer prices. These results appear to suggest a weakening in underwriter competition.

Adding to this debate, Burch, Nanda, and Warther (2005) examine underwriting fees of repeat security issuers to determine the relation between loyalty to a bank underwriter and the fees charged. They find that loyalty is associated with lower fees for common stock offers, but higher fees for debt offers. For both offer types, firms that graduate to higher ranked banks face lower fees. They also show that firms, which tend to switch banks to improve analyst coverage, pay higher fees in common stock offers, but do not pay higher fees in debt offers.

In contrast to this evidence, Ellis, Michaely, and O'Hara (2004) report that while many firms "graduate" to better underwriters, most firms move laterally or are downgraded in terms of lead underwriter ranking. They show that firms that graduate to a higher ranked underwriter must pay a premium for the privilege (i.e., above the fee charged by the same underwriter to an existing client for a similar deal), and, similarly, firms that use a lower ranked underwriter for their equity offering must also pay a premium.

Krigman, Shaw, and Womack (2001) studies underwriter selection in IPOs and finds that the quality of the analyst team is a key factor in underwriter selection. They also find that better performing IPO firms often switch to higher ranked underwriters for their SEOs. In addition, they conducted a field-based survey of chief financial officers (CFOs) and chief executive officers (CEOs) of IPO firms, who later switched underwriters, as to which factors were most important to their underwriter selections. Their survey reveals that the most important factors for issuers' senior management in selecting a lead underwriter are underwriters' and analysts' reputations, with issue pricing

[17] Interestingly, Dunbar (2000) also finds that banks lose market share if they are associated with overpriced IPOs, consistent with Booth and Smith (1986)'s certification theory.

and market making ability being moderately important and underwriting fees being the least important attribute. This ranking suggests that competition over underwriting fees is unlikely to have much explanatory power empirically. Mola and Loughran (2004) estimates the determinants of SEO underwriter market share and finds that a highly regarded analyst team increases the underwriter market share by 1.5 percent, adjusting for other factors (see their Table 5).

Ellis, Michaely, and O'Hara (2000) report that lead underwriters are initially the most active market maker in IPO stocks. Ellis, Michaely, and O'Hara (2004) find that the economic significance of lead underwriter market making declines as IPO stocks become seasoned over the following year. Corwin and Schultz (2005) show that number of market makers and analysts that are covering a stock rise with syndicate size. This suggests that the quality of underwriter market making and analyst coverage are likely to be less important to larger issuers, who benefit from greater investor interest. Consistent with this, Altinkilic (2006) reports that the market making component in SEO underwriting spreads is lower for larger firms.

Ljungqvist et al. (2004) document that analysts' recommendations relative to the consensus are positively associated with investment banking relationships and brokerage pressure, but negatively associated with the presence of institutional investors in the firm being followed. The latter result is especially strong when there are more institutions holding larger blocks in the firm, and for firms whose institutional holdings are concentrated in the hands of the largest institutional investors. They conclude that presence of institutional investors (who are primary customers of the analysts' services) provides an incentive mechanism for the analysts not to succumb to pressure to provide favorable opinions on their employers' investment banking clients and to boost brokerage business. Ljungqvist, Marston, and Wilhelm (2006) find optimistic analyst reports don't help underwriters win SEO assignments. Instead, they find that analysts' reputation, lending relationships and bond underwriting increase the bank's chances of winning underwriting assignments.

Ellis, Michaely, and O'Hara (2004) report that underwriters with continuing issuer relationships tend to charge lower fees, have optimistic analyst forecasts and are active in writing analyst reports. Banks competing for new SEO assignments often take actions in advance of an underwriting assignment: add analyst coverage, make optimistic analyst forecasts, do not compete on fees and do not become more active in market making services. Banks gaining new SEO assignments move quickly to: add analyst coverage, issue optimistic forecasts and increase their market making presence. Banks facing a weakened or terminated issuer relationship tend to reduce their analyst coverage, eliminate the positive bias in analyst forecasts, but do not reduce their market making services. They conclude that investment banks compete for follow-on equity offering underwriting business along multiple-dimensions (such as fees, underpricing discount, analyst coverage, market making, debt relationship, and overall reputation), and that underwriters who deliver on all these dimensions are retained by firms, and can be viewed as providing superior overall service to the issuer.

Fernando, Gatchev, and Spindt (2005) develops and empirically tests a model of firm-underwriter selection, where high (low) quality underwriters tend to sign contracts with high (low) quality issuers. In their empirical tests, they find that issuers and underwriters will associate with different partners for subsequent offerings if changes in issuer quality and/or underwriter reputation are large enough, suggesting that the association of issuers and underwriters is transactional rather than relationship-based. However, Kim, Palia, and Saunders (2005a) report evidence that the frequency of low (high) quality issuers using high (low) quality underwriters is as frequent as high (low) quality issuers employing high (low) quality issuers, which appears to be strong evidence against the Fernando, Gatchev and Spindt model.

Gande, Puri, and Saunders (1999) was the first study to examine the competitive effects of commercial bank entry into the corporate debt underwriting market. They find that underwriter spreads and ex-ante yields have declined significantly following commercial bank entry in the market, consistent with commercial bank underwriters with prior lending relationships with issuers having an information advantage over investment banks. They show that the reduction in underwriter spreads and ex-ante yields is strongest among lower rated and smaller debt issues, where commercial banks have underwritten a relatively greater proportion of these issues (as compared to investment banks). They also show that bank entry has tended to decrease market concentration, suggesting that commercial bank entry generally has had a pro-competitive effect. However, whether this is a short-term rather than a long-term effect is yet to be determined. Narayanan, Rangan, and Rangan (2004) study commercial bank entry into the equity underwriting market and report that commercial banks are increasing their roles as lead managers in equity underwriters, though they usually participate as a co-lead manager with an experienced investment bank.

Using a sample of SEOs from 1996–2001, Drucker and Puri (1989) finds that when a financial intermediary concurrently lends to an issuer and underwrites the firm's SEO, the issuer benefits through lower financing costs, receiving lower underwriter fees and lower loan yield spreads. This is particularly true for non-investment grade issuers, for whom the informational economies of scope are likely to be large. They show that concurrent lending also helps underwriters build relationships, increasing the probability of receiving future business. Specifically, they show that issuers with prior lending relationships receive lower underwriter spreads, while an underwriter with a prior lending relationship with an issuer is more likely to receive its subsequent underwriting assignments.

Wu and Kwok (2003) study global IPOs and the effects of competition by examining the pricing of global initial public offerings made by U.S. companies as compared to purely domestic offerings. They find that global participation significantly reduces underpricing (on average by four percentage points), and that underpricing is negatively related to the proportion of shares allocated to foreign investors. They conclude that U.S. companies time their global offerings when foreign demand for U.S. shares is high. Cornett, Davidson, and Rangan (1996) investigated the effects of Rule 415 on the

level of competition in the investment banking industry and find that it has weaken the competitive position of the smaller underwriters.

3.7. Rights and standby offerings

Since the 1950s, rights and standby offerings are used with less frequency in the U.S. However, they are still commonly employed by some regulated financial firms. Utilities, REITS, closed-end funds and conversions of mutual thrifts or insurance companies to stock charter are examples of right issuers discussed in the literature, e.g., Singh (1997), Khorana, Wahal, and Zenner (2002), Higgins, Howton, and Howton (2003), Howe and Shilling (1988), Masulis (1987). More recently, there has been a resurgence of the used of rights offers beyond utilities and financial firms by financial distressed industrial firms as reported by Heron and Lie (2004) and Ursel (2006).

3.8. Shelf registered offerings

In 1983 the SEC gave final approval to Rule 415, a new regulation that allowed security issuance under an expedited registration process. This option was only available to larger publicly listed firms. Bhagat, Marr, and Thompson (1985) studied direct and indirect flotation costs (underwriting fees and other expenses and underpricing) for a small sample of syndicated firm commitment and shelf issues found that shelf offerings have lower flotation costs than traditional book building method.

Sherman (1999) develops a model of underwriter certification and the effect of shelf registrations. She concludes that shelf registrations increase underwriter competition and reduce the quality of their due diligence investigations. Blackwell, Marr, and Spivey (1990) examine whether shelf issues reduce underwriters due diligence investigations and results in higher underpricing. They report that underwriter spreads vary with issuer quality and that weaker issuers have to pay a premium relative to firms using a firm commitment offering. Denis (1991) reported that most industrial security issuers used shelf offerings primarily for debt securities, which have much lower due diligence concerns. Denis (1993) finds that firms that use shelf registrations some of the time, also have lower non-shelf SEOs flotation costs. Thus, the inference about the cost saving associated with using shelf registration was thrown into question. However, Dennis also notes the low frequency of shelf registered SEOs is consistent with there not being a cost advantage.

More recently, shelf registration was expanded in 1992 to universal shelf issues, which allows the offering to be either debt or equity. This change is likely to intensify underwriter competition. Since the rule change, universal shelf registrations have dominated equity shelf registrations. Moreover, a greater portion of universal shelf issues result in equity offerings. Autore, Kumar, and Shome (2004) revisited the issue of flotation costs and the impact of shelf registration. They report that shelf issues of SEOs have overtaken non-shelf issues as the dominant flotation method beginning in 2001 for NYSE, Amex and Nasdaq listed firms. They report that 85 percent of shelf registrations result in no subsequent offer. They find that shelf issues have lower costs and

greater timing flexibility. These results hold up after adjusting for the self-selection bias highlighted in the early Denis (1991) study. They also separately study universal shelf issues that result in an SEO. They note that shelf issues create valuable options that become more valuable under more volatile market conditions. Bethel and Krigman (2004) re-examine the question of reduced due diligence in shelf issues. They report that high asymmetric information issuers experience high discounts from using the shelf registration mechanism, which explains why this mechanism isn't more widely employed.

3.9. Over-allotment options, warrants and other direct expenses

Over-allotment options. A second component of underwriter compensation is an over-allotment option, which is a warrant to buy an additional 10–15 percent of the offering at the same price as the SEO/IPO. The typical over-allotment option has a maximum life of 30 days. Underwriters can use these options to lower their risk exposure in a firm-commitment underwriting contract. This underwriter hedging activity in the IPO market is the focus of a study by Aggarwal (2000). She finds that underwriters exercise over-allotment options to cover short positions created by underwriters over-selling securities in public offerings when the after-market stock price rises relative to the offering price. She also finds that underwriters buy shares in the after-market to cover short positions when the stock price falls to the offering price or lower.

Over-allotment options can alternatively be viewed as valuable short term warrants held by underwriters that allow them to purchase up to an additional 15 percent of an undervalued offering at the underwriter's discount from the public offer price. Little research is available on the value of these options, with the exception of an early study by Hansen, Fuller and Janjigian (1987), who examine over-allotment options in SEOs of industrial firms. They estimated the value of the typical over-allotment option to be 1 percent of the offer's gross proceeds. They also report that about half their offer sample had over-allotment options. Using a logit model, they find that over-allotment options are more frequent in offers with smaller dollar size, larger relative size, greater stock and market return variances and more retail oriented (strong broker system) underwriters. In the IPO market, Lee et al. (1996) report that virtually all U.S. issues include over-allotment options and nearly all are for 15 percent of the original issue size and are issued at-the-money. Further, about 60 percent of the options are either partially or fully exercised, with the vast majority fully exercised.

Warrants as additional underwriter compensation. Several studies by Ng and Smith (1996) and Dunbar (1995) investigate the use and importance of warrants as an additional element of underwriter compensation in SEOs. Controlling for the selectivity imbedded in the choice of using warrants as added underwriter compensation with a logit model, they find that warrant use reduces the overall flotation costs of SEOs. Since warrants are less valuable when the underlying stock is overvalued, the credibility of smaller and less well known underwriters is increased when they accept warrants as compensation. This can reassure investors who could otherwise question the credibility of less reputable underwriters, thus lowering the average SEO underpricing necessary to sell these issues.

Other direct flotation expenses. The analysis of the other expenses such as registration and listing fees, legal and accounting and printing expenses is fairly limited. Smith (1977) finds for firm commitment SEOs that other direct expenses average about 1.15 percent of the offer price. He also examines the determinants of these other direct expenses and finds them to be functions of flotation method and offer size, measured by gross proceeds. His evidence documented a strong economy of scale effect in direct total flotation costs, with the smallest offerings having total direct costs ranging from 14 to 15 percent and the largest offerings having a total cost of less than 4 percent. Altinkilic and Hansen (2000) argue that a large fraction of these fees (85 percent) are a variable cost. There is little added information on other expenses.

Eckbo and Masulis (1992) estimate the determinants of direct flotation costs (sum of underwriting fees and other expenses). They find that on average direct flotation costs average over 6 percent for industrial issues and 4.25 percent for utility issues. They also report that they have a non-linear relationship to size (−), percentage change in outstanding shares (+ for industrials), log of holdings per shareholder (−), prior stock return standard deviation (+) and an indicator of underwritten firm commitments and standby offers (+).

Habib and Ljungqvist (2001) analyze the relationship of out-of-pocket expenses plus underwriting fees (which they term "promotion costs") and underpricing. They develop a model that assumes that the issuer makes decisions to minimize the wealth loss of going public, which includes the cost of underpricing and the promotion costs. They predict that promotion costs increase with the portion of the IPO that represents insider selling (size of secondary offer), the relative offer size and uncertainty. In testing their model they take account the endogeneity of underpricing, promotion costs and underwriter rank. They find that promotion costs are positively related to the estimated relative offer size, estimated proportion of insider sales and several risk proxies, namely underwriting fees and the log of sales while they are negatively related to gross proceeds and firm age. These results support the predictions of their model.

Other flotation costs of rights. Rights offerings are generally used only in SEOs. As noted earlier, a rights offer involves issuing short lived in-the-money warrants to existing shareholders on a pro-rata basis. This issue method differs substantially from a firm commitment method and has several potentially large indirect issue costs, which are borne by the issuer and its shareholders.[18]

(1) *Capital gains taxes*. In a rights offer, shareholders who do not wish to purchase shares of the issue must sell their rights (or subscribe and sell the shares) in order to avoid losing the value of their subscription rights or warrants. These sales are subject to capital gains taxes, which are increasing in the subscription price discount, discouraging large discounts.

[18] This discussion is partially drawn from Eckbo and Masulis (1995).

(2) *Stock liquidity and transaction costs of reselling rights*. The resale of rights by current shareholders takes place on organized exchanges, entailing dealer spreads and brokerage fees. Since shareholders avoid these costs when the firm employs an underwriter to sell its new shares, a rights offer carries an added transaction cost disadvantage for shareholders uninterested in exercising their warrants. Kothare (1997) argues that rights issuers have typically high ownership concentration, and a rights offering tends to increase concentration. The result is a higher adverse selection effect associated with buying the stock (or the rights), which Kothari finds raises the stock's bid–ask spread and this reduced liquidity is likely to lower the stock's market price.

(3) *Arbitrage activity and the risk of rights offer failure*. Investors can use rights as warrants to hedge their short sale positions in a firm's stock. This encourages increased short selling of the stock, but as additional short positions are opened, the stock price will tend to be depressed as resulting sell orders rise (at least within the bid–ask spread). Thus, between the announcement of rights offer terms and offer expiration, this short-selling activity tends to keep the stock price down, reducing the attractiveness of exercising rights for most stockholders. This creates additional uncertainty for issuers as to the ultimate rights offer subscription level.

(4) *Anti-dilution clauses and wealth transfers to convertible security holders*. If a firm has convertible securities or warrants outstanding with anti-dilution clauses in place, then issuing rights at discounts can trigger automatic reductions in conversion rates of these securities as discussed in Kaplan (1965) and Myhal (1990). These anti-dilution clauses are likely to result in improved positions for the convertible security holders, shifting wealth away from the common stock holders who are the residual claimants. As a result, there is an added incentive for firms with convertible securities outstanding to avoid issuing rights at deep discounts.

3.10. Market microstructure effects

Seasoned public offers of common stock have important impacts on the secondary market in which the common stock trades.[19] The typical firm commitment offer involves a large increase in shares outstanding along with a large increase in the number of stockholders and a reduction in management and blockholder percentage ownership. As a result, one would anticipate that there would be major increases in trading volume, changes in bid–ask spread and depth, increased insider trading at the end of the lock-up period, and possibly major changes in price volatility after the public offering. One would also expect similar effects on secondary market trading of corporate bonds following subsequent bond offerings of similar seniority and duration bonds.

Theories of bid–ask spread determination are based on adverse selection and inventory cost considerations. These theories predict that if trading volume rises and price

[19] Parts of this section are drawn from Eckbo and Masulis (1995).

volatility falls, then bid–ask spreads will also fall since the expected costs of market making decline. The SEO announcement per se can also lower the asymmetric information about the firm's stock price borne by market makers, which would cause bid–ask spreads to drop further.

Amihud and Mendelson (1986) develop a valuation model of security pricing that assumes that investors have a positive preference for liquidity measured by percentage bid–ask spread. They derive a model of security pricing where the expected return is a positive and concave function of bid–ask spread. Amihud and Mendelson (1988) extend the implications of the model and present evidence that liquidity is an important determinant of security value. They argue that managers seeking to maximize current stockholder wealth should take market liquidity into account when making corporate financing decisions. Thus, in deciding whether to make an SEO and in choosing the flotation method, liquidity implications need to be taken into account. A further implication is that the negative adverse selection effect of the offer announcement can be partially offset by the positive liquidity effect.

Lease, Masulis, and Page (1991) explore the market microstructure effects of firm commitment SEOs for NYSE and AMEX listed firms. They document that share trading volume rises substantially and that price volatility falls subsequent after the SEO. Not surprisingly, both dollar bid–ask spreads and percentage spreads fall significantly after the seasoned public offering, consistent with inventory cost and adverse selection cost models of bid–ask spread determination. They also report that trading volume and price volatility fall between the announcement and the offer dates, while bid–ask spreads drop, but not to the level observed subsequent to the public offer. This is suggestive of a modest increase in liquidity following the SEO announcement and a significant improvement after the SEO. Not withstanding the improvement in stock liquidity, Altinkilic and Hansen (2006) report that on average issuer stocks experience an abnormal negative return of 2.6 percent over the week prior to the SEO. They also find that this effect cannot be explained alone by a short term price reversal effect in the immediate post-SEO period and suggest that this is due to a negative information effect related to the underwriting process.

Tripathy and Rao (1992) examine the market microstructure effects of SEOs for NASDAQ listed firms. They split their sample into large and small capitalization stocks and that larger stocks have increases in bid–ask spread over a 60 day period prior to an SEO announcement, which is followed by decreases in spread over the next 43 days. In contrast, small stocks experience increases in spread from 80 days prior to the announcement through 20 days after the announcement. Focusing on the public offering date, they find that the bid–ask spreads of large stocks decrease over the 20 days prior to the offering and decrease even more over the 20 days following the offer. Spreads of small stocks increase over the 20 days prior to the offering, but then decrease beginning just before the offering through 20 days after.

Masulis and Shivakumar (2002) separately investigates the speed of price reactions measured in 15 minute intervals to SEO announcements by NYSE/Amex and Nasdaq listed stocks. They report that Nasdaq listed stocks react more quickly to these an-

nouncements (by about an hour) and attribute it the differences in the organizational structure of the NYSE/Amex and Nasdaq market places. They find evidence consistent with NYSE/Amex limit order books and market opening mechanisms slowing price reactions to news. They also report a large number of trading halts (21%) on the NYSE around daytime SEO announcements, while there are very few on Nasdaq.

Stock offers can also cause temporary biases in daily stock returns by disrupting normal buy-sell order flow in the secondary market. Lease, Masulis, and Page (1991) document that around the public offer dates of SEOs stock returns are biased downward due to the loss of purchase orders to the temporary primary market in the stock. One result is that stock transaction prices tend to occur at the lower ask quote, rather than at the midpoint of the bid and ask, which generates an apparent fall in the stock price. There is also evidence that market makers may lower their quotes in this period due to a positive imbalance in their inventory position resulting from the predominance of sell orders at this time. Lease, Masulis and Page find that using the closing bid–ask average rather than the closing transaction prices eliminates the statistical significance of the drop and reduces by more than half the average negative offer date return.

Several more recent studies explore the impacts of market microstructure on securities issuance. Presumably, as lead underwriter they have better knowledge of potential buyers and sellers, which should give them a competitive advantage in market making immediately after the IPOs, especially for larger orders. Ellis, Michaely, and O'Hara (2000, 2004) report that the typical lead underwriter is highly active as a market maker immediately following the IPO, but that this role diminishes over the following year. Corwin, Harris, and Lipson (2004) examine IPOs listed on the NYSE and report that initial buy-side liquidity is higher for IPOs with high quality underwriters, large syndicates, low insider sales and high pre-market demand (offer is priced at or above the maximum filing range price), while sell-side liquidity is higher for IPOs that represent a large fraction of outstanding shares and have low pre-market demand (offer is priced at or below the minimum filing range price). Limit order trading is very weak on the first day of trading, though there is an unusual number of limit buy orders submitted at the offer price for cold IPOs, which are likely to be underwriter stabilization bids. They also report that pre-opening order flow is a good predictor of first day prices and are reflected in the opening price set by the specialist. Field, Cao, and Hanka (2004) study the effects of lock-up expirations on IPO stocks and find that substantial increases in insider trading by officers and directors in almost 25 percent of cases do not adversely affect stock liquidity. They find only a 3 percent increase in effective bid–ask spreads that lasts only about one week, while depth and trading activity substantially improve.

Mola and Loughran (2004) studies the effects of market microstructure factors on SEO underpricing, along with the effects of underwriter competition. They find that the offer price discount is positively related to relative offer price, a tech indicator, gross spread and a top tier analyst indicator and negatively related to a utility indicator, log of share price, a high underwriter reputation indicator and an integer offer price indicator. Mola and Loughran conclude that changing issuer composition toward smaller, riskier Nasdaq listed issuers and increasing underwriter market power measured in terms of

underwriter market share, underwriter reputation and analyst quality can explain this phenomenon. As discussed earlier in the SEO underpricing section, Corwin (2003) also explores many of these issues. In addition, Butler, Grullon, and Weston (2005b) find that the underwriter spreads are negatively related to a wide range of stock liquidity measures, while Altinkilic (2006) reports that spreads are directly related to market making effort.

3.11. Miscellaneous offerings

3.11.1. Global offerings

Global issues are often sold through an ADR or GDR mechanism to minimize foreign exchange issues for foreign investors. Under these mechanisms, a depository bank holds the original stock and issues new shares that are denominated in local currency and pays cash dividends in the local currency. Global offerings by U.S. firms generally use the GDR mechanism. The supply of ADRs or GDRs can be expanded or contracted by the depository bank purchasing more shares of stock or selling back some of its shareholdings with the creation or redemption of a like number of claims to these shares through the issuance or redemption of ADRs/GDRs. Foreign issuers selling shares in the U.S. must register their securities under Rule 144A as is discussed in greater detail below.

The implication of cross listing of its stock on firm value is studied by Doidge, Karolyi, and Stulz (2004). They argue that cross-listing in the United States helps controlling shareholders of foreign firms commit to limit their expropriation of minority shareholders, since U.S. security laws are stricter than most other jurisdictions. They also argue that cross-listing increases the ability of these firms to raise equity capital at more attractive terms, allowing the firms to take advantage of their growth opportunities. They show supporting evidence in that foreign companies with shares cross-listed in the U.S. had market to book ratios (at the end of 1997) that were 16.5 percent higher than that of non-cross listed firms from the same country, and that growth opportunities are more highly valued for firms that cross-list from countries with weaker investor rights (also, see LaPorta, Lopez-de-Silanes, and Shleifer, 1999).[20]

Ljungqvist, Jenkinson, and Wilhelm (2003) examine the tradeoff between investor demand estimation methods (book building versus fixed-price) and the costs associated with hiring an underwriter for initial public offerings (IPOs). Book building conditions the final issue price on market demand conditions, whereas in case of a fixed-price method, shares are priced first and then later put up for subscription. Using a dataset containing 2,143 IPOs by issuers from 65 countries outside the United States during January 1992–July 1999, they show that book building, when used in combination with U.S. banks (as underwriters) and U.S. investors, can reduce underpricing significantly relative to fixed-price offerings or book building efforts by other banks. They attribute

[20] For a more recent survey of the literature on cross-listings, see Karolyi (2006).

this result to the fact that because of their longer book building experience, U.S. banks are more likely to have access to key institutional investors and may be in a better position to reward investors dynamically for their information revelation. Interestingly, they show that for most issuers, the gains associated with lower underpricing outweighed the additional costs associated with hiring U.S. banks, such as the 7 percent gross spread that is typically paid when U.S. banks are involved (see Chen and Ritter, 2000, and Hansen, 2001).

Wu and Kwok (2003) study the underpricing, underwriting fees and direct expenses of global IPOs. They report that global offers significantly reduce underpricing by 4 percentage points relative to purely domestic IPOs. The result can not be explained by potential selection bias in the offering decision. Underpricing is found to be a decreasing function of the relative size of the global tranche. They also find that global offers are more likely as the prior performance of the U.S. stock market rises. They also find no evidence of differences in underwriting spreads or other expenses.

Bruner, Chaplinsky, and Ramchand (2004) examine the direct and indirect costs of raising equity capital for a sample of 293 first-time foreign IPOs in the United States (i.e., these companies did not have their stock traded in a domestic market or other foreign market prior to the IPO) and compare the costs to those of U.S. IPOs. They conclude that in general foreign IPOs experienced approximately the same capital raising costs as the U.S. IPOs, with the exception of foreign firms with strong investor demand and upward revisions to offer prices that incurred a smaller underpricing than that of U.S. IPOs.

Chaplinsky and Ramchand (2004) analyze the choice between issuing public and private (under Rule 144A) debt by foreign firms. They conclude that SEC Rule 144A, which permitted firms to raise capital (in terms of both debt and equity) from qualified institutional buyers without requiring registration of these securities or compliance with U.S. GAAP, has resulted in the Rule 144A debt market replacing the public debt market in terms of number and volume of foreign debt issuers, especially for high-yield and non-rated issues.

3.11.2. Convertible securities and warrants issuance

Convertible debt and equity securities can be viewed as a method of issuing stock in the future, contingent on the issuer's financial conditional improving. As such, these securities are very similar to issuing warrants plus straight debt or preferred stock. These securities are often issued by privately held firms, which are raising capital from venture capitalists. These convertible securities are generally convertible preferred stock with an automatic conversion into common stock if the firm goes public. Unlike public issues of convertible securities, these privately placed equity issues generally carry powerful governance rights and may also have the feature that on conversion to common stock, the liquidation rights of the preferred issue may not have to be relinquished.

Public offerings of convertible securities are frequently convertible debt or straight debt with detachable warrants. These convertible securities are generally issued out-of-

the-money with American exercise rights over most or all of the security's life. Many of these securities are also callable, which is a method that allows the issuer to force the in-the-money convertible securities and warrants to convert their securities to common stock. Also, typical convertible securities held by venture capitalists automatically convert to common stock at the time of an IPO. Lastly, many convertible securities are not protected against cash dividends, which can again create incentives on the part of the option holder to exercise their conversion rights early, so as to avoid the stock price fall associated with the ex-dividend effect. Mayers (1998) argues that firms with significant real options can benefit from issuing convertible securities that don't have to be exercised until after the real options are exercised. This is similar to staged financing in the private equity market. Mayers finds that prior to calls of convertible bonds, firms exhibit increases in capital expenditures and new long term debt financing, consistent with the exercise of important real options.

There have been a variety of studies of convertible debt, convertible preferred stock and warrant issue including: Brennan and Schwartz (1982), Stein (1992), Nyberg (1995), Kang and Lee (1996), Mayers (1998), Lewis, Rogalski, and Seward (1998), Byoun and Moore (2003), Korkeamaki and Moore (2004), and Brick, Palmon, and Patro (2004). Most of these studies have focused on offering methods, offering frequencies and announcement effects. A few of these studies have also examined components of flotation costs.

3.11.3. Private placements of equity and convertibles

Wruck (1989) was first to study private placements of equity by publicly listed firms. She documented that these negotiated sales of equity by large NYSE listed firms had a positive mean announcement effect of 4.5 percent on the issuer's stock price unlike the average negative announcement effects of public offerings of stock. She analyzes the changes in shareholder ownership and concentration and documents that a private placement on average increases the voting power of the dominant blockholder and reduces the voting power of management. She finds that the change in stock value is strongly correlated with the change in ownership concentration. Sales that afterwards give the blockholder under 5 percent or more than 25 percent ownership have positive effects, while intermediate blocks result in negative effects. Moreover, sales that result in a change in control or an increase in management shareholdings have a negative effect. She argues that increasing shareholder concentration often increases shareholder wealth by improving firm efficiency and alignment of interests with outside shareholders, but at times can adversely effect outside shareholder wealth, when it is likely that substantial firm resources are diverted to private benefit.

In a follow up study, Herzel and Smith (1993) examine private placements by primarily smaller Nasdaq listed firms. They document that private placements are sold on average at substantial discount of 20 percent relative to public offerings. They argue that this underpricing is to compensate private placement investors for their investigation costs prior to investing, while the positive announcement effect reflects the positive

information effect associated with a sophisticated institutional investors agreeing to purchase shares, rather than improved monitoring of management by blockholders. Hertzel and Smith also report that institutional investment declines in private placement firms.

Wu (2004) examines the identity of private placement investors. She reports that private placement firms have higher asymmetric information than firms that rely on public offerings based on issuer age, lack of venture capital backing, fewer institutional investors and wider bid–ask spreads and coverage by fewer analysts. Also, she finds that private placement investors who engage in more intensive monitoring (i.e., venture capitalists and pensions funds) are not increasing their holdings in these firms after the private placements. This result is inconsistent with increase monitoring of management after the private placement. Finally, discounts on private placements sold to managers are higher than those when managers are not involved. These discounts are also higher when managers' initial holdings are lower. These last two results are consistent with management self-dealing. Wu also reports that private placement investors are typically passive, which is consistent with the evidence of Barclay, Holderness, and Sheehan (2005).

Gomes and Phillips (2005) examine a comprehensive sample of 13,000 private and public security issues of debt, convertibles and common stock by publicly listed firms. They find that in the recent 2000–2003 period private issues exceed public issues. Gomes and Phillips report that publicly listed firms with higher levels of asymmetric information (measured by analysts' earnings forecast errors or dispersion in earnings forecasts) are more likely to issue debt in the public market, while they are more likely to issue riskier equity and convertible securities in the private capital market. They also find that smaller public firms with higher risk, lower profitability and good investment opportunities are more likely to issue equity and convertible securities privately, while public equity issues are more likely for firms experiencing a stock price rise in the prior year relative to a benchmark portfolio.

More recently, a new type of private placements of equity by public companies (PIPES) has become popular, especially with small and medium size companies. The PIPE market originated with the SEC adoption of Regulation S in 1990, which permitted U.S. issuers to sell unregistered shares to foreign investors at any price in off shore markets without first registering them with the SEC or publicly disclosing them. In 1996, the SEC modified its rules to require issuers to report the sale of Reg S shares and required investors to hold these shares for a year. To gain greater liquidity, issuers typically registered the PIPE shares with the SEC via a shelf registration within 30 days of closing of the deal. The securities typically become effective 90 days after registration.

There are two major types of PIPEs. There are traditional PIPEs that are fixed number of shares or a convertible with a fixed strike price, which can be sold at a discount through private negotiations and there is a more recent innovation called structured PIPEs. Structured PIPEs represent convertible securities having variable strike prices that decline if the underlying stock prices decline beyond a specified interval. A structured PIPE allows investors to convert into a larger number of shares if the stock price

declines, thereby giving investors significant downside protection.[21] Not surprisingly, Brophy, Sialm, and Ouimet (2005) report that younger firms with weak performance in industries with high growth rates and risk levels (i.e., greater adverse selection) are the primary issuers. The typical investors in PIPEs are hedge funds.

3.11.4. Unit offerings in IPOs and SEOs

Unit offers involve the issue of a combination of common stock and warrants by an issuer. One potential advantages of selling units rather than shares is that when an issuer is very risky the market is apt to overestimate its leverage and its return volatility, which causes its warrants to be overvalued, while the stock is apt to be undervalued. The result of selling a unit is that these two effects are combined and become partially offsetting, which means firms sell the unit offers at closer to its true market value. This is similar to Brennan and Schwartz (1982) argument for why firms issue convertible securities. Warrants also give investors more time before committing to buy equity, which acts as a credible signal that the issuer holds no negative proprietary information about the firm's value. Taking into account the callability of many warrant and convertible issues and the cost of financial distress Stein (1992) argues that this can be a backdoor means of selling more equity, when the market over-estimates the adverse selection risk associated with the issuer. He finds that firms with intermediate levels of risk should issue convertibles. Unit offers of SEOs have been studied by Schultz (1993), Chemmanur and Fulghieri (1997) and Byoun (2004).

3.12. Conflicts of interest in the security offering process

Recently there has been a stream of new research exploring potential conflicts of interest by decision makers in the security offering process. These conflicts are sometimes between managers and securityholders, and in other cases between underwriters and either security investors or security issuers. A key question is whether these potential conflicts are large enough to alter the security underwriting process to a measurable degree and if so, do any underwriter customers suffer any serious financial consequences. A second important question is whether there are significant economic benefits from combining underwriting and other financial services.

One major concern is that at least some managers make security issuance, pricing, and underwriting decisions to benefit themselves, rather than their shareholders. Managers can accomplish this by issuing underpriced securities to friends and family, or capturing side payments from underwriters, for instance through underwriter allocations of other firms' underpriced IPOs, often called spinning or receiving new stock options exercisable at the IPO offer price, which represent valuable in-the-money options. Studies that explore this line of research include Jung, Kim, and Stulz (1996) who

[21] A similar security is studied by Hillion and Vermalen (2004). They investigate floating rate convertible debt, which adjusts the conversion ratio for stock price drops.

tests whether firms undertaking SEOs when facing poor growth opportunities, measured by market to book ratios, are experiencing agency conflicts between managers and shareholders. Consistent with this hypothesis, they find that some firms with poor growth opportunities do undertake SEOs and that these firms have more negative announcement effects. Ljungqvist and Wilhelm (2003) finds that managers participating in friends and family programs and not making secondary offerings are more apt to have underpriced IPOs. Datta, Iskandar-Datta, and Raman (2005) presents indirect evidence that on average SEO announcement effects are positively related to managers' equity based compensation, so greater equity based compensation is associated with less negative announcement effects. Kim and Purnanandam (2006) reports a similar finding.

Turning to the management compensation effects of IPOs, Lowry and Murphy (2006) examines whether IPOs are underpriced more because managers obtain more valuable stock options with lower strike prices (set at the offer price) when new stock option plans are established at the IPO date. They find no evidence of a positive relation between underpricing and IPO option grants, which does not support a serious conflict of interest effect.

A second avenue of concern is that underwriters may have conflicts of interest with their customers due to joint production of underwriting and other financial services including brokerage, market making, security analysis, venture capitalist investing, lending and asset management, to name a few. Many researchers have investigated whether the joint production of these services creates serious conflicts of interest or whether there are significant economies of scale or scope realized from sharing financial information produced in the course of performing one or more of these services. Since financial service providers need timely information about customers' financial strength, joint production of information or sharing of this information can be particularly cost efficient.

Of all of these related services, the area that has elicited the most research interest is security analysis by underwriting firms. Underwriters seek to reduce the time and expense of selling a security offer and to lower their risk of offer failure, and the question is whether these incentives dominate the analyst's reputation concerns near security offering dates, causing sell-side analysts to hype these issues through overly optomistic earnings forecasts and investment recommendations. Michaely and Womack (1999) report evidence of such a bias. However, more recent evidence does not support this finding. Kadan et al. (2005) report that after the 2002 NYSE and NASD rules regulating sell side analyst's investment banking relationships, there is no evidence that analysts issue optimistic earnings forecasts. However, these same analysts remain reluctant to recommend selling stocks that their investment banking arms are underwriting. Other studies that find affiliated analysts do not make more optimistic earnings forecasts includes: Kolasinski and Kothari (2004), O'Brien, McNichols, and Lin (2005), Barber et al. (2005), Agrawal and Chen (2004) and Ljungqvist, Marston, and Wilhelm (2006).

There is a stream of literature including Puri (1994, 1996, 1999), Gande et al. (1997), Schenone (2004), Chaplinsky and Erwin (2005), Drucker and Puri (1989) and Li and

Masulis (2006) examining situations where lenders are also debt or equity underwriters. The basic concern is that underwriters who are also lenders have incentives to underwrite weak security issues to strengthen the financial condition of borrowers. These studies generally find no evidence supporting a significant conflict of interest effect.

Another potential underwriter conflict of interest with IPO investors occurs when IPO underwriters are also venture investors since venture investors realize substantial financial benefits when their portfolio firms complete IPOs. Several recent studies by Li and Masulis (2005, 2006) examine whether underwriters alter their underwriting and pricing decisions when they have venture investments in these issuers. However, they find no evidence to support underwriters weakening their underwriting standards to improve the returns on their venture investments.

4. The flotation method choice

In this section, we examine the firm's choice of issue method. We start with the so-called rights offer paradox first observed by Smith (1977). The paradox highlights the fact that a focus on *direct* issue costs alone fails to adequately explain the near disappearance of the rights offer method for large, publicly traded corporations in the U.S. We then examine how observed flotation method choices may minimize issue costs under asymmetric information and survey the empirical evidence on announcement effects of security offerings as a function of the flotation method.

4.1. The paradoxical decline in the use of rights

With symmetric information between corporate insiders and outside investors, standard economic theory predicts a preference for the relatively inexpensive uninsured rights offer method for floating seasoned equity. Nevertheless, Table 10 shows that as of the mid-1970s, publicly listed companies in the U.S. have virtually abandoned the rights issue method in favor of firm commitment underwritten offerings.[22] Furthermore, this phenomenon is not restricted to U.S. offerings. Ursel and Trepanier (2001) show a strong trend towards declining use of rights and increasing use of public offerings in Canada 1970–1985. The trend away from rights is also evident in Japan: Table 11 shows a dramatic decline in rights offerings after the mid-1990s. Slovin, Sushka, and Lai (2000) report that uninsured rights represents a small fraction of total SEOs by British firms listed on the London Stock Exchange. In Hong Kong, rights are also now in a minority (Wu, Wang, and Yao, 2005). Bøhren, Eckbo, and Michalsen (1997) present evidence that issuers on the Oslo Stock Exchange have moved from uninsured rights

[22] A corporation's charter originally stipulates that shareholders have the first right of refusal (preemptive right) to purchase new equity issues. Thus, abandoning the rights method requires a shareholder vote in favor of eliminating the preemptive right. Such charter amendments became popular among U.S. publicly traded firms in the early 1970s, preceding the move towards firm commitment offerings. See also Bhagat (1983).

Table 10
SEOs by NYSE- and AMEX-listed firms, classified by flotation method (FC = firm commitments, Stand = standby rights), 1935–1955 and 1963–1981[a]

	Total issues				Industrial issues				Utility issues			
	Total	FC	Stand	Right	Total	FC	Stand	Right	Total	FC	Stand	Right
1935	6	1	3	2	5	–	3	2	1	1	–	–
1936	37	11	17	9	37	11	17	9	–	–	–	–
1937	40	15	18	7	39	15	17	7	1	–	1	–
1938	5	2	–	3	4	1	–	3	1	1	–	–
1939	13	6	3	4	8	5	3	–	2	1	–	1
1940	18	9	4	5	13	7	4	2	3	2	–	1
1941	9	1	3	5	9	5	3	1	6	2	–	4
1942	1	1	–	–	1	1	–	–	–	–	–	–
1943	14	8	5	1	13	7	5	1	1	1	–	–
1944	23	13	9	1	22	12	9	1	1	1	–	–
1945	52	23	18	11	45	20	15	10	7	3	3	1
1946	110	73	24	13	96	65	21	10	14	8	3	3
1947	53	27	12	14	29	19	5	5	24	8	7	9
1948	61	20	20	21	28	11	9	8	33	9	11	13
1949	79	27	30	22	14	7	5	2	65	20	25	20
1950	84	35	31	18	30	16	9	5	54	19	22	13
1951	131	61	49	21	63	40	16	7	68	21	33	14
1952	131	66	43	22	71	41	20	10	60	25	23	12
1953	120	55	47	18	43	28	11	4	77	27	36	14
1954	101	51	33	17	51	36	11	4	50	15	22	13
1955	113	44	56	13	56	29	25	2	57	15	31	11
1935–1955	1,201	549	425	227	677	376	208	93	525	179	217	129
1963	12	2	6	4	5	1	3	1	7	1	3	3
1964	17	8	6	3	8	4	3	1	9	4	3	2
1965	20	5	9	6	11	5	4	2	9	0	5	4
1966	27	12	12	3	17	7	8	2	10	5	4	1
1967	26	12	9	5	17	9	4	4	9	3	5	1
1968	44	26	9	9	31	20	4	7	13	6	5	2
1969	42	24	15	3	22	13	7	2	20	11	8	1
1970	49	36	10	3	22	18	2	2	27	18	8	1
1971	84	65	15	4	44	40	2	2	40	25	13	2
1972	81	68	11	2	29	27	1	1	52	41	10	1
1973	58	50	6	2	12	10	1	1	46	40	5	1
1974	53	47	4	3	6	5	0	1	47	42	3	2
1975	89	79	8	1	20	19	1	0	69	60	8	1
1976	93	88	3	1	30	29	1	0	63	59	3	1
1977	65	62	3	0	2	2	0	0	63	60	3	0
1978	90	86	3	1	25	23	2	0	65	63	1	1
1979	85	81	2	2	21	20	0	1	64	61	2	1

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Table 10
(*Continued*)

	Total issues				Industrial issues				Utility issues			
	Total	FC	Stand	Right	Total	FC	Stand	Right	Total	FC	Stand	Right
1980	162	157	2	3	87	86	0	1	75	71	2	2
1981	152	149	1	2	64	63	0	1	88	86	1	1
1963–1981	1,249	1,057	134	57	473	401	43	29	776	656	92	28
1982–2003	8,708	8,375	333[b]	–	8,241	7,912	329[b]	–	467	463	4[b]	

[a]The information is from Stevenson (1957) (1935–1955), Eckbo and Masulis (1992) (1963–1981), and SDC (1982–2003). Stevenson (1957) lists common stock issues with proceeds over $1 million appearing in Sullivan and Cromwell Issuer Summaries 1933–1950 and in The Commercial and Financial Chronicle 1950–1955. Eckbo and Masulis (1992) base their sample on the Wall Street Journal Index, the Investment Dealer's Digest, and Moody's Industrials and Utilities Manuals. Their sample excludes simultaneous offers of debt/preferred stock/warrants, combination primary/secondary stock offerings, cancelled or postponed offers, and non-U.S. issues. The SDC sample shown for the period 1982–2003 includes issues on exchanges other than NYSE and AMEX.

[b]The SDC does not provide sufficient information to separate uninsured rights offerings from rights with standby underwriting. Thus, all rights are reported under the standby category in this table.

to standbys over the past two decades. A similar time trend is evident in the study of French SEOs by Gajewski and Ginglinger (2002).[23] Overall, as concluded by Eckbo and Masulis (1995) and Armitage (1998) as well, there appears to be an international trend away from rights. This trend coincides with substantial growth in listed firms' total equity size.

As discussed in Section 3 above, the uninsured rights method has by far the lowest direct costs. Thus, it appears that issuers in the U.S. and increasingly elsewhere are selecting the most expensive equity flotation method. Therein lies the rights offer paradox. Resolution of the paradox requires identifying indirect costs of rights that are of sufficient economic magnitude to make the total (direct and indirect) costs of firm commitment offerings the lowest for nearly all large, publicly traded industrial issuers in the U.S. We identified some of these indirect costs in Section 3. Eckbo and Masulis (1992) argue that a potentially large indirect cost emanates from adverse selection in the rights issue market. We discuss why information asymmetries may drive issuers away from the rights method next.

[23] Cronqvist and Nilsson (2005) report that uninsured rights are more frequent than uninsured rights over their sample period but do not show the time trend.

Table 11
Equity security issues by firms listed on the Tokyo Stock Exchange, 1956–2003[a]

Year	Rights offerings		Public offerings		Preferred stocks		Private placements		Exercise of warrants		Total	
	No. of issues	Amount raised (¥ bils.)	No. of issues	Amount raised (¥ bils.)	No. of issues	Amount raised (¥ bils.)	No. of issues	Amount raised (¥ bils.)	No. of issues	Amount raised (¥ bils.)	No. of issues	Amount raised (¥ bils.)
1956	294	157	36	4	–	–	11	2	–	–	341	164
1957	292	199	40	5	–	–	10	1	–	–	342	205
1958	147	160	30	5	–	–	3	0	–	–	180	165
1959	158	153	60	10	–	–	3	0	–	–	211	183
1960	275	331	100	35	–	–	4	1	–	–	379	387
1961	465	632	224	80	1	0.4	6	1	–	–	695	712
1962	554	587	171	20	–	–	9	3	–	–	734	609
1963	508	410	157	38	–	–	8	7	–	–	673	453
1964	434	623	85	4	–	–	14	3	–	–	533	631
1965	95	115	19	1	–	–	8	3	–	–	122	117
1966	173	202	34	1	–	–	24	8	–	–	231	212
1967	190	194	68	5	–	–	13	4	–	–	261	202
1968	201	303	80	10	–	–	12	2	–	–	293	315
1969	300	447	145	55	–	–	14	5	–	–	469	506
1970	316	538	203	138	–	–	18	5	–	–	537	681
1971	220	409	147	84	–	–	24	44	–	–	391	637
1972	180	284	275	665	–	–	43	92	–	–	498	1,041
1973	177	344	256	565	–	–	45	30	–	–	478	939
1974	214	244	193	277	–	–	31	23	–	–	438	544
1975	166	771	103	222	–	–	16	8	–	–	285	1,001

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Table 11
(*Continued*)

Year	Rights offerings		Public offerings		Preferred stocks		Private placements		Exercise of warrants		Total	
	No. of issues	Amount raised (¥ bils.)	No. of issues	Amount raised (¥ bils.)	No. of issues	Amount raised (¥ bils.)	No. of issues	Amount raised (¥ bils.)	No. of issues	Amount raised (¥ bils.)	No. of issues	Amount raised (¥ bils.)
1976	102	180	181	500	1	12	11	9	–	–	294	689
1977	120	291	238	604	–	–	48	29	–	–	406	923
1978	86	267	195	565	–	–	62	84	–	–	313	897
1979	64	262	229	629	–	–	42	63	–	–	325	953
1980	34	90	218	881	–	–	28	81	–	–	280	1,052
1981	67	494	249	1,396	–	–	20	37	–	–	336	1,928
1982	45	224	209	1,103	1	30	14	21	4	2	272	1,349
1983	18	135	72	472	–	–	23	165	18	30	131	802
1984	23	91	128	821	1	6	18	68	39	66	208	1,043
1985	40	183	103	506	–	–	18	33	70	137	231	859
1986	27	69	76	400	–	–	18	30	118	373	235	673
1987	26	436	99	1,394	–	–	22	109	241	1,074	388	3,013
1988	40	787	157	2,582	–	–	23	104	316	1,309	536	4,782
1989	32	726	227	5,830	–	–	22	102	436	2,190	718	8,849
1990	39	825	121	1,975	–	–	21	315	397	678	578	3,792
1991	40	218	27	126	–	–	19	104	309	360	395	808
1992	20	111	3	4	–	–	22	102	127	203	172	420
1993	9	48	4	7	–	–	14	150	184	617	211	823
1994	2	10	17	137	1	100	8	239	180	451	208	936
1995	12	96	8	33	1	50	19	160	118	299	158	638

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Table 11
(*Continued*)

Year	Rights offerings		Public offerings		Preferred stocks		Private placements		Exercise of warrants		Total	
	No. of issues	Amount raised (¥ bils.)	No. of issues	Amount raised (¥ bils.)	No. of issues	Amount raised (¥ bils.)	No. of issues	Amount raised (¥ bils.)	No. of issues	Amount raised (¥ bils.)	No. of issues	Amount raised (¥ bils.)
1996	9	337	36	305	5	539	20	219	187	674	257	2,074
1997	9	73	26	128	2	224	19	370	88	368	144	1,162
1998	1	0.3	12	284	5	471	35	696	35	88	88	1,540
1999	–	–	35	371	27	7,012	86	2,445	74	262	222	10,090
2000	2	8	36	573	5	137	56	972	94	111	193	1,798
2001	3	32	18	1,201	6	228	71	567	92	38	190	2,067
2002	–	–	21	156	40	1,029	79	502	82	276	222	1,963
2003	3	2	40	573	75	2,537	103	234	126	40	347	3,385
2004	4	4	80	754	55	1,411	142	624	241	104	522	2,900

Source: The Tokyo Stock Exchange Fact Book, 2005.
[a]The table includes foreign issues.

4.2. Adverse selection and current shareholder takeup

Myers and Majluf (1984) provide the first analytical approach to the equity issue decision under asymmetric information. It is useful to recap the setting of their primary model:

- The firm's objective is to maximize the full-information (long-run) value of current shareholders' claim on the firm.
- The firm knows the true value a of its assets in place while outside investors know only the probability distribution over a.
- The firm needs to sell equity to raise a cash amount of I dollars in order to finance a short-lived investment project with a commonly known net present value of b.
- The equity issue is sold using a simple flotation method: a direct offering to the public with no mechanism (such as an underwriter) for communication between the issuer and outside investors, and with no participation in the issue by current shareholders.

A key insight of Myers and Majluf (1984) is that the cost of selling undervalued stock may exceed b, causing the undervalued firm to forego the investment project rather than issue and invest.[24] The cost of this underinvestment drives a demand for more expensive flotation methods designed to reduce the information asymmetry between the issuer and outside investors. The cost may also induce the firm to turn to its own shareholders for additional equity capital. In sum, the Myers and Majluf (1984) setting provide a useful starting point for thinking about how undervalued firms may use alternative flotation methods to reduce costly information asymmetry.

For example, Wruck (1989) and Herzel and Smith (1993) suggest that some high-quality issuers avoid public issues in favor of private placements. In a private placement, the issuer may directly compensate the investor for costs of due diligence and quality inspection by selling the issue at a discount relative to the issue's market price. If the private placement investor holds on to the newly created block of shares, there may also be long-term benefits in terms of increased monitoring of the issuing firm's management.[25] Firms may also turn to underwriters for quality certification. Baron (1982), Booth and Smith (1986), Beatty and Ritter (1986), Titman and Trueman (1986) and Eckbo and Masulis (1992) all presume that underwriters have some ability and incentive to evaluate the extent to which the issuer's stock may be overpriced, and to avoid selling overpriced shares to the public. The incentive may emanate from an underwriter's risk of loss of reputation, or its risk of legal liability (e.g., Tinic, 1988; Blackwell, Marr, and Spivey, 1990).

[24] Dybvig and Zender (1991) argue that an appropriately structured managerial compensation contract would eliminate this underinvestment problem. Similarly, Admati and Pfleiderer (1994) point out that in a firm that has only investors who hold a fixed fraction of all its securities, management seeks to maximize shareholder wealth by always investing in positive NPV projects.

[25] It may also be the case that entrenched managers prefer a private placement. The offering price discount may be used as compensation to a friendly "white knight" investor for allowing management to maintain private benefits of control (see also Zwiebel, 1995). We return to this issue below.

Eckbo and Masulis (1992) generalize the Myers–Majluf framework by explicitly allowing current shareholder participation in the issue via a rights offer. Moreover, they introduce noisy but informative quality certification in the form of underwriting (standbys or firm commitment contracts). These refinements allow a realistic representation of the most commonly used flotation methods, and they result in a number of interesting predictions not available from Myers and Majluf (1984). In particular, as discussed in more detail in the subsequent section, the set of circumstances in which one expects a negative market reaction to equity issue announcements is considerably smaller.

To illustrate the shareholder takeup model, let $k \in [1, 0]$ denote the exogenously given and observable fraction of the issue that is taken up by current shareholders.[26] Moreover, let $C(k)$ denote total issue costs, which is the sum of direct costs d and expected wealth transfer to outside investors. As in Eckbo and Norli (2004), the expected profits π from issuing and investing can be written

$$\begin{aligned}\pi &= b - C(k)\\ &= b - d - \frac{I(1-k)\left[(a+b+I-d) - P\right]}{P},\end{aligned} \tag{1}$$

where P is the post-issue secondary market price of the issuer. P is determined by investors' equilibrium beliefs about a. In a separating equilibrium, P equals the full-information value of the post-issue company ($P = a + b + I - d$), with issue profits of $\pi = b - d$. In a pooling equilibrium, however, undervalued firms experience a positive wealth transfer as $P < a + b + I - d$.[27]

Equation (1) shows how the magnitude of any wealth transfer cost is attenuated by shareholder takeup k. Essentially, shareholder takeup acts like a form of financial slack. If $k = 1$, $\pi = b - d$ and the wealth transfer cost is zero, even if the market undervalues the stock ($P < a + b + I - d$). If $k < 1$, which means that some shareholders in a rights offer will sell their rights to outside investors rather than subscribe, adverse selection costs are positive for undervalued firms *even if the rights offer is expected to be fully subscribed in the end*. If the firm uses an uninsured rights offer when $k = 0$, current shareholders sell *all* the rights, and the entire issue is sold to outside investors. This is a worst-case scenario in terms of wealth-transfer costs: since there is no quality certification, uninsured rights generate the same potential for wealth transfers associated with the direct offer mechanism in Myers and Majluf (1984).

Eckbo and Masulis (1992) argue that their shareholder takeup model resolves the rights offer paradox: high-quality issuers gravitate towards flotation methods that minimize the potential for wealth transfer costs. Their key insight is to show that the wealth

[26] Because the fraction k reflects individual shareholder wealth constraints, it is in part exogenous to the firm. k is observable through subscription precommitments (published in the issue prospectus), and through the rights trading activity (trades occur when current shareholder do not want to participate).

[27] As discussed in Eckbo and Norli (2004), the profit function in equation (1) presumes that the offering price P_0 is set consistent with market beliefs $P_0 = P$. Thus, this function ignores the possibility of using an offering price discount to convey information. We return to the offering discount below.

transfer cost associated with an uninsured rights offer increases as k decreases. eventually making it optimal to add quality certification in a standby offering. As k approaches zero, it is optimal to abandon rights altogether, despite the low *direct* cost of rights. In sum, the optimal flotation method choice depends on k. It follows that, around the world, firms gradually avoid uninsured rights in response to a gradual reduction in the willingness of wealth-constrained shareholders to keep funding corporate growth. This is consistent with the time-trend away from uninsured rights evidenced in Table 10 and Table 11, as average firm size also increases over time. It is also consistent with the fact that smaller private firms, and firms listed on smaller international stock exchanges, still use rights today.

Under the shareholder takeup model of Eckbo and Masulis (1992), the cross-sectional variation in the use of rights is driven by factors that affect individual shareholders wealth constraints and incentives. These factors include personal wealth and degree of risk aversion, the magnitude of private benefits of control, and the availability of substitute mechanisms for maintaining control benefits (e.g., restricted voting share and pyramidal ownership structures). Regulatory changes, and changes in the issue-technology also plays a role. For example, Ursel and Trepanier (2001) present some evidence that the decline in Canadian rights issues to some extent coincides with regulatory changes—such as the expanded use of short-form prospectuses and shelf registration procedures—which lead to an increase in the relative costs of rights.

Eckbo and Norli (2004) extend the analysis of Eckbo and Masulis (1992) by formalizing a sequential, multistage issue game in which issuers at each stage have access to a menu of flotation methods. At the start of the game, issuer have access to uninsured rights, rights with standby underwriting, and private placements.[28] Consistent with the evidence in Table 6, the direct issue cost d is assumed to be lowest for uninsured rights. The standby underwriter and private placement investor perform noisy but informative quality certification. If, say, the private placement investor rejects purchasing the issuer based on its private evaluation, then the issuer either decides not to issue or moves on and decides between the remaining flotation methods in the next issue subgame. Thus, firms select among entire issue *strategies* and not just among individual flotation methods.

Eckbo and Norli (2004) show that there exists an equilibrium 'pecking order' of flotation methods in their issue game which depends on k. Figure 3 illustrates with a numerical example this pecking order.[29] The horizontal axis plots shareholder takeup k. The vertical axis plots total expected issue cost $C(k)$ for each of three alternative issue strategies. $C(k)$—which is linear in k—incorporates the issuer's participation constraint (equation (1) above), so these are equilibrium strategies. Denote a particular issue strategy as $\{x\}$. The steepest line in Figure 3 is for the "move straight to uninsured rights and

[28] One could substitute firm commitment underwriting for private placement without altering the basic model insights. Eckbo and Norli (2004) use private placements as their empirical laboratory is the Oslo Stock Exchange where uninsured rights, standby rights and private placements are the only observed flotation methods.

[29] See the Appendix of (Eckbo and Norli, 2004) for details of the parameter values.

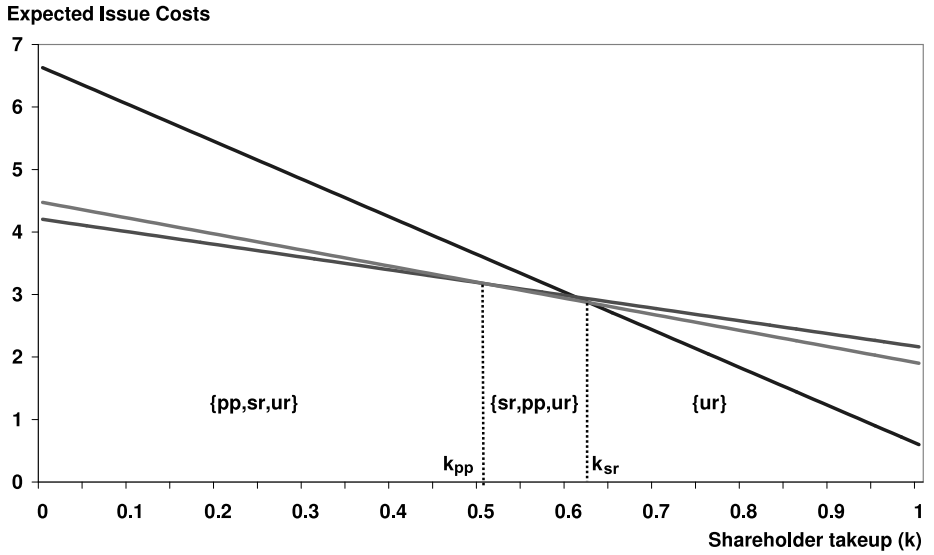

Fig. 3. Illustration of the flotation method pecking order. Source: Eckbo and Norli (2004). The horizontal axis plots shareholder takeup k. The vertical axis plots total expected issue cost $C(k)$ for each of three alternative issue strategies. $C(k)$ incorporates the issuer's participation constraint. The steepest line is $C(k)$ for the "move straight to uninsured rights and issue" strategy $\{ur\}$. The middle line is $C(k)$ for the strategy "start with standby rights, and if rejected try private placement, and if rejected again, sell the issue using uninsured rights" $\{sr, pp, ur\}$. The third and most horizontal line is $C(k)$ for the "start with a private placement, and if rejected try a standby rights, and if rejected again, sell the issue using uninsured rights" strategy $\{pp, sr, ur\}$. The critical values of k are denoted k_{pp} and k_{sr}. The optimal issue strategy is one that minimizes $C(k)$ conditional on k, i.e., the inner envelope of the three separate cost curves. Thus, it is an equilibrium for all issuers with shareholder takeup less than the critical value of $k_{pp} = 0.51$ to attempt a private placement first. When k is between $k_{pp} = 0.51$ and $k_{sr} = 0.62$, the equilibrium strategy is to attempt a standby rights offering first, while all issuers with k greater than $k_{sr} = 0.62$ go directly to the uninsured rights offer.

issue" strategy $\{ur\}$. The middle line is for the strategy "start with standby rights, and if rejected try private placements, and if rejected again issue using uninsured rights" $\{sr, pp, ur\}$. The third and most horizontal line is for the strategy "start with private placement, and if rejected try standby rights, and if rejected again issue using uninsured rights" $\{pp, sr, ur\}$. The critical values of k that separates these strategies are denoted k_{pp} and k_{sr}. The optimal issue strategy is one that minimizes $C(k)$, i.e., the inner envelope of the three separate cost curves. Thus, in Figure 3, it is an equilibrium for all issuers with shareholder takeup less than the critical value of $k_{pp} = 0.51$ to attempt a private placement first. When k is between $k_{pp} = 0.51$ and $k_{sr} = 0.62$, the equilibrium strategy is to attempt a standby rights offering first, while all issuers with k greater than $k_{sr} = 0.62$ go directly to the uninsured rights offer.

A central implication of this pecking order is that the probability of an issuer switching from rights to underwritten offer increases as k decreases even if a rights offer is

expected to be fully subscribed with the help of outside investors. There is growing evidence to support this prediction. Eckbo and Masulis (1992) and Singh (1997) report that the average level of shareholder takeup in U.S. rights offers is greater in uninsured rights offers than in standbys. Eckbo and Masulis (1992) also find that firms obtain substantial levels of subscription precommitments from large shareholders prior to selecting the uninsured rights method, with few such precommitments in standby rights. Information on subscription precommitments are published in the offering prospectus and are empirically useful in predicting k. As reviewed in Section 3 above, there is also substantial evidence more generally that flotation costs are lower for firms with greater ownership concentration, which are also the firms that tend to have greater values for k.

Internationally, where the rights method is much more prevalent, there is also substantial evidence consistent with a key role for shareholder takeup k. Bøhren, Eckbo, and Michalsen (1997) and Cronqvist and Nilsson (2005) study rights offers on the Oslo and Stockholm stock exchanges, respectively, and use the trading volume in rights to directly measure k.[30] They find that rights are more likely to be selected the greater the value of k. Moreover, Bøhren, Eckbo, and Michalsen (1997) show that the probability of switching from uninsured rights to standby rights declines with k, as predicted by Eckbo and Masulis (1992) and Eckbo and Norli (2004). Slovin, Sushka, and Lai (2000) find that the level of subscription levels is similar in standbys and uninsured rights in the U.K.[31] In their sample of French SEOs, Gajewski and Ginglinger (2002) report a greater ownership concentration for uninsured rights issuers than for standby rights issuers, and the lowest ownership concentration for underwritten public offerings. They also report that share allocations not taken up by the issuer's blockholders is much larger for underwritten public offerings than for uninsured rights and standbys. Using annual data on share ownership in Italy, Bigelli (1998) report that insiders' level of shareownership remains stable through the year of a rights offering, which is consistent with a high value of k.

4.3. Predicting the market reaction to issue announcements

Table 12 summarizes the empirical predictions of the adverse selection, shareholder takeup and pecking order theories for the stock market reaction to issue announcements as a function of the flotation method. Table 12 is restricted to models in which the firm considers issuing common stock only. The choice between different types of securities—the capital structure choice—is covered in several other chapters throughout this Handbook, and has also been previously reviewed by Harris and Raviv (1991).

Let AR denote the announcement-induced abnormal stock return of the issuer. We first discuss predictions for AR of models with only a *single* flotation method, of which Myers and Majluf (1984) is the most prominent. These models provide a useful starting

[30] Rights are traded on stock exchanges. If rights trade only once (sold by a current shareholder to an outside investor), then the trading volume in rights measure $1 - k$ directly.

[31] However, it is not clear from their study whether their "takeup" variable reflects total rights-subscription levels or only subscriptions by current shareholders.

Table 12
Predicted market reaction *AR* to SEO announcements as a function of the flotation method choice

Study	Model specifics	Model implications for *AR*
Myers and Majluf (1984)	Direct sale to public with no communication between firm and market. Current shareholders are passive bystanders to issue (they neither purchase new nor sell old shares). Managers maximize current shareholders' claim on firm, which amounts to maximizing the intrinsic (full-information) value of this claim	Separating equilibrium: $AR_{do} < 0$. Ceteris paribus, AR_{do} is more negative the greater the risk that the security is overvalued by market prior to the issue announcement. A pooling equilibrium ($AR_{do} = 0$) is more likely the greater the ratio $b/E(a)$
Krasker (1986)	Myers and Majluf (1984) but with varying investment size I	In the separating equilibrium, $AR_{do} < 0$ and more negative the greater is I
Heinkel and Schwartz (1986)	Issuers choose between uninsured rights, standbys and firm commitment offerings. Standbys is the most expensive flotation method and provide perfect quality *certification*. Firm commitment is simply a direct sale to market with no certification	Highest-quality issuers select standbys, intermediate-quality issuer select uninsured rights, while lowest quality issuers select firm commitments. $AR_{fc} < AR_{ur} < 0$ and $AR_{sr} > 0$
Giammarino and Lewis (1988)	Myers and Majluf (1984) but with an intermediary 'financier' who may reject the issue	Semi-separating equilibrium with $AR_{fc} > 0$
Eckbo and Masulis (1992)	Myers and Majluf (1984) but allowing current shareholder takeup of the (exogenous) fraction k of the issue, and informative but noisy quality certification by underwriters. Single-stage flotation method game	Optimal flotation method choice depends on k: Separating equilibrium where no low-k firms select uninsured rights. Adverse selection greatest for firm commitments, lowest for uninsured rights, with standbys in between: $AR_{fc} < AR_{sr} < AR_{ur} \leqslant 0$
Cooney and Kalay (1993); Wu and Wang (2005, 2006a)	Myers and Majluf (1984) but with possible managerial overinvestment ($b < 0$)	Separating equilibrium with $AR_{do} > 0$ due to prior market uncertainty about $b < 0$
Bøhren, Eckbo, and Michalsen (1997)	Eckbo and Masulis (1992) with uninsured rights and standbys only, but with varying underwriter quality certification ("effectiveness")	High-k issuers select uninsured rights regardless of firm quality, so no adverse selection ($AR_{sr} = 0$). Adverse selection in standbys if underwriter "ineffective" ($AR_{sr} < 0$), but positive selection if underwriter "effective" ($AR_{sr} > 0$)

(*Continued on next page*)

Table 12
(*Continued*)

Study	Model specifics	Model implications for *AR*
Eckbo and Norli (2004)	Eckbo and Masulis (1992) but with a multistage issue game. Private placement replaces firm commitments. If issuer is rejected by the private placement investor or the standby underwriter, it moves to the next subgame consisting of the remaining flotation method choices	Equilibrium where issuers pool over entire issue *strategies*, but where some issuers are rejected by the noisy quality inspection. High-k firms prefer the issue strategy $\{ur\}$ which implies $\{AR_{ur} = 0\}$. Intermediate-k firms prefer the strategy $\{sr, pp, ur\}$ which implies $\{AR_{sr} > 0, AR_{pp} = 0, AR_{ur} < 0\}$. Low-$k$ issuers prefer $\{pp, sr, ur\}$ implying $\{AR_{pp} > 0, AR_{sr} = 0, AR_{ur} < 0\}$

In all the models below, the firm knows the true value of its assets in place a while shareholders and outside investors only know the probability distribution over a. The firm needs to sell equity (no debt allowed) to raise the amount I required to invest in a short-lived project with net present value b. The models differ in their assumptions about managerial objectives and availability of flotation methods. AR_{do}, AR_{ur}, AR_{sr}, AR_{fc}, AR_{pp} denote the market reactions to "direct offering", "uninsured rights", "standby rights", "firm commitment", and "private placement", respectively. In Eckbo and Norli (2004), an issue strategy such as the one denoted $\{pp, sr, ur\}$ means "try private placement first, if rejected, try standby rights, if rejected again, do uninsured rights".

point for understanding the effects of adverse selection per se. We then turn to models where the firm is allowed to select from a menu of commonly used flotation methods, either in single-stage or in multi-stage (sequential) games.

4.3.1. Models with a single flotation method

Recall that the setting of Myers and Majluf (1984) is a direct equity sale to the public. Current shareholders are assumed to be passive and there are no mechanism for quality certification. In their separating equilibrium, some undervalued firms prefer not to sell shares, which implies that the pool of issuing firms is overpriced ex ante. The market therefore discounts issuers' stock price in response to news of the offer ($AR < 0$). Alternatively, in their pooling equilibrium, the value of b is sufficiently large for all firms to issue, which implies that the issue announcement conveys no new information to the market ($AR = 0$). Ceteris paribus, in their separating equilibrium, AR is more negative the greater the ex ante risk that the security is overvalued by the market. The latter implication helps distinguish the Myers and Majluf (1984) adverse selection model from a signaling model such as Miller and Rock (1985), in which external financing conveys negative information per se, regardless of the potential for security mispricing.

Strictly speaking, tests of the Myers and Majluf (1984) prediction $AR \leqslant 0$ requires a sample of direct equity sales to the public. As direct sales are rare events, no such experiment has been reported to date. Existing studies draw from the set of available flotation methods, which in U.S. studies is predominantly firm commitment offerings, while rights offerings dominate throughout the rest of the world. The subsequent theoretical work represents attempts to refine the single-flotation-method environment of Myers and Majluf (1984) in various ways, adding predictive power in samples dominated by more complex flotation methods.

Krasker (1986) allows the size of the investment project—and therefore the required financing amount I—to vary across firms. He derives a separating equilibrium in which greater amounts I implies greater adverse selection, so AR is more negative the greater the amount raised in the offering.

Giammarino and Lewis (1988) introduces a simple bargaining game between the issuer and an uninformed financial intermediary. The purpose is to examine the implications of allowing the purchaser of the issue to reject the offering (which never happens in Myers and Majluf (1984)). The issuer suggests an offer price that is either "high" or "low", and the financier accepts or rejects the offer. In their semi-pooling equilibrium, the high-value type always suggests a high offer price, while the financier randomizes between accepting and rejecting the high offer price, but always accepts a low offer price. The information content of the issue announcement depends on which issuer type is most eager to finance the project, measured by the ratio of assets in place to post-issue value. If the low-value type is more eager, it will find a way to avoid being rejected too often by the financier. This is accomplished by randomizing between the low price (which is always accepted by the financier) and the high price. In this equilibrium, the low-value type ends up being revealed in the separating part of the equilibrium, so $AR < 0$. Conversely, when the high-value type is relatively more eager to obtain financing, the equilibrium implies $AR > 0$. This latter equilibrium does not exist in a setting such as Myers and Majluf (1984) where b is constant across issue types, since then the low-value type will always be the most eager to obtain financing.

Cooney and Kalay (1993) and Wu and Wang (2005, 2006a) allow managers to overinvest ($b < 0$). In Cooney and Kalay (1993), it is possible for a firm with overvalued stock to issue stock to invest in negative NPV projects, while a firm with undervalued stock may still issue stock to avoid loosing very profitable NPV investment opportunities. Thus, in their model equity issuance has two effects, a negative signal about current assets in place and a positive signal about new investment opportunities, where either effect can dominate. In Wu and Wang (2005, 2006a) the overinvestment is introduced by explicitly assuming that managers enjoy a certain level of private benefits of control. In both papers, there is ex ante uncertainty about whether or not an issuer will try to fund a negative NPV project. They show that this type of uncertainty may produce a positive equilibrium market reaction to some equity issues. The positive reaction reflects the surprise when firms issue to fund projects with a greater value of b than expected.

The following numerical example illustrates a positive issue surprise effect by simply adding the shareholder takeup parameter k to the original Myers and Majluf (1984) model. Suppose the market does not know k ex ante, but believes that $k = 0$. Moreover, it is common knowledge that the firm's assets in place a may be in one of two equally likely states: "high" with $a = \$150$ or "low" with $a = 50$. In both states, the project NPV is $b = 20$. With $k = 0$ (which means we are back in the Myers–Majluf model), it follows that the firm in this example will only issue if it is in the low state.[32] This implies a pre-issue stock price p^- which reflects an underinvestment discount (capitalizing the value of the project only in the low state): $p^- = (150 \times 0.5 + (50 + 20) \times 0.5) = \$110$. If the firm announces a stock issue and reveals $k = 0$, the post-issue price will be $p^+ = (50 + 20) = \$70$. In this case, the firm sells the fraction $(100/210) \times 100 = 48\%$ of the firm in order to raise \$100, generating a market reaction of $AR = 100 \times (70 - 110)/110 = -36\%$.

However, suppose the issuer surprises the market by revealing $k = 1$ through the offering process. Since $k = 1$ implies that the firm prefers to issue in both states (there is no wealth transfer to outside investors), there is pooling and the issue announcement carries no information about the true state. Still, the announcement causes the market to eliminate the underinvestment discount, now capitalizing the value of the project in *both* states: $p^+ = \$120$ and $AR = 9\%$. In this example, new information revealing a high value of k reverses market expectations from a separating equilibrium to a pooling equilibrium, resulting in $AR > 0$.

It is clear from the above that the implied market reaction to issue announcements may be negative, zero, or positive in information settings that represent simple refinements of the original Myers and Majluf (1984) setup—even when preserving their single flotation method environment. We next describe predictions emanating from models allowing for a choice between several flotation methods.

4.3.2. Modelling the flotation method choice

In the first model of the flotation method choice, Heinkel and Schwartz (1986) allow issuers to choose between uninsured rights, standby rights and 'firm commitment' offerings. In their model, uninsured rights carry a risk of offering failure, while standby rights and firm commitment offers fully guarantee the offering proceeds. The standby underwriter fully reveals the issuer type while the firm commitment underwriter is uninformed. In equilibrium, the highest-valued issuers select standbys, intermediate-value issuer select uninsured rights, while the lowest-valued issuers select firm commitment offers. Thus, this model predicts $AR_{fc} < AR_{ur} < 0$ and $AR_{sr} > 0$.

In the Heinkel and Schwartz (1986) model, the quality certification in a standby rights offer makes this a more expensive flotation method than firm commitment offerings,

[32] Note that $k = 0$ still means that the firm could put on a fully subscribed rights offer. However, in such a rights offer, every subscriber would be a new shareholder.

which is counterfactual (Table 6). Moreover, there is no explicit role for current shareholder takeup. Eckbo and Masulis (1992) offers a menu of flotation methods which allows shareholder takeup (k) and informative but noisy quality certification by underwriters in both standbys and firm commitment offerings. As discussed above (equation (1)), shareholder takeup reduces the size of the offering to outside investors, acting like financial slack in Myers and Majluf (1984). In equilibrium, high-k firms select uninsured rights with little or no adverse selection, intermediate-k firms select standby rights, while low-k firms select firm commitments. They predict that $AR_{fc} < AR_{sr} < 0$ and that $AR_{ur} \approx 0$.

Building on Eckbo and Masulis (1992), Bøhren, Eckbo, and Michalsen (1997) model two flotation methods: uninsured rights and standbys. They refine the empirical prediction on announcement returns by varying the effectiveness of the underwriter in detecting overpriced issues. As in Eckbo and Masulis (1992) all high-k issuers select uninsured rights which results in $AR \approx 0$. Moreover, in an equilibrium with "ineffective" underwriter certification, some overvalued issuers decide to risk the certification process, leading to adverse selection in the pool of low-k firms selecting standby rights offerings, so $AR_{sr} < 0$. However, in an equilibrium with "effective" underwriters some low-k firms prefer not to issue rather than risk being detected by the quality certification process, so the standby pool exhibits positive selection and $AR > 0$.

Eckbo and Norli (2004) is the first model to allow a sequential flotation method choice. As discussed above, they prove the existence of a sequential pooling equilibrium in which issuers pool over entire issue strategies. Pooling results when the issue profits π in equation (1) is non-negative for both high-value and low-value firms. The issue methods are private placement, standby rights and uninsured rights. Both the private placement investor and the standby underwriter perform an informative but noisy quality inspection and may reject the issue. Recall the definition of an issue strategy, e.g., $\{pp, sr, ur\}$ which means "try a private placement first, if rejected try standby rights, and if rejected again do an uninsured rights offer". Although issuers pool over issue *strategies*, they may eventually end up using different flotation methods due to randomness in the quality inspection process. The predictions for the market reaction are as follows:

Eckbo and Norli (2004)—Pecking order. *Suppose k is known ex ante and that issuers follow the pecking order illustrated in Figure 3. Let "high k" mean $k \in [k_{sr}, 1]$, "medium k" mean $k \in [k_{pp}, k_{sr}]$ and "low k" mean $k \in [0,\ k_{pp}]$. It is part of a sequential pooling equilibrium for high-k issuers to select the strategy $\{ur\}$, for medium-k issuers to select the strategy $\{sr, pp, ur\}$ and for low-k issuers to choose $\{pp, sr, ur\}$. The associated market reaction AR to the issue announcement is as follows*:

	k high	k medium	k low
Uninsured rights:	$AR_{ur} = 0$	$AR_{ur} < 0$	$AR_{ur} < 0$
Standby rights:	off-equilibrium	$AR_{sr} > 0$	$AR_{sr} = 0$
Private placement:	off-equilibrium	$AR_{pp} = 0$	$AR_{pp} > 0$

The intuition behind these predictions for *AR* is as follows. Starting with the first line (uninsured rights), firms with high k prefer to issue using the relatively low-cost uninsured rights method. Since there is no inspection, there is also no information conveyed by the issue decision, thus $AR_{ur} = 0$. Firms with medium and low k values prefer quality inspection (Figure 3). Thus, issuers of uninsured rights with medium or low k have necessarily been rejected twice by the inspection, so $AR_{ur} < 0$.

Second, in the line for the standby rights method, medium-k issuers prefer standbys, creating a positive market reaction ($AR_{sr} > 0$) due to the positive inspection result. Low-k issuers prefer private placement (Figure 3). Thus, low-k issuers that issue using standbys have been rejected by the private placement inspection before accepted by the standby underwriter inspection. From the market's point of view, these two inspection results cancel out, so there is no new information and $AR_{sr} = 0$. Similarly, in the line for the private placement method, medium-k issuers that use private placement have first been rejected by the standby underwriter, thus $AR_{pp} = 0$. Low-k issuers prefer private placement (Figure 3), so the successful inspection result implies $AR_{pp} > 0$.

We now turn to a summary of the international evidence on SEO announcement returns, and then draw inferences about the theoretical predictions above.

4.4. Evidence on issue announcement returns

Abnormal returns are typically measured over the two-day window $[-1, 0]$ ending with the public announcement date (day 0), or over the three-day window $[-1, +1]$. Abnormal return to issuer i on day t is typically defined using a simple market model:

$$\gamma_{it} \equiv r_{it} - E(r_{it}) = r_{it} - (\alpha_i + \beta_i r_{mt}), \tag{2}$$

where r_{it} is the daily stock return in excess of the risk-free rate, r_{mt} is the daily excess return on the value-weighted CRSP market return, and α and β are estimated during some pre-event period. For event windows containing multiple periods, the cumulative abnormal return is found by adding daily abnormal returns. With the market model estimation, it is important not to "contaminate" the estimate of α with the well-known average stock price runup over the year prior to the typical U.S. stock issue. If this runup is treated as "normal" then the estimate of α will be overstated, resulting in a downward bias in the estimated abnormal return γ. One solution to this problem is to estimate the market model parameters using post-issue stock returns.

Some studies estimate γ directly by means of a conditional market model,

$$r_{it} = \alpha_i + \beta_i r_{mt} + \gamma_i d_t + \epsilon_{it}, \tag{3}$$

where d_{it} is a dummy variable that takes on a value of 1 during the event window and zero otherwise, and ϵ_{it} is the regression error term. If the event dummy d_t takes on a value of one over ω days in the event window, then the cumulative abnormal return over the event window is $\omega\gamma_i$.[33]

[33] See Thompson (1985, 1995) for details of this event-study approach.

The studies form average abnormal returns across a sample of N issues as $AR_t \equiv (1/N)\sum_i^N \gamma_{it}$ and report tests of the hypothesis that $AR_t = 0$. Statistical significance is inferred using either a t-statistic for the average, or a z-statistic

$$z_t = \frac{1}{\sqrt{N}} \sum_{j=1}^{N} \frac{\gamma_{it}}{\sigma_i}, \tag{4}$$

where σ_i is the time series estimate of the standard error of γ_{it}.[34] For large sample size N, this z-statistic has a standard normal distribution under the null hypothesis of a zero average abnormal return.

We have organized the evidence on average announcement effects to security offerings in three tables. Table 13 covers studies of SEOs by U.S. firms, classified by the flotation method. Table 14 show international evidence on SEOs, again by flotation methods. We separate U.S. from international studies as the international evidence show very different results than that of U.S. studies. Third, Table 15 show the announcement effect of straight and convertible debt offerings by U.S. firms.

4.4.1. Market reaction to SEOs in the U.S.

In this section, we highlight four main conclusions from the U.S. evidence. As surveyed by Eckbo and Masulis (1995), the perhaps most striking finding of papers published in the 1980s is the significantly negative market reaction to firm commitment offerings by U.S. firms. These papers are shown in Panel (a) of Table 13. For brevity, the table pools results for industrial and utility issuers—although it is well known that the market reaction to industrial issuers is more negative than for utility offerings. For example, while the two-day average abnormal return averages about -2% across the two issuer types (using sample-size weights), it averages about -3% for industrials and -1% for utilities (Asquith and Mullins, 1986; Masulis and Korwar, 1986; Mikkelson and Partch, 1986; Korajczyk, Lucas, and McDonald, 1990; Hansen and Crutchley, 1990; Eckbo and Masulis, 1992). The lower market reaction to utilities is consistent with adverse selection arguments as utilities generally have less discretion than industrial companies in timing the issue to short-term overvaluation. The regulatory process reduces discretion to time the market, either by slowing the issue approval process or by forcing the firm to issue at times determined in part by the incentives of the regulator.

In 1985, the Wall Street Journal changed its reporting system for SEO announcements with the effect of making it more costly to collect accurate issue announcement dates for broad, representative samples.[35] This, combined with the very strong inferences made from the earlier studies, probably explains why there is a drop in the

[34] Some studies report t-statistics using a cross-sectional estimate of the standard error. See Kothari and Warner (2007), Chapter 1 of this volume, for a discussion of various event-study procedures.

[35] Jung, Kim, and Stulz (1996): "Before 1985, the WSJ reports on equity issues as a regular news item. From 1985, most of the information on new issues is reported in the 'new securities issues column' which

Table 13
Average market reaction (*AR*, %) to announcements of seasoned equity offerings (SEOs) by U.S. firms, classified by flotation method

Study	Sample size	Sample period	*AR* (%)
(a) Firm commitments: $N = 15{,}017$; $AR_{fc} = -2.22^*$			
Asquith and Mullins (1986)	392	1963–1981	−1.6*
Masulis and Korwar (1986)	972	1963–1980	−1.85*
Mikkelson and Partch (1986)	80	1972–1982	−3.56*
Kalay and Shimrat (1987)	455	1970–1982	−3.36*
Korajczyk, Lucas, and McDonald (1990)	1,285	1974–1983	−2.94*
Hansen and Crutchley (1990)	109	1975–1982	−3.65*
Eckbo and Masulis (1992)	1,057	1963–1981	−2.0*
Jegadeesh, Weinstein, and Welch (1993)[a]	411	1980–1989	−1.16*
Slovin, Sushka, and Bendeck (1994)[a]	175	1973–1988	−2.87*
Denis (1994)	435	1977–1990	−2.49*
Bayless and Chaplinsky (1996)	1,884	1968–1990	−2.3*
Altinkilic and Hansen (2003)	1,703	1990–1997	−2.23*
Bethel and Krigman (2004)	2,592	1992–2001	−2.01*
Heron and Lie (2004)	3,658	1980–1998	−2.5*
D'Mello, Schlingemann, and Subramaniam (2005)	1,621	1982–1995	−1.87*
(b) Private placements: $N = 2{,}830$; $AR_{pp} = 2.45^*$			
Wruck (1989)	99	1979–1985	1.89*
Herzel and Smith (1993)	106	1980–1987	1.72*
Hertzel et al. (2002)	619	1980–1996	2.4*
Chaplinsky and Haushalter (2003)	1,050	1995–2000	3.49*
Krishnamurthy et al. (2005)	397	1983–1992	1.43*
Barclay, Holderness, and Sheehan (2005)	559	1979–1997	1.7*
(c) Uninsured rights:			
Eckbo and Masulis (1992)	53	1963–1981	−0.59
(d) Standby rights: $N = 349$; $AR_{sr} = -1.33^*$			
Hansen (1988)	102	1964–1986	−2.4*
Eckbo and Masulis (1992)	128	1963–1981	−0.70*
Singh (1997)	63	1963–1985	−1.07*
Heron and Lie (2004)	56	1980–1998	−1.10
(e) Shelf offerings: $N = 1{,}851$; $AR_{sh} = -0.66^*$			
Bhagat, Marr, and Thompson (1985)	93	1982–1983	−0.81*
Moore, Peterson, and Peterson (1986)[b]	84	1982–1983	−1.10*
Denis (1991)[c]	40	1982–1986	−1.00*
Heron and Lie (2004)	256	1980–1998	−1.30*

(*Continued on next page*)

Table 13
(*Continued*)

Study	Sample size	Sample period	*AR* (%)
Bethel and Krigman (2004)[b]	747	1992–2001	−0.24
Bethel and Krigman (2004)	391	1992–2001	−1.27*
Autore, Kumar, and Shome (2004)[c,d]	156	1990–2003	−1.16

The table focuses on studies that use daily stock return to measure the SEO announcement effect *AR*, and where the flotation method may be reasonably deduced from the sample selection criteria. The sample must include primary offerings, possibly in combination with secondary equity offerings. Some studies measure *AR* over the two-day window $[-1, 0]$ while others use a three-day window $[-1, +1]$, and the table does not make a distinction between these. Some studies also separate out industrials from utilities, and when they do, we report results averaged across both issuer types. The *AR* in the panel heading is the average across the studies in the panel, weighted by the respective sample sizes. The superscript * indicates that the *AR* is significantly different from zero at the 1% level.

[a]Sample is restricted to the first SEO following the IPO.

[b]The event day is the shelf registration day (not the offering announcement).

[c]Sample is restricted to firms that issue *both* shelf and nonshelf registered shares.

[d]This abnormal return is the sum of the abnormal returns around the registration and offering dates.

number of studies of SEO announcement effects after 1986. However, more recently, Jegadeesh, Weinstein, and Welch (1993), Slovin, Sushka, and Bendeck (1994), Denis (1994), Bayless and Chaplinsky (1996), Bethel and Krigman (2004), Heron and Lie (2004), and D'Mello, Schlingemann, and Subramaniam (2005) all confirm that the market reaction to firm commitment offerings in the U.S. is on average negative and about -2%. Overall, over the period 1963–1995 and using a sample-weighted average, the market reacted to a firm commitment equity offering announcement by discounting the second-hand market price of the issuer's shares, resulting in a statistically significant $AR_{fc} = -2.22\%$.

A second striking result from the 1980s is the finding of Wruck (1989) of a significantly positive two-day market reaction of 1.9% to 128 announcements of equity private placements. The type of security sold in her private placements includes primarily common stock (101 cases) but also preferred stock, convertible preferred stock, and warrants. Thus, Wruck's sample has a different equity security composition than the studies of firm commitment SEOs. As shown in Panel (b) of Table 13, several recent studies using substantially expanded samples confirm her finding of a significantly positive announcement effect. These include Herzel and Smith (1993), Hertzel et al. (2002),

contains mostly offering information. Hence, the event dates since 1985 reflect issues that are more likely to be anticipated because the announcement of an equity issue is typically made earlier (by days or weeks) via news-wire services than the WSJ listing. This biases the abnormal return estimate".

Chaplinsky and Haushalter (2003), Krishnamurthy et al. (2005), and Barclay, Holderness, and Sheehan (2005).[36] Over the period 1979–2000, the sample-weighted average market reaction to private placements is a significantly positive $AR_{pp} = 2.45\%$.

A third important finding is that selling SEOs via the rights method appears to affect the market reaction to the issue announcement, relative to that of both firm commitments and private placements. This impact was first demonstrated by Eckbo and Masulis (1992) who examine both uninsured rights and standbys (in addition to firm commitments), and is evident also in studies examining standbys only, such as Hansen (1988), Singh (1997) and Heron and Lie (2004). As shown in panels (c) and (d) of Table 13, uninsured rights are met with a neutral market reaction—$AR_{ur} = 0.59\%$—whereas standbys elicit a significantly negative market reaction on average. The market reaction to standbys is smaller than the size of the negative market reaction to firm commitment SEOs. Over the period 1963–1998, the sample-weighted average abnormal return to standby announcements is a statistically significant $AR_{sr} \approx -1.33\%$.

Fourth, Bhagat, Marr, and Thompson (1985), Moore, Peterson, and Peterson (1986), and Denis (1991) report that early users of the shelf-registration method for offering shares (under SEC Rule 415) experienced a significantly negative market reaction of about -1%. As discussed above (Table 3), the number of shelf-registered SEOs peaked in 1982 and 1983, almost disappeared in the period 1984–1991, and then picked up again, with a relatively large number occurring over the period 1997–2003. The announcement effect of this later period is reflected in the results reported by Heron and Lie (2004), Bethel and Krigman (2004), and Autore, Kumar, and Shome (2004). These more recent studies confirm the basic conclusion from the early sample period: despite the greater timing discretion afforded shelf-registered issuers, the average market reaction is no more negative for shelf issues than for non-shelf firm commitment offerings. Over the period 1982–2003, the sample-weighted average market reaction to the announcements of shelf-registered SEOs is small, but statistically significant: $AR_{sh} = -0.66\%$.

4.4.2. Market reaction to SEOs internationally

At the time of the survey of Eckbo and Masulis (1995) there were relatively few studies reporting the market reaction to security offerings internationally. With the exception of Japan (Table 11), rights issues (uninsured or standbys) are still the norm in smaller equity markets. Table 14 summarize the findings of international studies of SEOs where the flotation methods is reported to be either uninsured rights, standbys, private placements, firm commitments or a foreign offering using either American (ADR) or global (GDR) drawing rights. Note that Table 14 is restricted to studies that show results for each flotation method separately, eliminating, e.g., studies that pool uninsured and

[36] Chaplinsky and Haushalter (2003) report that on average announcement returns are positive for traditional PIPE issuers and negative for structured PIPE issuers. Brophy, Sialm, and Ouimet (2005) also report positive announcement effect for PIPE issuers.

Table 14
Average market reaction (*AR*, %) to announcements of seasoned equity offerings (SEOs) internationally, classified by flotation method

Country	Study	Sample size	Sample period	*AR* (%)
(a) Uninsured rights: $N = 484$; $AR_{ur} = 0.70$				
Korea	Kang (1990)	89	1984–1988	0.95%
Greece	Tsangarakis (1996)	55	1981–1990	3.97*
Norway	Bøhren, Eckbo, and Michalsen (1997)	74	1980–1993	1.55*
Italy	Bigelli (1998)	82	1980–1994	0.79
U.K.	Slovin, Sushka, and Lai (2000)	20	1986–1994	−4.96*
France	Gajewski and Ginglinger (2002)	57	1986–1996	−1.11*
Sweden	Cronqvist and Nilsson (2005)	107	1986–1999	0.19
(b) Standby rights: $N = 1{,}201$; $AR_{sr} = -1.32^*$				
Japan	Kang and Stulz (1996)	28	1985–1991	2.21*
Norway	Bøhren, Eckbo, and Michalsen (1997)	114	1980–1993	−0.23
France	Gajewski and Ginglinger (2002)	140	1986–1996	−0.74*
Norway	Eckbo and Norli (2004)	143	1980–1996	−0.58
Sweden	Cronqvist and Nilsson (2005)	53	1986–1999	0.72
U.K.	Burton, Lonie, and Power (1999)[a]	37	1989–1991	−7.76*
U.K.	Slovin, Sushka, and Lai (2000)[b]	200	1986–1994	−2.90*
Hong Kong	Wu and Wang (2006b)	180	1989–1997	−3.37*
(c) Private placement: $N = 691$; $AR_{pp} = 3.12^*$				
U.K.	Slovin, Sushka, and Lai (2000)[c]	76	1986–1994	3.31*
Norway	Eckbo and Norli (2004)	136	1980–1996	1.39
Sweden	Cronqvist and Nilsson (2005)	136	1986–1999	7.27*
Japan	Kato and Schallheim (1993)	76	1974–1988	4.28*
Japan	Kang and Stulz (1996)	69	1985–1991	3.88*
Hong Kong	Wu, Wang, and Yao (2005)	99	1989–1997	1.97*

standby rights in a single sample. Eckbo and Masulis (1995) survey several of these pooled rights and standby samples, including Marsh (1979) (U.K.), Loderer and Zimmermann (1987) (Switzerland), Hietala and Loyttyniemi (1991) (Finland), and Dehnert (1991) (Australia). The main conclusion in the earlier survey was that "the average market reaction is typically positive for uninsured rights and small, but negative for standbys" (p. 1046). They do not report studies on firm commitment offerings internationally.

The evidence summarized in Table 14 goes further. Starting with uninsured rights offerings in Panel (a), uninsured rights offers are associated with a neutral or positive market reaction in smaller markets such as Greece, Norway and Sweden, but a negative market reaction in larger markets such as France and the U.K. Tsangarakis (1996) and Bøhren, Eckbo, and Michalsen (1997) report a significantly positive market reaction

Table 14
(*Continued*)

Country	Study	Sample size	Sample period	*AR* (%)
(d) Firm commitments: $N = 1{,}064$; $AR_{fc} = 1.10^*$				
Japan	Kang and Stulz (1996)	185	1985–1991	0.51*
Japan	Cooney, Kato, and Schallheim (2003)	555	1974–1991	0.72*[d]
France	Gajewski and Ginglinger (2002)	18	1986–1996	−0.33
Hong Kong	Wu, Wang, and Yao (2005)	306	1989–1997	1.93*

In the panel headings, *N* is the aggregate sample size across all studies in the panel, and *AR* is sample-weighted average market reaction. The superscript * indicates that the *AR* is significantly different from zero at the 1% level. The table is restricted to studies that (1) use daily stock return to measure the SEO announcement effect *AR* and (2) report the announcement effect by individual f lotation method. For example, studies that pool uninsured and standby rights in one sample are excluded. Some studies measure *AR* over the two-day window $[-1, 0]$ while others use a three-day window $[-1, +1]$, and the table does not make a distinction between these. Some studies also separate out industrials from utilities, and when they do, we report result averaged across both issuer types.

[a]The authors do not indicate whether their rights sample is standbys or uninsured rights. However, judging from the sample frequency, and the information in Slovin, Sushka, and Lai (2000), we placed this study in the standby category.

[b]In 111 of the 200 cases, shareholder takeup is greater than 90%. For these cases, the announcement period return is reported to be −0.33% and statistically insignificant.

[c]The authors refer to these as "placings" or "bought deals" that increases shareholder dispersion.

[d]The event day is the board meeting date.

for Greece and Norway, respectively, while Cronqvist and Nilsson (2005) report an insignificant market reaction to uninsured rights offers in Sweden. Slovin, Sushka, and Lai (2000) reports a significantly negative market reaction to U.K. uninsured rights offers, while Gajewski and Ginglinger (2002) report a significantly negative market reaction in France also. The sample-weighted cross-country average is however a non-negative and statistically insignificant $AR_{ur} = 0.70\%$.

It should be noted that the cross-country average may hide important country-specific institutional effects, which often motivates a study of foreign issues. Thus, although Slovin, Sushka, and Lai (2000) report results for a relatively small sample (20) of uninsured rights, the significantly negative market reaction may emanate from economically important unique institutional characteristics of the London Stock Exchange. A similar argument goes for the negative effect for the 57 uninsured rights offers in France studied by Gajewski and Ginglinger (2002). We return to this issue below.

Second, Panel (b) of Table 14 shows that standby offering are met with a positive market reaction in Japan (Kang and Stulz, 1996), a neutral market reaction in Norway and Sweden (Bøhren, Eckbo, and Michalsen, 1997; Cronqvist and Nilsson, 2005), and a negative market reaction in the U.K. (Burton, Lonie, and Power, 1999; Slovin,

Sushka, and Lai, 2000) and a negative announcement effect in Hong Kong (Wu and Wang, 2006b). The sample-weighted average market reaction to standbys is significantly negative: $AR_{sr} = -1.32\%$.

Third, the market reaction to private placements is consistently positive and large across countries. The largest reported impact is in Sweden, where Cronqvist and Nilsson (2005) report a market reaction of 7.2% across 136 placements, followed by Japan with approximately 4% (Kato and Schallheim, 1993; Kang and Stulz, 1996), and the U.K. with 3.3% (Slovin, Sushka, and Lai, 2000). Significantly positive effects are also reported for private placements in Hong Kong (Wu, Wang, and Yao, 2005) and Norway (Eckbo and Norli, 2004). The sample-weighted average market reaction across these private placement studies is a significant $AR_{pp} = 3.12\%$, which is close in magnitude to the average market reaction to private placements in the U.S.

Fourth, with the exception of Japan and France, the relatively expensive firm commitment underwriting method has not yet spread internationally. Both Kang and Stulz (1996) and Cooney, Kato, and Schallheim (2003) report a small but statistically significant, positive average market reaction for Japan, while Gajewski and Ginglinger (2002) reports a statistically insignificant market reaction to firm commitment offerings in France. The sample-weighted average is an insignificant $AR_{fc} = 1.10\%$. Whether this surprising result holds up in samples of Japanese SEOs after 1992, as well as internationally as other countries start to adopt the firm commitment method, remains an interesting issue for future research.

Finally, while not shown in Table 14, recent papers have studied the average market reaction when firms announce foreign exchange listings—either foreign firms in the U.S. via American Depository Rights (ADRs) and U.S. firm globally via Global Depository rights (GDRs). Chaplinsky and Ramchand (2000) compare the stock price reactions of 349 global equity issues (involving a simultaneous sale of common equity at the same offer price in the U.S. market and one or more international markets) with 459 domestic equity issues that are sold exclusively in the U.S. market during 1986–1995. They find that all else equal, the negative stock price reaction that accompanies equity issues is reduced by 0.8 percent on average for global offers compared to domestic offers of similar size, issued during the same time period.[37]

Subsequent papers have confirmed the finding of Chaplinsky and Ramchand (2000) that firms announcing global issues have a lower stock price reaction as compared to announcements of domestic (U.S.) equity issues. For example, Wu and Kwok (2002) find that announcements of global equity issues result in a percentage point lower stock price reaction relative to comparable domestic issues. Errunza and Miller (2003) document that global equity offerings of foreign firms after their initial cross listing in the United States have a reduced stock price reaction (less by 1.5 percent) as compared to stock price reaction to SEOs of similar firms on the local exchanges.

[37] This result is based on a Heckman two-step procedure to adjust for selection bias. They also find that the announcement effect is more favorable as the number of new foreign investors rises. Also see Foerster and Karolyi (2000) for information on ADR SEOs.

Table 15
Average market reaction (*AR*, %) to announcements of debt offerings by U.S. firms

Study	Sample size	Sample period	*AR* (%)
(a) Stock price reaction to straight debt offerings: $N = 3{,}041$; $AR_{sd} = -0.22$			
Dann and Mikkelson (1984)	150	1969–1979	−0.37*
Mikkelson and Partch (1986)	171	1972–1982	−0.23
Eckbo (1986)	648	1964–1981	−0.10
Hansen and Crutchley (1990)	188	1975–1982	0.11
Shyam-Sunder (1991)	297	1980–1984	−0.11
Chaplinsky and Hansen (1993)	245	1974–1984	0.05
Johnson (1995)	129	1977–1983	0.32
Jung, Kim, and Stulz (1996)	276	1977–1984	−0.09
Howton, Howton, and Perfect (1998)	937	1983–1993	−0.50*
(b) Stock price reaction to convertible debt offerings: $N = 307$; $AR_{cd} = -1.8^*$			
Dann and Mikkelson (1984)	132	1969–1979	−2.30*
Mikkelson and Partch (1986)	33	1972–1982	−1.97*
Eckbo (1986)	75	1964–1981	−1.25*
Hansen and Crutchley (1990)	67	1975–1982	−1.45*

In the panel headings, *N* is the aggregate sample size across all studies in the panel, and *AR* is sample-weighted average market reaction. The superscript * indicates that the *AR* is significantly different from zero at the 1% level. The table focuses on studies that use daily stock return to measure the SEO announcement effect *AR*, and where the flotation method may be reasonably deduced from the sample selection criteria. Some studies measure *AR* over the two-day window $[-1, 0]$, while others use a three-day window $[-1, +1]$, and the table does not make a distinction between these. Some studies also separate out industrials from utilities, and when they do, we report results averaged across both issuer types.

4.4.3. Market reaction to corporate debt offerings

The basic adverse selection argument of Myers and Majluf (1984) strongly suggests that the market reaction to security offerings should be smaller the lower the risk that the security is overpriced. This implication is also a basic motivation for the financing pecking order of Myers (1984). Given the predictable contractual payment stream embedded in a debt contract—protected by bankruptcy law—the risk of market mispricing is almost certainly lower for a corporate debt instrument than for common stock. Thus, the market reaction to debt issues should therefore be smaller than for equity.

Table 15 lists studies reporting the stock-price announcement effect of straight and convertible debt offerings by U.S. firms. In Panel (a), the overall evidence is of a statistically insignificant market reaction to straight debt issuances. Dann and Mikkelson (1984) report a significantly negative average abnormal stock return of −0.37%, while Howton, Howton, and Perfect (1998) also report significantly negative market reaction of −0.50% over the two-day announcement period. However, the average market reac-

tion is small and insignificant in all of the subsequent studies by Mikkelson and Partch (1986), Eckbo (1986), Hansen and Crutchley (1990), Shyam-Sunder (1991), Chaplinsky and Hansen (1993), Johnson (1995), Jung, Kim, and Stulz (1996) and Howton, Howton, and Perfect (1998). The sample-weighted average across all of the studies is a statistically insignificant $AR_{sd} = -0.22\%$.

Straight debt issues are to some extent predictable as the maturity date approaches and the firm needs to refinance. Bayless and Chaplinsky (1991), Chaplinsky and Hansen (1993) and Jung, Kim, and Stulz (1996) develop models to predict whether an issuer will choose to sell a public issue debt or equity. Chaplinsky and Hansen (1993) examine issuers of public debt and find that issues have substantial predictability and that issuers have significantly lower earnings, significantly higher investment growth and debt refinancing needs in the years immediately preceding and following the offering. Gomes and Phillips (2005) examine private and public security issuance activity by publicly listed firms. They find that firms with higher levels of asymmetric information measured by analysts' earnings forecast errors or dispersion in earnings forecasts are less likely to issue common stock or convertibles relative to debt in the public capital markets, but these firms are more likely to issue equity and convertibles over debt in the private capital market. They also find that smaller public firms with higher risk, lower profitability and good investment opportunities are more likely to issue equity and convertibles privately, while firms experiencing stock price rise in the prior year relative to a benchmark portfolio are more likely to issue equity in the public market.

Since announcement returns represents only the unanticipated portion of the total price effect, this raises the question of whether partial anticipation explains the largely insignificant market reaction to straight debt issues in Panel (a) of Table 15. Eckbo (1986) addresses this issue by partitioning his sample according to the stated purpose of the issue (refunding versus finding of investment program), and according to risk (bond ratings). Presumably, the degree of market anticipation is lower the riskier the debt issue, and if the purpose is to fund new investment opportunities. However, Eckbo (1986) reports that none of the subsample results sorted in this fashion indicate a significant market reaction. Shyam-Sunder (1991) also find no effect of bond risk on announcement returns, as measured by bond ratings. Bayless and Chaplinsky (1991) develop a forecasting model for a firm's debt versus equity issuance choice and find larger announcement effects when a security that is not expected is issued. For example, debt issue announcements when an equity issue was expected have a positive 1% average abnormal stock return (1 day). Chaplinsky and Hansen (1993) partition the debt sample according to stated purpose of the issue, and find that the market reaction is insignificant except in the sample of 68 issues with "no purpose specified" where it is a significantly negative -0.63%. Overall, there are few indications that the evidence in Panel (a) is significantly affected by partial anticipation. However, this remains a topic for future research.

Finally, Panel (b) of Table 15 lists studies that report the stock market reaction to convertible debt offerings. Since convertibles are a hybrid of straight bonds and warrants, the risk of overpricing (of the warrant) is greater than for straight bonds. They are

Table 16
Summary of sample-weighted average market reaction (AR, %) to security offerings (aggregate sample size and sample period in parentheses)

Type of offering	U.S.	Foreign
A. SEOs		
Uninsured rights	$AR_{ur} = -0.59$ (53; 1963–1981)	$AR_{ur} = 0.70$ (484; 1980–1999)
Standby rights	$AR_{sr} = -1.33^*$ (349; 1963–1998)	$AR_{sr} = -1.32^*$ (1,201; 1980–1999)
Private placements	$AR_{pp} = 2.45^*$ (2,830; 1979–2000)	$AR_{pp} = 3.12^*$ (691; 1974–1999)
Firm commitments	$AR_{fc} = -2.22^*$ (15,017; 1963–2001)	$AR_{fc} = 1.10^*$ (1,064; 1974–1997)
Shelf offerings	$AR_{sh} = -0.66^*$ (1,851; 1980–2003)	n.a.
B. Debt offerings		
Straight debt	$AR_d = -0.24$ (2,615; 1964–1993)	n.a.
Convertible debt	$AR_{cd} = -1.82^*$ (307; 1964–1982)	n.a.

The AR reported in this table also appear in the panels headings in Tables 13, 14 and 15. The reported AR weighs each individual study in the panel with its sample size. Superscript * indicates statistical significance at the 1% level.

also less predictable than straight debt offerings. So, the expectation is that convertibles will be met with a stronger market reaction than straight debt issues. Dann and Mikkelson (1984), Mikkelson and Partch (1986), Eckbo (1986), and Hansen and Crutchley (1990) all report negative and statistically significant market reactions to convertible debt offerings. The sample-weighted average abnormal return is a statistically significant $AR_{cd} = -1.82\%$.

4.5. Implications of the announcement-return evidence

For convenience, the sample-weighted averages reported in these tables are summarized in Table 16. The significant price reaction to security offerings leaves little doubt that these corporate events typically convey significant new information to the market. As such, the evidence provides generic support for models of the issue decision that presume some form of asymmetric information between the issuer and the market.

What is more difficult to determine, of course, is the precise content of the new information that the market is reacting to. We discuss some possible inferences below. These are the result of cross-sectional analysis of the announcement effect, often performed using multivariate regressions with the announcement effect AR as dependent variable. The expected profits from issuing and investing shown in equation (1), and

the various theoretical models listed in Table 12 suggest a link between AR and a set of characteristics:

$$AR = f(m, C, k, q, \beta, \sigma, I, b/a, P), \quad m = ur, sr, fc, pp, \tag{5}$$

where the parameters are the flotation method choice ($m \in [ur, sr, fc, pp]$), direct and indirect issue costs (C), expected shareholder takeup of the issue (k), signal quality or the informativeness of the available issue-quality certification technology (q), private benefits of control (β), the ex ante risk that the security is overpriced (σ), growth as given by the size of the project's investment amount (I) and the size of the project's NPV relative to the value of assets in place (b/a), and market beliefs about the nature of firms' equilibrium flotation strategies. These beliefs imply an issue market price of P, which in some equilibria are lower than the true, intrinsic value, resulting in an undervaluation cost-component in C.

A caveat before proceeding with the results: it should be noted that the explanatory power of regressions of the type in equation (5) as reported in the literature is uniformly low, almost always less than 10%. More seriously, these cross-sectional regressions are typically estimated using linear estimators (such as OLS). Eckbo, Maksimovic, and Williams (1990) show that linear estimators (such as OLS and GLS) are biased and inconsistent when the issuer self-selects the timing of the event (in this case security issue) and derive a consistent, non-linear estimator.[38] Some studies (e.g., Bøhren, Eckbo, and Michalsen, 1997) report results with the nonlinear estimator, while others (e.g., Eckbo and Masulis, 1992) report that key inferences are unchanged when using OLS. Moreover, the potential for bias is smaller for utilities that are constrained by the regulatory process. However, for the vast majority of studies reporting cross-sectional regressions, the magnitude of the bias introduced by self-selection is largely unknown.

Adverse Selection and growth opportunities. In Myers and Majluf (1984), the market prices firms correctly only on average, causing some highly undervalued firms to avoid dilutive equity issues. Here, the information content is simply the adverse selection revealed by the firm's willingness to issue (separating equilibrium). The negative average market reactions to SEOs sold *to the market* in the U.S., such as in standby rights and firm commitment offerings, is consistent with this generic framework. Moreover, as pointed out by Eckbo and Masulis (1992), equity issues that are purchased by current shareholders (i.e., *not* sold to the market) results in pooling and therefore do not convey information. This prediction is also supported by the evidence on uninsured rights in Table 16, both in the U.S. and internationally.

The adverse selection model also implies that the market reaction to equity offerings should be more negative the greater the issue size (Krasker, 1986) and the greater the ex ante uncertainty that the issue is overpriced. The uncertainty hypothesis is supported by the evidence that debt offerings are met with little or no market reaction, while convertible debt offerings produce a negative effect that is only about half the size of the

[38] This issue is surveyed extensively in Li and Prabhala (2007) (Chapter 2 of this volume).

average market reaction to SEOs. Convertibles are a hybrid between debt and equity, and a convertible debt offering may be viewed by the market as a delayed equity issue (Stein, 1992). The uncertainty hypothesis is also supported by the finding that the market reaction to equity issues by regulated utilities is much smaller (though still significant) than the average market reaction to industrial issuers. The regulatory process required for a utility to issue equity reduces the issuer's discretion to time the issue to periods where the market is overvaluing the stock.

The evidence on the effect of issue size on the market reaction is mixed. While Jung, Kim, and Stulz (1996) find no relationship to issue size, Masulis and Korwar (1986), Korajczyk, Lucas, and McDonald (1990), and Bayless and Chaplinsky (1996) find a significantly negative relation between the announcement-induced abnormal return and the size of the offer.

As is evident from equation (1) in Section 4.2, the firm's incentive to issue is greater the greater the investment project's NPV (b). If b is sufficiently large relative to the value of assets in place a, then the firm will issue even it the shares are undervalued by the market. If b is sufficiently large relative to a for all firms, there is no adverse selection (pooling equilibrium) and no adverse market reaction to the issue announcement. However, in a separating equilibrium (with adverse selection), the market reaction will be more favorable the greater the ratio b/a. Since the value of b is unobservable to the econometrician, studies have used the issuer's B/M ratio or Tobin's Q as a proxy for "growth". The evidence is mixed: while Jung, Kim, and Stulz (1996) report a significantly positive relation between the market reaction to equity announcements and B/M ratios, several studies fail to find a significant relation (Barclay and Litzenberger, 1988; Dierkens, 1991; Pilotte, 1992; Denis, 1994).

Shareholder takeup. In Eckbo and Masulis (1992), shareholder takeup k simply acts like financial slack. The greater k, the smaller the issue sold to the market, and the lower the scope for wealth transfer from outside investors. Thus, the greater k, the smaller the market reaction to the issue announcement. In the notation of Table 16, the prediction is $AR_{fc} < AR_{sr} < 0$ and $AR_{ur} \approx 0$. This prediction is supported by the evidence on U.S. offerings: $AR_{fc} = -2.2\%$, $AR_{sr} = -1.3\%$ (both significantly different from zero and significantly different from each other), and $AR_{ur} = -0.6\%$ (not significant). There is also direct evidence that the takeup parameter k is highest in uninsured rights offerings, lowest in firm commitments, with standbys in between. Thus, the evidence supports the hypothesis that expected shareholder takeup affects the flotation method choice under adverse selection.[39]

Quality certification. In the vernacular of Eckbo and Masulis (1992), Bøhren, Eckbo, and Michalsen (1997), and Eckbo and Norli (2004), the significantly negative market

[39] Bøhren, Eckbo, and Michalsen (1997) and Cronqvist and Nilsson (2005) provide direct evidence on k. Generally speaking, the value of k depends on shareholder (personal) wealth constraints and demand for diversification by risk-averse investors. Moreover, k is likely to reflect the presence (if any) of individual shareholders' private benefits of control.

reaction to standbys and firm commitment offerings indicate that the signal quality of the underwriter certification technology only partially reveals the issuer's true quality. With perfect revelation and firm-value-maximization on the part of the issuing firms, the market reaction would be non-negative.[40] Thus, the evidence favors models that presume some form of imperfection in the underwriter's quality certification.

Shareholder monitoring. A private placement offers opportunities and incentives for communication between the issuer and the private placement investor which may alleviate ex ante investor nervousness with the possibility that the offer is overpriced. This may induce *positive* selection in the pool of private placement issuers. This is consistent with the evidence. As summarized in Table 16, the typical private placement offering of equity generates a significantly positive market reaction, with $AR_{pp} = 2.5\%$ in the U.S. and $AR_{pp} = 3.1\%$ internationally.

What is the nature of the positive information? Wruck (1989) and Herzel and Smith (1993) suggest that the positive announcement effect reflects the fact that the firm is willing to subject itself to increased monitoring and certification by a large, private placement investor. A positive announcement effect if also predicted by the variant of the Myers and Majluf (1984) model developed by Cooney and Kalay (1993) and Wu and Wang (2005), where managers are allowed to select value-decreasing investment projects. Cronqvist and Nilsson (2005) and Wu and Wang (2005) argue that large shareholders prefer a rights issue over a private placement in order to protect private benefits of control. Cronqvist and Nilsson (2005) conclude that family-controlled firms in Sweden avoid issue methods that dilute control benefits. Wu, Wang, and Yao (2005) and Wu and Wang (2006b) reach a similar conclusion after studying control-diluting placements and rights issues in Hong Kong. Thus, the selection of private placement carries a positive signal relative to a rights offer, which is also consistent with the evidence.

Do private placements in fact lead to increased monitoring? Empirically, Barclay, Holderness, and Sheehan (2005) conclude that there is little direct evidence of monitoring activities by private placement investors in the U.S. If this is in fact true, then the positive announcement effect of private placements represents positive information about the issuer per se, perhaps due to the certification role played by the private placement investor (Eckbo and Norli, 2004).

Managerial earnings expectations. Ross (1977) develops a model in which the firm's issue decision reflects private managerial information about the firm's future earnings prospects. Managers face personal bankruptcy costs and prefer to issue equity over debt when they have private information indicating a future decline in earnings, and vice versa for debt issues. This model implies a negative market reaction to an equity issue and a positive market reaction to a debt issue. While the empirical evidence is consistent with the first part of this prediction, the evidence contradicts the second part. The

[40] As discussed in Section 3 above, the focus of the underwriter is typically on certifying the existence and value (b) of the investment project, the validity of the firm's accounting statements, the firm's strategic plans, etc.

market reaction to straight debt offerings summarized in Table 16 is not statistically significantly different from zero. As shown by Eckbo (1986), even large debt issues—where the stated use of the proceeds is to fund the firm's investment program—do not elicit a positive market response.

Wealth transfer to bondholders. Holding the firm's investment policy constant, an equity issue reduces the risk of the firm's outstanding debt. However, it is unlikely that this effect explains much of the empirical evidence. While studies of bond returns in response to equity issues are difficult due to data constraints, Kalay and Shimrat (1987) find that equity issues on average cause bond prices to *fall* rather than increase. Moreover, as indicated above, there is little if any evidence that large debt issues cause equity prices to rise. In sum, the wealth transfer hypothesis is inconsistent with the evidence.

4.6. Signaling and the rights offer discount

Heinkel and Schwartz (1986) presents a model in which relatively high-quality uninsured rights issuers signal their quality to the market by *lowering* the rights offer discounts. They assume that a failed rights offer is costly for all issuers. Suppose there are two issuer types, "high" and "low", and let the two firms have the same ex ante market price P (before the rights offer announcement). The low type has a greater probability than the high type of experiencing a stock price reduction over the fixed rights offer period (say, four weeks) before the rights expire. If the rights subscription price P_0 is set close to P, the rights are expected to trade close to zero, and the probability that the offer will fail (because the stock price drops) is greatest for the low-value type. In the separating equilibrium considered by Heinkel and Schwartz (1986), the high-value firm signals its type by reducing the rights offer discount.

Alternatively, one may use a signaling models such as that of John and Williams (1985) to generate a *positive* impact of a rights offer discount, opposite to Heinkel and Schwartz (1986). As discussed by Hietala and Loyttyniemi (1991) and Bigelli (1998), in some European countries, a rights offer sometimes produces an increase in dividend yield. For example, if the rights offer does not affect the firm's dollar dividend per share, and the rights offer subscription price is set at a discount from the pre-offer stock price, then the dividend as a percent of the post-offer share price increases as the share price falls due to the discounted sale of shares. For a given dollar dividend, the increase in dividend yield is proportional to the discount in the rights offer price. The dividend yield will increase as long as the dividend per share is reduced by less than the share-split effect of the rights offer discount. A positive signaling effect of the dividend implication of a rights offer discount also reduces the expected cost of offering failure, as it increases the probability that the rights will be in the money at the expiration date.

We are aware of four studies that report evidence on the information content of rights offer discounts. First, with their sample of U.S. rights offers, Eckbo and Masulis (1992) regress the offering-day abnormal stock return (which in the U.S. contains the market

reaction to the news of the offering price) on offer-specific characteristics, including the discount and the flotation method. The estimated coefficient on the discount is insignificantly different from zero whether the issuer is an industrial firm or a public utility. The lack of a significant impact of the discount holds whether or not they account for subscription precommitments in uninsured rights. This is important because greater levels of subscription precommitments lower the risk of rights offer failure, thus reducing the signaling effect of the discount itself. Overall, they find no support for the proposition that the rights offer discount signals information (positive or negative) to the market about the true value of the issuer.

Second, using Norwegian standbys and uninsured rights offerings, Bøhren, Eckbo, and Michalsen (1997) also examine the information content of the rights offer discounts. In contrast to rights offerings in the U.S., Norwegian issuers are required to set the rights offer price a minimum of three weeks prior to the beginning of the rights offer period. With a minimum rights offer period in Norway of two weeks, this means that the issuer (and standby underwriter) must forecast the issuer's secondary market price at least five weeks ahead when determining the optimal offer price. The longer prediction period probably increases the risk of offering failure relative to the U.S., making the Norwegian rights offers a relatively powerful laboratory for examining signaling effects. They fail to find a statistically significant effect of the offer price discount on the market reaction to rights offer announcements.

Third, with a sample of U.S. utility standby rights offerings, Singh (1997) report that abnormal stock returns over the "rights settlement period" (i.e., the period from the day before the offer price release day and the following six days) are positively correlated with the offering price discount.[41] Since his sample includes fully guaranteed rights offerings only, there are no failure costs, so the signaling argument of Heinkel–Schwartz does not apply.

Finally, focusing specifically on dividend implications of rights issues, Bigelli (1998) reports a dividend-yield increase in more than 80% of his sample of Italian rights offers. He finds that the average market reaction to rights offer announcements is positive, and positively related to the subscription price discount. This is inconsistent with Heinkel and Schwartz (1986) but consistent with separating equilibria in which unanticipated dividend increases have information content. Further research is needed to establish whether dividend increases associated with rights issues have information content also in other issue markets.

[41] Singh (1997) reports that there are on average 30 trading days between the first public announcement of the standby and the "price release date" (the date on which the market first learns of the actual subscription price). The price release date typically coincides with the date of the price amendment of the offering prospectus, which is also typically the start of the offering.

5. Security offerings and market timing

Consider a company that faces a steady stream of new projects. In the standard corporate finance textbook, projects are executed if they have a positive net present value. If the owner of the project needs external financing, capital markets will provide the needed funds and the type of security has no effect on the project's value. In this setting, there is no room for timing a security offering. However, Graham and Harvey (2001) present survey evidence that suggests that managers are concerned about the appropriate timing of equity issues. Moreover, the stylized facts concerning the stock price dynamics around SEOs (a stock price runup prior to the issue, a negative market reaction to the announcement of the issue, and long-run returns that appear low compared to similar firms) seems to indicate that managers are timing these issues around periods of temporary overvaluation.

This section reviews various models that focus on explaining the timing of seasoned equity offerings. Prior to the mid 1990s, the low long-run stock returns were not commonly known. Thus, papers written prior to this period focused on explaining the stock price runup and the negative average announcement effect. Later models also had to explain post-issue stock price performance patterns. We discuss three classes of models: one based on rational market pricing, another with some non-rational agents, and finally a statistical model of "pseudo-timing".

5.1. Timing theories with rational market pricing

As discussed in Section 4, information asymmetry between managers and investors may create an incentive for managers to time an equity issue. Some undervalued firms will forgo profitable projects because the dilution costs of issuing undervalued equity borne by existing shareholders are too high relative to the project's profitability. Other undervalued firms will only issue if the project can be financed with debt. Myers (1984) builds on this insight and suggests that there is a financing choice pecking order in which firms only use equity as a last resort.

Korajczyk, Lucas, and McDonald (1992) and Choe, Masulis, and Nanda (1993) develop models of dynamic adverse selection that imply a relationship between equity issue activity and, respectively, firm specific information releases and the business cycle. The model of Korajczyk, Lucas, and McDonald (1992) predicts clustering of equity issues after information releases (especially quarterly and annual financial reports). Choe, Masulis, and Nanda (1993) observe that during periods of economic expansions, corporate investment opportunities are more profitable, and thus, adverse selection costs are lower. In these models, managers time the sale of equity offers to periods when information asymmetries are less severe. Bayless and Chaplinsky (1996) report that equity issues tend to cluster in periods with smaller average announcement effects. They interpret this pattern as evidence that issuers timing equity offerings to periods with lower levels of asymmetric information.

The model of Lucas and McDonald (1990) departs from other models of adverse selection in that they allow the firm's investment opportunity to be postponed. This gives undervalued firms an incentive to postpone an issue until the stock price is higher relative to the manager's valuation based on proprietary information. This implies that empirically we should obverse more equity issues following bull markets.

Projects that can be postponed as the firm waits for more favorable market conditions to issue equity can be viewed as real options. Carlson, Fisher, and Giammarino (2005, 2006) present a real option model with rational agents that can explain the stock price dynamics around seasoned equity offerings. We discuss these models in more detail below.

5.1.1. Adverse selection and the business cycle

In Choe, Masulis, and Nanda (1993), an adverse selection argument similar to Myers and Majluf (1984) is developed where firms choose between issuing debt and equity across business cycle expansions and contractions, where firms receive non-deferrable profitable investment opportunities, and they must issue debt or equity securities to pursue them.[42] If a firm issues debt, investors will demand either protective covenants or a price discount for anticipated asset substitution risk once the debt is issued. This imposes a debt issuance cost on all issuers. On the other hand, firms with undervalued equity will only issue equity when the dilution cost from selling undervalued stock is less than or equal to the debt issuance cost.[43] In the aggregate, the marginal equity issuer will find the dilution cost of issuing undervalued equity is just equal to the cost of debt issuance and will be indifferent to issuing debt or equity. All other firms will find that one of the two securities will dominate due to their lower issuance costs. Also, if a firm issues equity, then the market knows that the equity was not substantially underpriced, because if it was the firm would have issued debt. Thus, an equity announcement should be greeted with a negative price reaction because investors now know that the firms issuing equity are drawn from a less desirable distribution that is truncated from above and the opposite is true for firms issuing debt.

Choe, Masulis, and Nanda observe that corporate investment opportunities are typically more profitable in periods of economic expansions than during contractions. This can reduce the dilution effect of equity issuance, though the cost of debt issuance is relatively insensitive to the point in the business cycle when an offer occurs. In economic expansions it is common knowledge that the average firm issuing equity will be more profitable and the marginal equity issuer will need to be more underpriced ex ante, if its equity dilution effect is to equate to the debt issuance cost. In addition, all less underpriced firms will prefer to issue equity. Thus, fewer firms will choose to issue debt over

[42] Parts of this section are drawn from Eckbo and Masulis (1995).

[43] The dilution cost of issuing equity is assumed to be more than offset by the profits of the investment opportunity or else no investment would take place.

equity. As more profitable and more underpriced firms find it optimal to equity finance, the equity offer announcement effect (the adverse selection effect for the average equity issuer) is reduced, lowering the issuance cost of equity. Thus in economic expansions, the model predicts a smaller equity offer announcement effect and an rise in the relative frequency of equity offers.[44]

Consistent with the prior prediction, both Moore (1980) and Choe, Masulis, and Nanda (1993) find empirical evidence that the frequency of equity offers relative to debt offers rises in expansions, while at the same time the magnitude of the negative stock price reaction to firm commitment equity offer announcements decreases. In contrast, debt issues are insensitive to this equity issue mispricing effect. The evidence in Choe, Masulis, and Nanda (1993), Marsh (1982) and Taggart (1977) indicates that the number of straight debt offers does not fall in economic contractions and may in fact rise if interest rates also fall with the contraction. This latter effect may in part reflect debt refinancing activities in these periods.

The model of Choe, Masulis, and Nanda (1993) also predicts that the adverse selection effect increases as investor uncertainty concerning the value of assets in place rises. Schwert (1989) documents that stock price volatility varies over the business cycle, increasing during recessions.[45] Controlling for the effect of the business cycle, Choe, Masulis, and Nanda (1993) find that the relative frequency of equity issues is significantly negatively related to the issuer's daily stock return variance, which gives further empirical support to their adverse selection framework.

Several other hypotheses concerning the timing of equity offers can be extended to a business cycle environment. For example, under Myers (1984)'s pecking order hypothesis, firms are viewed as preferring to finance projects internally if possible, otherwise to issue low risk debt and to issue equity only as a last resort. Imposing an arbitrary limit on firm leverage, the timing of equity issues is affected by business cycle downturns that reduce internal sources of funds and raise leverage by lowering asset values, thereby making equity offers more attractive. However, this equity issuance scenario is inconsistent with the evidence found in Choe, Masulis, and Nanda (1993).

Another hypothesis is based on debt-equity wealth transfers predicted by Galai and Masulis (1976) and Jensen and Meckling (1976) to occur when leverage is unexpectedly revised. If a firm issues equity, thus lowering its leverage, debtholders gain since their risk premium continues to be paid in full, while their risk bearing falls. This tends to discourage management seeking to maximize shareholder wealth from undertaking equity offers, except when leverage has become unacceptably high. In economic contractions, debtholders bear greater risk and expect greater risk premiums. So in downturns, equity offers cause leverage to fall more, resulting in larger reductions in debt risk-bearing and

[44] If less profitable investment projects or projects with varying profitability are assumed, then the model predicts in economic expansions that fewer undervalued firms will forego equity financing because of their project's greater profitability.

[45] Schwert links this volatility increase to increases in operating leverage, which is likely to be positively related to investor uncertainty concerning the value of assets in place.

greater debtholder wealth gains. Thus, there are greater costs to equity issues in economic downturns, leading to a lower predicted frequency of equity offers and a more negative stock price reaction. However, the predicted positive price reaction of outstanding debt to equity offers under the wealth transfer hypothesis is not observed by Kalay and Shimrat (1987).

In the Stulz (1990) model of free cash flow, debt issuance becomes more attractive when a firm's free cash flow increases. In economic contractions, if earnings decline less sharply than capital spending, which is typically the case, then free cash flow can increase, which increases the attractiveness of debt offerings. The cost of debt issuance in the Stulz model is underinvestment in profitable projects, but this would tend to be less of a problem in economic downturns. Thus, debt issuance would appear to be predicted to rise in contractions under the Stulz model, which is contrary to the evidence in Marsh (1982) and Taggart (1977), but somewhat supported by the evidence reported by Choe, Masulis, and Nanda (1993). This prediction is also supported by the evidence found in Jung, Kim, and Stulz (1996), who observe that firms with relatively good investment opportunities measured by the market to book ratio, are significantly more likely to issue equity over straight debt.

Lucas and McDonald (1990) develop a dynamic model of the equity issuance process that predicts a greater frequency of equity issuance following a general stock market increase. They show that since firm's with temporarily underpriced stock have an incentive to postpone an offering until the stock price is higher, the resulting average pre-announcement price path of these issuing firms will be upward sloping. On the other hand, firms with temporarily overpriced stock will issue equity immediately as new investment opportunities arise. If the arrival of investment projects is uncorrelated with a firm's price history, then the average pre-equity offering announcement price path of temporarily overvalued stocks will be flat. As a result, the average preannouncement price path of all issuing firms will be upward sloping, as is typically observed in samples of firm commitment equity offers. Lucas and McDonald also argue that the market reaction to an equity issue announcement will be more negative for firms with higher pre-announcement period stock price gains, which is supported by the regression results of Masulis and Korwar (1986), Korajczyk, Lucas, and McDonald (1990), Eckbo and Masulis (1992), and Jung, Kim, and Stulz (1996).

As discussed in Section 4, Eckbo and Masulis (1992) point out that increased shareholder participation in equity issues reduces the incentives of firms with undervalued equity to postpone their offers since current shareholders capture part of any underpricing. At one extreme, when current shareholders purchase the entire issue (shareholder takeup $k = 1$), the firm issues immediately regardless of its current degree of underpricing. Thus, in a sample of issuers where the average level of shareholder participation is known to be large, the Eckbo and Masulis (1992) model predicts that there should be little or no stock price runup prior to the issue announcement. This prediction is supported by their evidence of little or no runup prior to an uninsured rights offer announcement, a modest positive runup prior to standby offer announcement and a larger positive runup effect prior to a firm commitment underwritten offer announcement.

Another hypothesis that predicts variation in the relative frequency of equity and debt offers over the business cycle is the belief of many practitioners that management prefers debt issuance when interest rates are historically low and prefers to issue stock when its price is historically high, regardless of whether this is caused by relatively low equity risk premiums or relatively high expected cash flows.[46] Since stock market prices tend to reflect future economic prospects, this hypothesis tends to predict increases in equity offers in economic expansions, when equity prices are relatively high and debt issues in economic contractions, when interest rates are also low.[47] These predictions are consistent with the evidence in Marsh (1982) and Taggart (1977), but only partially consistent with the evidence in Choe, Masulis, and Nanda (1993).

Bayless and Chaplinsky (1991) explore the effects of both firm-specific and macroeconomic variables on the security issue choice. The macroeconomic variables include the prior 3 month performance of the stock market (S&P 500), 3 month change in the Treasury bill interest rate and a corporate default premium. They find larger announcement effects when a security that is not expected is issued. Korajczyk and Levy (2003) also explore the effects of macroeconomic conditions and financial constraints on the security issue choice. They report that financially unconstrained firms act in a significantly different manner from financially constrained firms, which are defined as firms not paying cash dividends, not making net equity or debt repurchases and having a market to book ratio of greater than one. The lagged macroeconomic variables that they examine are: the term spread, the default spread and a three month equity market return. They find that unconstrained firms issue activity is significantly affected by macroeconomic variables, while for constrained firms, this is not the case, except for the lagged stock market return. They also find that equity issuance is more likely when the lagged three month average of two-day SEO announcement returns is less negative and when the issuer's prior one year abnormal stock returns is higher. Korajczyk and Levy also estimate firm target leverage and then use deviations from it as another explanatory variable for the security issue choice decision and find that a leverage deficit leads to a significant increase in debt issuance. Lastly, they report that target leverage is counter-cyclical for the unconstrained firms, while it is pro-cyclical for the constrained firms. Their results suggest that researchers should be concerned with whether an issuing firm is financially constrained or not and they should also consider including macroeconomic variables as controls in their analysis of offering announcement effects.

5.1.2. Optimal investments and equity offerings

As pointed out by Carlson, Fisher, and Giammarino (2005, 2006), it is commonly assumed that investments in risky projects will increase asset risk. Moreover, this assumption is difficult to square with the observation that post SEO long-run stock returns

[46] See, for example, the survey of CFOs by Graham and Harvey (2001).

[47] This equity issuance effect can also be reinforced when warrants and convertible securities are outstanding, since a rise in the stock price can push these options into-the-money and also make conversion forcing calls attractive for many firms.

are low compared to the stock returns of similar non-issuing firms (also shown in Section 5.3 below). However, they argue that this observation follows naturally when projects are viewed as options on the cash flow potentially generated by the project.

When project execution is flexible in time, a project becomes a real option. Managers can time the starting time of the project to maximize the value of the firm. An option to grow the company through execution of the project is a levered claim. The required return on a levered claim is higher than the required return on an unlevered claim on the same assets. Exercising the real option, i.e., making the investment necessary to start the projects, unlevers the claim. Thus, when firms grow they convert real options into assets in place. The assets may be risky, but an option on these assets is even riskier. Thus, when projects are financed using seasoned equity, the model predicts that realized returns on average should be lower after a SEO. This does not happen because the SEO is timed, but rather because there has been a fundamental shift in the riskiness of the firm's assets. Since growth options only are exercised when they move sufficiently in-the-money, the model also explains the pre-issue stock price runup.

In the model of Carlson, Fisher, and Giammarino (2005, 2006) the required return is endogenous and depends (among other things) on the optimally timed investment decisions made by the firm. If the expected return is assumed to be time varying but exogenous, more projects will become profitable as the discount rate drops. This will increase investments and lead some firms to raise capital. Thus, time varying expected returns predict that stock prices will rise prior to equity issues and that returns will be lower after the issue. Pastor and Veronesi (2005) develop a model of IPO waves along these lines. Their model predicts that IPOs should cluster and that such IPO waves should be preceded by high market return and followed by low market return.

The relationship between investments and stock return was first formalized by Cochrane (1991). In a production based asset pricing model, Cochrane shows that a firm's investment return (the rate of return obtained on the marginal real investment) should be equal to the stock return. Thus, when the real investment level is high, the marginal return on invested capital is low, and stock returns should be correspondingly low. Cochrane (2005) interprets this argument as a first-differenced version of Q-theory of investment. Zhang (2005) develops the Q-theoretical argument further. Zhang focuses on time varying expected return and shows how Q-theory, among other things, implies that firms conducting a SEO should have lower post-issue returns than otherwise similar firms. Lyandres, Sun, and Zhang (2005) explore the investment based explanation for the low long-run stock returns of SEO firms. They find the investment to asset ratios of SEO firms are about twice as large as the investment to asset ratios of non-issuing firms. Thus, under the Q-theory of investment, the expected return of SEO firms should be lower than the expected return for non-issuing firms.

In sum, the investment based theories predict that subsequent to an SEO, a firm will have lower market risk and thus, lower expected rates of return. This offers a potential explanation for the finding, discussed in detail in Section 5.3 below, that stock returns are relatively low—but not necessarily *abnormally* low—following SEOs or IPOs. It also suggests that matching an equity-issuing firm with a non-issuing firm based on size

and book-to-market ratio alone may be insufficient as a control for systematic risk. Such a match ignores the lower risk caused by the issuer's investment activity, and may lead to spurious evidence of "abnormal" post-issue returns.

5.1.3. Pseudo market timing

Schultz (2003) proposed pseudo market timing as another rational market explanation for the weak long-run stock returns observed after equity issues. The premise for the pseudo market timing hypothesis is that more firms issue equity as stock prices increase. It is irrelevant for the hypothesis why this happens, but, any of the rational theories discussed above could be the reason for increased issue activity as stock prices increases. Regardless of why the number of issues increases, the long-run performance has nothing to do with manager's predicting future returns. Schultz (2003) shows that if firms tend to issue stock after stock price increases (for whatever reason), on average issues will be followed ex post by underperformance. The reason is simple. Consider IPOs and suppose expected one-period returns are zero for all periods and all IPOs. Moreover, the return distribution is a bimodal $+10\%$ and -10% in each period. Let there be a single IPO at time zero. If the return in period one is -10%, there will be no new IPOs at time one. Alternatively, suppose the return in period one is $+10\%$ and that there are four IPOs in this period. Now, compute the one-period abnormal buy-and-hold return for these two equally likely sample paths. It is 2% for the "up" sample and -10% for the "down" sample, with an equally weighted average of -4%. Schultz (2003) refers to this result as "pseudo market timing" because it may easily be confused by the researcher with real forecasting ability on the part of issuing firms' managers.

Several authors have explored to what extent pseudo market timing can explain the low return observed after IPOs. Dahlquist and de Jong (2004), Viswanathan and Wei (2004), and Ang, Gu, and Hochberg (2005) argue that pseudo market timing only is a potential explanation for the low post issue return when samples are small. Based on simulation experiments, all papers conclude that pseudo market timing is highly unlikely to be the main explanation for the low post issue stock market returns. The simulation experiments assume a stationary event generating process. Schultz (2004) show that one cannot reject a null that IPOs follow a nonstationary process and goes on to argue that, although pseudo market timing is a small sample problem, it is likely to be important in practice. Note that Schultz (2003)'s pseudo-timing argument also holds in principle for other security issuances, and in particular for SEOs where the matched-firm technique also have produced evidence of long-run underpricing by issuing firms (discussed below).

5.2. Timing theories with non-rational market pricing

5.2.1. Timing of firm-specific returns

The timing hypothesis ("windows-of-opportunity") builds on the notion that investors are overly optimistic about the prospects of issuing firms, and as a consequence prices

do not fully incorporate managerial incentives to time equity issues. This results in initial overpricing of issuing firms and a subsequent long-run underperformance when investors correct this initial mispricing over time.

The overconfidence hypothesis of Daniel, Hirshleifer, and Subrahmanyam (1998) is closely related, but is derived in a formal model and carries some explicit empirical predictions. The overconfidence hypothesis is based on the assumption that investors are overconfident about the precision of their private information, but not about the precision of public information. Overweighting private information relative to public information causes underreaction to new *public* information. Thus, the theory predicts that discretionary corporate events (such as equity issues) associated with abnormal announcement period returns, on average should be followed by long-run abnormal performance of the same sign as the average announcement period abnormal return, and there should be a positive correlation between announcement period abnormal returns and post-offer long-run abnormal returns.

Several empirical papers have explored different aspects of the timing and overconfidence hypotheses. Teoh, Welch, and Wong (1998) look at discretionary accruals in the years around an equity offering. The idea is that if investors are overly optimistic about the prospect of firms issuing equity, they would be willing to buy more shares and pay higher prices for them. As a result, issuing firms have incentives to cultivate this optimism by reporting inflated earnings before an equity offer. Both papers find evidence of earnings management prior to SEOs. For example, Teoh, Welch, and Wong (1998) find that although cash flows from operations on average decline prior to the SEOs, the reported discretionary accruals cause earnings to peak around the offer dates. Moreover, the amount of discretionary accruals prior to the seasoned equity offering is negatively related to the post-issue long-run stock return performance. The authors view this as evidence in favor of timing and overly optimistic investors. However, this issue is not settled as Shivakumar (2000) produces contradictory evidence using the specification of Teoh, Welch, and Wong (1998).

Cornett, Mehran, and Tehranian (1998) employ a direct test of the relationship between the incentive to time an issue and the subsequent stock return performance. They study voluntary and involuntary SEOs by commercial banks. Capital regulations in the banking industry state that banks are not allowed to have total capital ratios below a certain level. If the total capital ratio falls below the regulated lower bound, a bank may need to issue new equity to raise their capital ratio. Cornett, Mehran, and Tehranian (1998) define an involuntary SEO as an issue by a bank with capital ratio close to or below the required minimum ratio. If timing is driving the long-run underperformance of SEOs, we should expect to see less or no underperformance for involuntary issues. The results support the timing hypothesis, showing no abnormal three-year post issue stock return performance for the involuntary issues, while the voluntary issues show significant underperformance.

Brous, Datar, and Kini (2001) perform another test of the timing and overconfidence hypotheses. They argue that if managers are timing equity issues and investors systematically underreact to the issue announcements, we should expect to see that investors

are disappointed when firms convey their post-issue earnings. That is to say, post-issue earnings announcement on average should be associated with negative stock price reactions. However, their results show no evidence of abnormal stock price reactions to the earnings announcements.

Kang, Kim, and Stulz (1999) tests the overconfidence hypothesis using data on Japanese public and private equity offerings. The non-negative announcement period abnormal return to Japanese equity offerings supports the view that equity offerings are regarded as good news in Japan. Nonetheless, they document post-issue negative long run abnormal performance. Taken at face value, this is evidence goes against the overconfidence hypothesis, but is consistent with investment based theories of equity issuance.

5.2.2. Timing the market

Baker and Wurgler (2000) document that the proportion of equity in total new issues, termed "the equity share", is negatively correlated with future aggregate equity market returns. For example, when the equity share was in its top historical quartile, the average market return in the following year was -6%. This could suggest that managers are able to time the market component of their company's returns. However, Baker, Ruback, and Wurgler (2007) is cautious about this interpretation. They suggest that: "A more plausible explanation is that broad waves of investor sentiment lead many firms to be mispriced in the same direction at the same time. Then, the *average* financing decision will contain information about the *average* (i.e., market level) mispricing, even though individual managers are perceiving and responding only to their *own* firm's mispricing".

Butler, Grullon, and Weston (2005a) question that timing ability or investor sentiment explain the predictive power of the equity share. They suggest that the apparent ability to time the market can be understood as a form of aggregate "pseudo market timing". They point out that on an ex-post basis equity share value tends to be high around market peaks and low around market troughs. Thus, it is the tendency to issue equity when prices are high that leads to a spurious relationship between equity share and future stock returns when measured ex post. They go on to argue that if equity tends to be issued when current prices are high, then equity issuance activity should go down during unexpected market declines—making pre-shock equity issuance look relatively high and post-shock equity issuance look relatively low. Thus, aggregate pseudo market timing should be most pronounced around market shocks. This prediction is supported by evidence that the predictive ability of the equity share is driven by the Great Depression (1920–1931) and the 1973–1974 Oil Crisis.

The main point in Butler, Grullon, and Weston (2005a) is that pseudo market timing can appear as real timing ability in small samples. Baker, Taliaferro, and Wurgler (2004) show that this problem extends to all time-series predictive regressions based on managerial decision variables. Moreover, it is a special case of the small sample bias studied

by, among others, Stambaugh (1986, 1999).[48] For example, when a financial ratio such as book-to-market is used as a predictive variable, it will "pseudo-time" the market since the book-to-market ratio is hard-wired to rise as the market falls. There is an extensive literature on how to estimate the bias that this causes in predictive regressions. Using simulations, Baker, Taliaferro, and Wurgler (2004) report that pseudo-timing accounts for less than two percent of the predictive power of the equity share. However, the role of the pseudo-timing when the econometrician also allows for a non-stationary economic environment remains to be determined.

The debate about what causes the apparent ability of firms to time their equity issues to periods that are followed by low market returns is still inconclusive. Rational explanations along the lines of Carlson, Fisher, and Giammarino (2005, 2006) and Pastor and Veronesi (2005) are interesting and consistent with the arguments and results of several papers that empirically investigate long-run performance following security offerings. Next we turn to an in depth review of this long-run stock return literature.

5.3. Evidence on long-run post-issue stock returns

Stocks generate surprisingly low returns over holding periods of 2–5 years following an equity issue date, as first shown for SEOs by Stigler (1964) and later reconfirmed and extended to IPOs by Ritter (1991) and more recent SEOs by Loughran and Ritter (1995). As discussed above, to some researchers, this long-run return evidence challenges the efficient markets hypotheses and motivates the development of behavioral asset pricing models. Responding to this challenge, Brav and Gompers (1997), Brav, Geczy, and Gompers (2000), Eckbo, Masulis, and Norli (2000), Eckbo and Norli (2005), and Lyandres, Sun, and Zhang (2005) present large-sample evidence that the low post-issue return pattern is consistent with standard multi-factor pricing models, and tend to be concentrated in small growth stocks with active investment programs. Thus, the low post-issue returns may be a manifestation of the more general finding in Fama and French (1992) that small growth stocks tend to exhibit low returns during the post-1963 period, or simply reflect the fact that asset pricing models have especially poor explanatory power for small growth stocks.

However, the proper interpretation of the low long-run returns following security issuances remains an unsettled issue. Ritter (2003) states that "the long-run performance evidence shows that in general the market underreacts to the [equity issue] announcements" (p. 262). Given the importance of the long-run performance evidence for the overall question of corporate timing and market efficiency, we provide a detailed review of the long-run performance evidence following IPOs, SEOs as well as corporate debt issues. We also report new updated abnormal return estimates of issuer abnormal returns

[48] See Baker, Taliaferro, and Wurgler (2004) for a more extensive list of papers that have studied this small sample bias.

based on security offerings made over the 1980–2001 sample period, and compare these to the extant literature.

5.3.1. Sample selection

The choice of sample period generally affects the statistical significance of reported abnormal return estimates.[49] Shorter sample periods reduce statistical power, while different sample periods have varying exposure to the problem of cross-correlation of overlapping holding-period returns (discussed extensively by Kothari and Warner (2007) in Chapter 1 of this volume). The literature uses security offer samples from as early as 1961 (Mitchell and Stafford, 2000) and as late as 2003 (Lyandres, Sun, and Zhang, 2005), with the bulk of the existing studies sampling from the 1980s and the early 1990s. The primary data source after 1980 is SDC, while earlier samples typically are found by searching the Wall Street Journal for issue announcements or relying on the SECs now defunct Registered Offerings of Securities database. Stock returns are almost always drawn from CRSP Daily Stock Price and Returns database.

Some authors exclude issues by public utilities on the grounds that the regulatory agencies make utility issues relatively predictable. Utility issues occurred on relatively frequent basis in the 1970s, and again as a result of deregulations in the late 1990s (Eckbo, Masulis, and Norli, 2000). As discussed above, the market reaction to SEOs is significantly smaller for utility issuers than for industrial issuers. Thus, it matters whether the utility issues are pooled in the long-run performance analysis. It is also customary to exclude issuers with stock price less than \$5, as well as unit offerings and simultaneous offerings of other securities. Issues by foreign corporations, closed-end funds, unit investment trusts, and real estate investment trusts are also customarily excluded. Moreover, most studies require data on book value of equity, taken from Compustat, which further reduces sample size.

Our sample selection for the long-run analysis below is as follows. We start with the overall sample of 80,627 security issues from Section 2.3 above. Recall that this sample already ensures that the issuing firm is found on the CRSP tape for the relevant period. We then exclude the following issues using information from SDC: (1) ADRs and GDRs, (2) simultaneous offerings of debt and equity, (3) simultaneous offerings of international issues, (4) unit offerings, (5) offers with missing SDC information on offering proceeds, and (6) offerings after year 2000. The last restriction ensures five years of post-issue stock return data. These six criteria reduces the total sample to 54,283. We then apply restrictions specific to CRSP: (7) CRSP share code must be either 10 or 11 (ordinary common shares), (8) the issuer must be listed on NYSE/AMEX/Nasdaq,

[49] Figure 3 in Eckbo and Norli (2005) presents a striking illustration of the impact of sample period on the average holding period return. Due to the slump in the stock market in the mid-1970s, a study of long-run returns following IPOs (which starts with the first Nasdaq IPOs in 1973), will easily conclude that the IPO portfolio underperform the *risk-free* rate if the sample period ends prior to the mid-1980s.

and (9) information on market value of equity must be available. This results in a total sample of 44,986.

The breakdown of the total sample of 44,986 offerings across different types of security offerings is shown below. The second column of numbers indicates the sample size when we also require the issuer to have Compustat information on equity book-to-market ratio (B/M). The latter constraint is imposed when we identify non-issuing firms matched on B/M.[50]

Sample for the survey's long-run analysis ($N = 44{,}986$)

Security type	Total	B/M available
IPO	5,907	5,403
SEO	6,698	6,285
Private placement of equity	506	506
Preferred equity	1,530	1,412
Convertible debt	1,157	897
Private placement of debt	9,584	8,584
Public straight debt issue	18,447	17,360

We start the abnormal return analysis using the matched firm technique which requires B/M information. We then report the results of risk adjustments using factor regressions of portfolios of issuing firms.

5.3.2. Cumulative buy-and-hold returns for issuers versus matched firms

The typical buy-and-hold experiment involves buying the issuing firm's stock in the month following the issue month, and holding the stock for a period of three to five years or until delisting, whichever comes first. In a sample of N issues, the average return over a holding period of T months is computed as the average cumulative (T-period) return, also referred to as $\overline{\text{BHR}}$ (for "buy-and-hold return"):

$$\overline{\text{BHR}} \equiv \frac{1}{\omega_i} \sum_{i=1}^{N} \left[\prod_{t=\tau_i}^{T_i} (1 + R_{it}) - 1 \right], \tag{6}$$

where R_{it} denotes the return to stock i over month t, and ω_i is stock i's weight in forming the average holding-period return ($\omega_i = 1/N$ when equal-weighting). The

[50] Book value is defined as "the Compustat book value of stockholders equity, plus balance sheet deferred taxes and investment tax credits (if available), minus the book value of preferred stock. Depending on availability, we use the redemption, liquidation, or par value (in that order) to estimate the value of preferred stock" (Fama and French, 1993, p. 8). If available on Compustat, the issuer book value of equity is also measured at the end of the year prior to the issue year. If this book value is not available, we use the first available book value on Compustat starting with the issue year and ending with the year following the issue year. On average, the first available book value is found 6.1 months after the offer date. Brav and Gompers (1997) look a maximum of 12 months ahead for book values while Brav, Geczy, and Gompers (2000) look a maximum of 18 months ahead.

effective holding period for stock i is T_i, where T_i in the analysis below is either five years or the time until delisting or the occurrence of a new SEO, whichever comes first. Kothari and Warner (1997), Barber and Lyon (1997) and Lyon, Barber, and Tsai (1999) provide simulation-based analyses of the statistical properties of test statistics based on long-run return metrics such as BHR. In Chapter 1 of this volume, Kothari and Warner (2007) survey the main statistical conclusions from this analysis.[51]

The matched-firm technique equates the *expected* return to issuing firms with the *realized* return to a non-issuing firm, usually matched on firm characteristics such as industry, size and book-to-market ratio. The abnormal or unexpected return BHAR is then

$$\text{BHAR}_{\text{Issuer}} \equiv \text{BHR}_{\text{Issuer}} - \text{BHR}_{\text{Matched firm}}. \tag{7}$$

Table 17 shows average five-year buy-and-hold returns following security offerings by U.S. firms that took place over the period 1980 through 2000, classified by the type of issuer.[52] As in Eckbo, Masulis, and Norli (2000) and Eckbo and Norli (2005), the matched firms are selected from all CRSP-listed companies at the end of the year prior to the issue-year and that are not in our sample of issuers for a period of five years prior to the offer date. We first select the subset of firms that have equity market values within 30% of the equity market value of the issuer. This subset is then ranked according to book-to-market ratios. The size and book-to-market matched firm is the firm with the book-to-market ratio, measured at the end of the year prior to the issue year, that is closest to the issuer's ratio. Matched firms are included for the full five-year holding period or until they are delisted, whichever occurs sooner. If a match delists, a new match is drawn from the *original* list of candidates described above.

[51] An alternative to $\overline{\text{BHR}}$ is to estimate the average monthly return to a strategy of investing in the stocks of issuers and hold these for up to T periods. The T-period return would then be formed as the *cumulative average* (portfolio) return, or

$$\overline{\text{CMR}} \equiv \prod_{t=\tau}^{T}\left[1 + \frac{1}{\omega_t}\sum_{i=1}^{N_t} R_{it}\right] - 1.$$

As noted by Kothari and Warner (2007), depending on the return generating process, the statistical properties of $\overline{\text{BHR}}$ and $\overline{\text{CMR}}$ can be very different. Notice also that while $\overline{\text{CMR}}$ represents the return on a feasible investment strategy, $\overline{\text{BHR}}$ does not. You obtain $\overline{\text{CMR}}$ by investing one dollar in the first security issue at the beginning of the sample period, and then successively rebalancing this initial investment to include subsequent issues as they appear (and N increases), all with a T-period holding period. In contrast, $\overline{\text{BHR}}$ is formed in event time—and thus presumes prior knowledge of the magnitude of N. Thus, estimates of $\overline{\text{CMR}}$ are better suited than estimates of $\overline{\text{BHR}}$ to address the question of whether investors have an incentive to take advantage of a potential market mispricing of security issues. Most of the empirical studies using the matched firm technique report results based on $\overline{\text{BHR}}$, which we follow here. In the subsequent section, however, we discuss portfolio benchmark returns based on asset pricing models, which uses the return concept $\overline{\text{CMR}}$ on a monthly basis, i.e., without the T-period cumulation.

[52] Utilities are firms with CRSP SIC codes in the interval [4910, 4939].

Table 17
Five-year buy-and-hold stock percent returns ($\overline{\text{BHR}}$) for U.S. issuers and size- and book-to-market matched control firms, 1980–2000

		Equally-weighted $\overline{\text{BHR}}$				Value-weighted $\overline{\text{BHR}}$			
Type of security issued	N	Issuer	Match	Diff	$p(t)$	Issuer	Match	Diff	$p(t)$
A. Issues by industrial firms ($N = 20{,}262$)									
Initial public offerings	5,018	35.7	53.8	−18.0	0.010	52.8	67.6	−14.8	0.208
Seasoned equity offerings	4,971	49.9	79.5	−29.7	0.000	79.8	105.7	−26.0	0.026
Private placement of equity	506	13.0	57.1	−44.1	0.000	31.1	54.1	−23.0	0.223
Preferred equity	379	43.8	96.7	−52.9	0.000	79.1	113.6	−34.5	0.238
Convertible debt	897	46.5	86.9	−40.4	0.006	46.5	83.6	−37.1	0.068
Private placement of debt	4,228	76.0	89.2	−13.2	0.002	87.0	97.0	−10.0	0.282
Straight debt	4,263	77.6	94.6	−17.0	0.000	71.2	88.0	−16.8	0.000
B. Issues by banks and financial institutions ($N = 16{,}521$)									
Initial public offerings	385	71.7	51.1	20.6	0.154	112.1	50.7	61.5	0.233
Seasoned equity offerings	655	98.3	98.3	0.0	0.999	75.6	73.4	2.3	0.870
Preferred equity	573	104.6	72.1	32.5	0.000	59.5	48.3	11.1	0.310
Private placement of debt	3,478	138.0	86.5	51.5	0.000	102.4	50.4	52.0	0.000
Straight debt	11,430	116.0	76.9	39.2	0.000	88.2	40.5	47.8	0.000
C. Issues by public utilities ($N = 3{,}664$)									
Seasoned equity offerings	659	116.3	135.4	−19.1	0.012	100.6	132.9	−32.3	0.010
Preferred equity	460	79.4	103.0	−23.5	0.000	70.4	85.1	−14.7	0.104
Private placement of debt	878	87.2	95.2	−8.0	0.270	44.0	70.6	−26.6	0.002
Straight debt	1,667	75.0	92.9	−17.9	0.000	63.7	80.7	−17.0	0.001

Buy-and-hold percent returns are defined as:

$$\overline{\text{BHR}} \equiv \omega_i \sum_{i=1}^{N} \left[\prod_{t=\tau_i}^{T_i} (1 + R_{it}) - 1 \right] \times 100.$$

When equal-weighting, $\omega_i \equiv 1/N$, and when value-weighting, $\omega_i = MV_i/MV$, where MV_i is the issuer's common stock market value (in 1999 dollars) at the start of the holding period and $MV = \sum_i MV_i$. The abnormal buy-and-hold returns shown in the column marked "Diff" represent the difference between the $\overline{\text{BHR}}$ in the "Issuer" and "Match" columns. The rows marked "N" contain number of issues. The p-values for equal-weighted abnormal returns are p-values of the t-statistic using a two-sided test of no difference in average five-year buy-and-hold returns for issuer and matching firms. The p-values for the value-weighted abnormal returns are computed using $U \equiv \omega' x/(\sigma\sqrt{\omega'\omega})$, where ω is a vector of value weights and x is the corresponding vector of differences in buy-and-hold returns for issuer and match. Assuming that x is distributed normal $N(\mu, \sigma^2)$ and that σ^2 can be consistently estimated using $\sum_i \omega_i (x_i - \bar{x})^2$, where $\bar{x} = \sum_i \omega_i x_i$, U is distributed $N(0, 1)$.

Table 17 shows issuers on average underperform their matched firms when $\overline{\text{BHR}}$ is formed using equal-weights. For industrial issuers (Panel A), the five-year differ-

ence in the buy-and-hold returns of issuers and matched firms ranges from −52.0% for preferred equity placements ($N = 379$) to −13.2% for private placements of debt ($N = 4{,}228$). For IPOs ($N = 5{,}018$), the difference in buy-and-hold returns is −18.0% and −29.7% for SEOs ($N = 4{,}971$). Straight debt issues ($N = 4{,}263$) are associated with a difference in $\overline{\text{BHR}}$ of −17.0% while the return difference is 40.4% for convertible debt issues ($N = 897$). All return differences are statistically difference from zero at the one percent level.

Going from equal-weighting to value-weighting the returns alters the results dramatically. With value-weights, none of the differences are statistically different from zero at the one percent level, with the exception of *straight debt* issues (p-value of 0.000). Moreover, SEOs underperform their matched firms with a p-value of 0.026. Since value-weighting gives additional weight to above-average successful firms (relative to equal-weighting), the reduction in underperformance is expected. However, the fact that straight debt issuers in the value-weighted category reliably underperform matched firms while most other equity-type of issues do not is surprising.

Turning to security issuers by banks and financial institutions, there is no evidence of underperformance and some evidence of significant overperformance relative to the matched firms. With equal-weighting, financial issuers outperform matched firms when issuing preferred equity ($N = 573$) and straight debt placed either publicly ($N = 11{,}430$) or privately ($N = 3{,}478$). Value-weighting has almost no impact on the performance measure, except that preferred equity is no longer associated with abnormal performance relative to the matched firms.

As shown in the third panel of Table 17, issues by public utility companies produce underperformance similar to that of industrial issuers. The exception is private placements of equity ($N = 878$) which produces statistically insignificant underperformance for the equal-weighted buy-and-hold measure. Private placements do, however, significantly underperform using the value-weighted measure, as do SEOs ($N = 659$) and issuers of straight debt ($N = 1{,}667$).

Table 18 lists published studies that present evidence on buy-and-hold returns for several of the security sales in Table 17. For IPOs, and consistent with the results in Table 17, the studies of Brav, Geczy, and Gompers (2000), Ritter and Welch (2002) and Eckbo and Norli (2005) show insignificant abnormal returns over both three-year and five-year time horizons. For SEOs, the studies with the largest samples are Jegadeesh (2000), Brav, Geczy, and Gompers (2000), Eckbo, Masulis, and Norli (2000) and Clarke, Dunbar, and Kahle (2001). These show evidence of significant negative performance (3-year or 5-year), ranging from −4% to −34%. This is consistent with the −30% abnormal buy-and-hold return for the SEOs in Table 17. There is also negative, relative performance following private placements of equity (Hertzel et al., 2002; Krishnamurthy et al., 2005). Interestingly, Krishnamurthy et al. (2005) show that investors who participate in the private placement discount realize a normal post-issue, long-run performance.

Turning to debt offerings, with the exception of Eckbo, Masulis, and Norli (2000), there is consistent evidence of negative performance following convertible debt issues

Table 18
Average difference in equal-weighted buy-and-hold returns for U.S. issuers ($\overline{\text{BHR}}_i$) and size- and book-to-market matched control firms ($\overline{\text{BHR}}_m$)

Study	Issuer type	Sample size	Sample period	Holding period	$\overline{\text{BHR}}_i - \overline{\text{BHR}}_m$
A. IPOs					
Brav and Gompers (1997)	All	3,407	1972–1992	5 yrs	1.9%[a]
Brav and Gompers (1997)	All	934	1972–1992	5 yrs	16.5%*[b]
Brav, Geczy, and Gompers (2000)	All	3,501	1975–1992	5 yrs	6.6%
Ritter and Welch (2002)	All	6,249	1980–2001	3 yrs	−5.1%
Eckbo and Norli (2005)	All	5,365	1972–1998	5 yrs	−2.4%
B. SEOs					
Spiess and Affleck-Graves (1995)	All	1,247	1975–1989	3 yrs	−22.8%*
Lee (1997)	All	1,513	1976–1990	3 yrs	−20.3%*[c]
Jegadeesh (2000)	All	2,992	1970–1993	5 yrs	−34.3%*
Brav, Geczy, and Gompers (2000)	All	3,775	1975–1992	5 yrs	−26.3%*
Eckbo, Masulis, and Norli (2000)	Ind	3,851	1964–1995	5 yrs	−23.2%*
Kahle (2000)	Ind	1,739	1981–1992	3 yrs	−14.7%*
Clarke, Dunbar, and Kahle (2001)	All	3,092	1984–1996	3 yrs	−14.3%*[d]
Clarke, Dunbar, and Kahle (2001)	All	174	1984–1996	3 yrs	−3.3%*[e]
C. Private placements of equity					
Hertzel et al. (2002)	All	591	1980–1996	3 yrs	−23.8*
Krishnamurthy et al. (2005)	All	275	1983–1992	3 yrs	−38.4%*[f]
Krishnamurthy et al. (2005)	All	273	1983–1992	3 yrs	−1.24%[g]
D. Straight debt offerings					
Spiess and Affleck-Graves (1999)	All	392	1975–1989	5 yrs	−14.3%
Kahle (2000)	Ind	523	1981–1992	3 yrs	−9.5%
Eckbo, Masulis, and Norli (2000)	Ind	981	1964–1995	5 yrs	−11.2%
Eckbo, Masulis, and Norli (2000)	Util	348	1964–1995	5 yrs	−10.4%*
Butler and Wan (2005)	Ind	799	1975–1999	5 yrs	−24.0%*[h]

(*Continued on next page*)

(Lee and Loughran, 1998; Spiess and Affleck-Graves, 1999; Kahle, 2000; Lewis, Rogalski, and Seward, 2001). For straight debt offerings, however, the literature shows insignificant long-run performance (Spiess and Affleck-Graves, 1999; Kahle, 2000, and industrial issuers in Eckbo, Masulis, and Norli, 2000). This contrasts with the results in Table 17 where debt issuers significantly underperform non-issuing matched firms. While the magnitudes of the abnormal returns are similar for straight debt issues in Table 17 and Table 18, the much larger sample size in Table 17 appears to provide greater precision, causing the null of zero abnormal performance to be rejected at the 0.1% level or better.

Measurement problems aside, underperformance following straight debt issues represents an enigma: there is little adverse selection as the choice of debt over equity is

Table 18
(*Continued*)

Study	Issuer type	Sample size	Sample period	Holding period	$\overline{\text{BHR}}_i - \overline{\text{BHR}}_m$
E. Convertible debt offerings					
Spiess and Affleck-Graves (1999)	All	400	1975–1989	5 yrs	−37.0%*
Lee and Loughran (1998)	All	986	1975–1990	5 yrs	−30.4%*
Eckbo, Masulis, and Norli (2000)	Ind	459	1964–1995	5 yrs	−16.1%
Kahle (2000)	Ind	527	1981–1992	3 yrs	−18.1%*
Lewis, Rogalski, and Seward (2001)	All	566	1979–1990	5 yrs	−26.5%*
Butler and Wan (2005)	Ind	303	1975–1999	5 yrs	−24.0%*[h]

Buy-and-hold percent returns are defined as:

$$\overline{\text{BHR}} \equiv \frac{1}{N}\sum_{i=1}^{N}\left[\prod_{t=\tau_i}^{T_i}(1+R_{it})-1\right]\times 100.$$

Superscript * indicates significantly different from zero at the 1% level.

[a]Sample of non-venture-backed IPOs.

[b]Sample of venture-backed IPOs.

[c]Sample of primary issues. Matching firms are matched on size, book-to-market and prior annual return.

[d]Sample of completed SEOs.

[e]Sample of cancelled SEOs.

[f]Returns to non-participating investors (who do not buy shares in the private placement).

[g]Returns to participating investors (those who also capture the discount in the offering).

[h]Abnormal returns are insignificant when also matching on liquidity.

often thought to be associated with managerial beliefs that the firm's future earnings prospects are good (e.g., Ross, 1977). So why would debt issuers underperform non-issuing firms matched on size and B/M? Moreover, why would this underperformance be close to the magnitude for SEOs? The answer may reflect a combination of statistical problems with buy-and-hold return $\overline{\text{BHR}}$, as well as the matched firm technique producing the wrong benchmark for measuring the true systematic risk of issuing firms. In the subsequent section, we address this issue by measuring abnormal performance to issuing firms using both a monthly return horizon and a risk adjustment emanating from factor regressions.

Eckbo and Norli (2005) also examine the frequency of company delistings from the stock exchange due to bankruptcy/liquidation over the five-year period following IPOs. The idea is that low post-issue returns may be driven by a greater exit due to bankruptcy/liquidation compared to the rate for the matched firms. However, they find no evidence that the rate of bankruptcy/liquidations (or delisting due to takeover) differs across issuer and their matches.

5.3.3. Average monthly abnormal returns using factor pricing regressions

In this section, we use empirical asset pricing models to generate portfolio expected returns. An asset pricing model is estimated using monthly returns, with the intercept term in the pricing model (also referred to as "Jensen's alpha" from Jensen (1968), or simply α) as the measure of the average monthly abnormal return. The most commonly used empirical asset pricing models in this literature are of the multi-factor (APT) type in general, and the three-factor model of Fama and French (1993) in particular.[53]

The factor pricing analysis proceeds as follows. Let r_{pt} denote the return on issuer–portfolio p in excess of the risk-free rate, and assume that expected excess returns are generated by a K-factor model,

$$E(r_{pt}) = \beta_p' \lambda, \tag{8}$$

where β_p is a K-vector of risk factor sensitivities (systematic risks) and λ is a K-vector of expected risk premiums. The return generating process can be written as

$$r_{pt} = E(r_{pt}) + \beta_p' f_t + e_{pt}, \tag{9}$$

where f_t is a K-vector of risk factor shocks and e_{pt} is the portfolio's idiosyncratic risk with expectation zero. The factor shocks are deviations of the factor realizations from their expected values, i.e., $f_t \equiv F_t - E(F_t)$, where F_t is a K-vector of factor realizations and $E(F_t)$ is a K-vector of factor expected returns.

Regression equation (9) requires specification of $E(F_t)$, which is generally unobservable. To get around this issue, it is common to replace the raw factors F with factor mimicking portfolios. Specifically, consider the excess return r_{kt} on a portfolio that has unit factor sensitivity to the kth factor and zero sensitivity to the remaining $K-1$ factors. Since this portfolio must also satisfy equation (8), it follows that $E(r_{kt}) = \lambda_k$. Thus, when substituting a K-vector r_{Ft} of the returns on factor-mimicking portfolios for the raw factors F, equations (8) and (9) imply the following regression equation in terms of observables:

$$r_{pt} = \beta_p' r_{Ft} + e_{pt}. \tag{10}$$

Equation (10) generates portfolio p's returns, and inserting a constant term α_p yields the alpha measure of abnormal return.

We estimate alphas using two models which include the Fama and French (1993) factors as well as two additional characteristics-based risk factors:

$$r_{pt} = \begin{cases} \alpha_p + \beta_1 \,\mathrm{RM} + \beta_2 \,\mathrm{SMB}_t + \beta_3 \,\mathrm{HML}_t + e_t, \\ \alpha_p' + \beta_1 \,\mathrm{RM} + \beta_2 \,\mathrm{SMB}_t + \beta_3 \,\mathrm{HML}_t + \beta_4 \,\mathrm{UMD} + \beta_5 \,\mathrm{LMH} + e_t, \end{cases} \tag{11}$$

where r_{pt} is the excess return to an equal-weighted portfolio of issuers, RM is the excess return on the CRSP value weighted market index. SMB and HML are the Fama and

[53] See, e.g., Connor and Korajczyk (1995) and Ferson (2003) for extensive surveys of multifactor models.

French (1993) size and book-to-market factors. UMD is a momentum factor inspired by Carhart (1997) and constructed as the returns difference between the one-third highest and the one-third lowest CRSP performers over the past 12 months. LMH is the Eckbo and Norli (2005) turnover factor, defined as a portfolio long in low-turnover stocks and short in high-turnover stocks.

The alpha estimates are reported in Table 19 for equity issuers, and Table 20 for debt issuers. As first reported by Eckbo and Norli (2005), the estimated coefficients on the turnover factor LMH tend to be both a greater and more significant than the coefficients on the momentum factor UMD. When the coefficient on LMH is significant, the extended model increases the regression R^2 marginally above the Fama–French model. Moreover, when significant, the estimated coefficients on both UMD and LMH are typically negative, indicating that issuers tend to be relatively liquid, growth stocks.

When using the Fama–French model, the alphas are significant and negative for private placements of equity (panel F of Table 19) and for private placements of straight debt (panels D and F in Table 20). However, the alpha estimates are insignificant in all samples when using the extended model. There is ample evidence that the momentum factor UMD helps explain the cross-section of expected stock returns. Evidence that the turnover factor LMH is also priced is found in Eckbo and Norli (2002 and 2005). Assuming UMD and LMH are indeed priced risk factors, then the results in Table 19 and Table 20 fail to reject the hypothesis of zero post-issue abnormal performance.

Table 21 shows the alpha estimates reported in much of the literature that uses factor regressions to estimate post-issue abnormal performance. For IPOs, and with the exception of non-venture-backed IPOs studied by Brav and Gompers (1997), the alphas are statistically insignificantly different from zero (Brav, Geczy, and Gompers, 2000; Ritter and Welch, 2002; Eckbo and Norli, 2005). For SEOs, and with the exception of Jegadeesh (2000), all large-sample studies (3,000+ SEOs) also report insignificant alphas. These include Brav, Geczy, and Gompers (2000), Eckbo, Masulis, and Norli (2000), and Lyandres, Sun, and Zhang (2005). For portfolios of SEOs, the Fama–French model tend to produce larger (and sometimes significant) alphas than extended models adding UMD, LMH and, most recently, the investment factor of Lyandres, Sun, and Zhang (2005). Overall, assuming these factors are priced, the null of zero abnormal post-SEO performance is not rejected.

Finally, studies of debt issues also find alphas that are indistinguishable from zero. The largest sample is found in Eckbo, Masulis, and Norli (2000), who study a total of 1,329 straight debt issues and 459 convertible debt offerings, report insignificant alpha estimates for both types of debt issues. Spiess and Affleck-Graves (1999) report significantly negative alphas for a constrained sample of debt issuers, where issues by a given company that take place within five years of each other are excluded. However, Butler and Wan (2005) show that adding a liquidity factor (much like the turnover factor of Eckbo and Norli (2005) produces insignificant alpha estimates also for the type of restricted sample used by Spiess and Affleck-Graves (1999). Thus, again assuming

Table 19
Monthly abnormal equal-weighted portfolio return (α_p) following IPOs, SEOs, and equity private placements (PPEs), 1980–2000

α_p	RM	SMB	HML	UMD	LMH	R^2
A. Sample of 5,128 IPOs by industrial firms						
−0.16 (0.492)	1.14 (0.000)	1.17 (0.000)	−0.29 (0.006)			0.838
0.25 (0.416)	0.95 (0.000)	1.03 (0.000)	−0.27 (0.020)	−0.19 (0.061)	−0.53 (0.006)	0.863
B. Sample of 779 IPOs by banks and financial firms						
−0.10 (0.695)	1.09 (0.000)	0.75 (0.000)	0.61 (0.000)			0.616
0.03 (0.922)	1.06 (0.000)	0.74 (0.000)	0.60 (0.000)	−0.10 (0.278)	−0.06 (0.726)	0.618
C. Sample of 5,127 SEOs by industrial issuers						
−0.18 (0.167)	1.20 (0.000)	0.92 (0.000)	−0.11 (0.057)			0.923
0.18 (0.125)	1.04 (0.000)	0.80 (0.000)	−0.09 (0.073)	−0.17 (0.000)	−0.45 (0.000)	0.949
D. Sample of 878 SEOs by banks and financial firms						
−0.16 (0.378)	1.12 (0.000)	0.52 (0.000)	0.77 (0.000)			0.720
−0.09 (0.650)	1.10 (0.000)	0.51 (0.000)	0.77 (0.000)	−0.05 (0.421)	−0.05 (0.650)	0.720
E. Sample of 693 SEOs by public utilities						
0.06 (0.744)	0.62 (0.000)	0.05 (0.374)	0.65 (0.000)			0.458
−0.08 (0.644)	0.74 (0.000)	0.15 (0.008)	0.61 (0.000)	0.01 (0.829)	0.34 (0.002)	0.481
F. Sample of 506 PPEs by industrial issuers						
−0.48 (0.066)	1.15 (0.000)	1.14 (0.000)	−0.37 (0.001)			0.783
−0.04 (0.884)	1.03 (0.000)	1.11 (0.000)	−0.40 (0.000)	−0.32 (0.000)	−0.21 (0.178)	0.811

Starting in February 1980, a firm is added to the portfolio in the month following the month of the IPO and held for five years or until delisting (if sooner). The IPO sampling stops in 12/2000 while the abnormal return estimation ends in December 2002. Abnormal returns are estimated using the following asset pricing model:

$$r_{pt} = \alpha_p + \beta_1 \,\mathrm{RM} + \beta_2 \,\mathrm{SMB}_t + \beta_3 \,\mathrm{HML}_t + \beta_4 \,\mathrm{UMD} + \beta_5 \,\mathrm{LMH} + e_t,$$

where r_{pt} is the portfolio excess return, RM is the excess return on the CRSP value weighted market index, SMB and HML are the Fama and French (1993) size and book-to-market factors, UMD is a momentum factor constructed as the returns difference between the one-third highest and the one-third lowest CRSP performers over the past 12 months, and LMH is the Eckbo and Norli (2005) turnover factor (a portfolio long in low-turnover stocks and short in high-turnover stocks). The coefficients are estimated using OLS. Standard errors are computed using the heteroskedasticity consistent estimator of White (1980). The numbers in parentheses are p-values. R^2 is the adjusted R-squared.

liquidity is a priced risk factor, one cannot reject the null of zero abnormal performance following debt offerings by U.S. firms.[54]

[54] Brav et al. (2005) examine institutional lender pricing of (private) loans to equity-issuing firms. They report lower loan yields for equity-issuers relative to non-issuing firms. This is further evidence consistent with the proposition that the relatively low post-issue equity returns reflect lower risk.

Table 20
Monthly abnormal equal-weighted portfolio return (α_p) following public (SDOs) and private (PPDs) offerings of straight debt, 1980–2000

α_p	RM	SMB	HML	UMD	LMH	R^2
A. Sample of 4,546 SDOs by industrial issuers						
−0.16 (0.116)	1.12 (0.000)	0.10 (0.100)	0.43 (0.000)			0.887
0.04 (0.674)	1.05 (0.000)	0.06 (0.217)	0.42 (0.000)	−0.13 (0.000)	−0.16 (0.018)	0.906
B. Sample of 12,191 SDOs by banks and financial firms						
0.04 (0.820)	1.32 (0.000)	−0.05 (0.469)	0.68 (0.000)			0.798
0.21 (0.233)	1.28 (0.000)	−0.07 (0.354)	0.66 (0.000)	−0.13 (0.009)	−0.08 (0.486)	0.807
C. Sample of 1,710 SDOs by public utilities						
−0.03 (0.865)	0.65 (0.000)	−0.11 (0.093)	0.70 (0.000)			0.444
−0.18 (0.387)	0.79 (0.000)	0.02 (0.796)	0.64 (0.000)	−0.01 (0.774)	0.43 (0.001)	0.472
D. Sample of 4,730 PPDs by industrial issuers						
−0.29 (0.021)	1.18 (0.000)	0.48 (0.000)	0.43 (0.000)			0.887
0.06 (0.654)	1.04 (0.000)	0.40 (0.000)	0.42 (0.000)	−0.21 (0.000)	−0.31 (0.000)	0.931
E. Sample of 3,931 PPDs by banks and financial firms						
−0.08 (0.691)	1.44 (0.000)	0.28 (0.004)	0.65 (0.000)			0.770
0.13 (0.543)	1.32 (0.000)	0.19 (0.057)	0.67 (0.000)	−0.07 (0.165)	−0.33 (0.030)	0.780
F. Sample of 923 PPDs by public utilities						
−0.29 (0.021)	1.18 (0.000)	0.48 (0.000)	0.43 (0.000)			0.887
−0.24 (0.319)	0.80 (0.000)	0.05 (0.529)	0.66 (0.000)	−0.03 (0.708)	0.28 (0.052)	0.444

Starting in February 1980, a firm is added to the portfolio in the month following the month of the SDO and held for the minimum of five years and its delisting date. The SDO sampling stops in 12/2000 while the abnormal return estimation ends in December 2002. Abnormal returns are estimated using the following asset pricing model:

$$r_{pt} = \alpha_p + \beta_1 \,\mathrm{RM} + \beta_2 \,\mathrm{SMB}_t + \beta_3 \,\mathrm{HML}_t + \beta_4 \,\mathrm{UMD} + \beta_5 \,\mathrm{LMH} + e_t$$

where r_{pt} is the portfolio excess return, RM is the excess return on the CRSP value weighted market index, SMB and HML are the Fama and French (1993) size and book-to-market factors, UMD is a momentum factor constructed as the returns difference between the one-third highest and the one-third lowest CRSP performers over the past 12 months, and LMH is the Eckbo and Norli (2005) turnover factor (a portfolio long in low-turnover stocks and short in high-turnover stocks). The coefficients are estimated using OLS. Standard errors are computed using the heteroskedasticity consistent estimator of White (1980). The numbers in parentheses are p-values. R^2 is the adjusted R-squared.

5.4. Robustness issues

The matched-firm technique discussed above uses firm characteristics (size and B/M) to adjust for priced risks, while the factor regression approach uses a set of prespeci-

Table 21
Average monthly abnormal equal-weighted portfolio return (α) for three-to-five year holding periods following securities offerings by U.S. firms

Study	Issuer type	Sample size	Sample period	Holding period	α
A. IPOs					
Brav and Gompers (1997)	All	3, 407	1972–1992	5 yrs	−0.49%*[a]
Brav and Gompers (1997)	All	934	1972–1992	5 yrs	0.09%[b]
Brav, Geczy, and Gompers (2000)	All	3, 501	1975–1992	5 yrs	−0.19%
Ritter and Welch (2002)	All	6, 249	1973–2001	3 yrs	−0.21%
Eckbo and Norli (2005)	All	5, 365	1972–1998	5 yrs	0.40%[c]
Eckbo and Norli (2005)	All	5, 365	1972–1998	5 yrs	0.18%[d]
B. SEOs					
Jegadeesh (2000)	All	2, 992	1970–1993	5 yrs	−0.31%*
Brav, Geczy, and Gompers (2000)	All	3, 775	1975–1992	5 yrs	−0.19%
Eckbo, Masulis, and Norli (2000)	Ind	3, 315	1964–1995	5 yrs	−0.05%[d]
Eckbo, Masulis, and Norli (2000)	Ind	3, 315	1964–1995	5 yrs	−0.14%[e]
Eckbo, Masulis, and Norli (2000)	Util	880	1964–1995	5 yrs	−0.13%[d]
Bayless and Jay (2003)	Ind	1, 239	1971–1995	5 yrs	−0.54%*
Krishnamurthy et al. (2005)	All	1, 477	1983–1992	3 yrs	−0.36%*
Eckbo and Norli (2005)	Ind	1, 704	1964–1995	5 yrs	−0.03%[c]
Lyandres, Sun, and Zhang (2005)	All	6, 122	1970–2003	3 yrs	0.02%[f]
D'Mello, Schlingemann, and Subramaniam (2005)	All	1, 621	1982–1995	3 yrs	−0.31%*
C. Private placements of equity					
Hertzel et al. (2002)	All	619	1980–1996	3 yrs	−1.18%*
Krishnamurthy et al. (2005)	All	276	1983–1992	3 yrs	−0.77%*
D. Straight debt offerings					
Spiess and Affleck-Graves (1999)	All	392	1975–1989	5 yrs	−0.29%*
Eckbo, Masulis, and Norli (2000)	Ind	981	1964–1995	5 yrs	−0.10%
Eckbo, Masulis, and Norli (2000)	Util	348	1964–1995	5 yrs	−0.22%
Butler and Wan (2005)	Ind	799	1975–1999	5 yrs	−0.18%[g]

(*Continued on next page*)

fiedportfolios as proxies for pervasive risks. Either approach suffers from potential "bad model" problems in terms of representing the true asset pricing model. Since tests for abnormal returns are always a joint test of the risk factors assumed to generate expected return, it is therefore useful to provide information on the sensitivity of abnormal return estimates to alternative model specifications. Moreover, factor regressions may suffer from non-stationarity in the estimated parameters that may be predictable using publicly available information. Also, Loughran and Ritter (2000) point out that the factor mimicking portfolios used in the regressions for estimating alphas contain issuing firms, and they argue that this "contamination" may reduce the power of the tests.

Table 21
(*Continued*)

Study	Issuer type	Sample size	Sample period	Holding period	α
E. Convertible debt offerings					
Spiess and Affleck-Graves (1999)	All	400	1975–1989	5 yrs	−0.31*
Eckbo, Masulis, and Norli (2000)	Ind	459	1964–1995	5 yrs	−0.31%

The table reports the time-series estimate of the constant term α resulting from regressing the excess return on a portfolio of issuing firms on a set of pricing factors in an empirical asset pricing model. The issuer portfolio is formed using equal-weights. The issuer's stock typically enters the portfolio in the month following the issue month, and is held from three to five years. Superscript * indicates that the α is statistically significantly different from zero at the 1% level.
[a]Sample of non-venture-backed IPOs.
[b]Sample of venture-backed IPOs.
[c]Pricing model with Fama–French, momentum and liquidity factors.
[d]Pricing model with macroeconomic risk factors.
[e]Pricing model with Fama–French factors.
[f]Pricing model with Fama–French, momentum and investment factors.
[g]Pricing model with Fama–French and liquidity factors.

Eckbo, Masulis, and Norli (2000) examine these robustness issues for their sample of SEOs and debt issues. Below, we discuss their approach, repeat their analysis using our data, and draw qualitative inferences.[55] Overall, this discussion serves to illustrate that the main conclusion of zero long-run abnormal performance following issue-activity is robust.

5.4.1. Alternative and omitted risk factors

The matched-firm technique. The matched-firm technique produces evidence of abnormal post-issue stock returns while the factor regression approach does not. This raises the question of whether the characteristics-based matched-firm technique omits priced risk factors. To check this, Eckbo, Masulis, and Norli (2000) and Eckbo and Norli (2005) estimate the abnormal return (alpha) to a zero-investment portfolio that is long in issuer stocks and short in matched firms. This portfolio controls for any omitted risk factor with identical factor betas across issuer and matched firm, effectively combining the two standard matched-firm and asset pricing techniques.

To illustrate, suppose the true set of risk factors is given by the vector F, and that only a subset F_1 of this vector is included in the regression model, with the complement vector F_2 omitted. Let I denote issuer and M matched firm. The "issuer–match"

[55] Detailed results are available upon request.

regression is then

$$r_I - r_M = (\alpha_I - \alpha_M) + (\beta_{1I} - \beta_{1M})F_1 + \epsilon, \tag{12}$$

where $\epsilon = (\beta_{2I} - \beta_{2M})F_2 + u$, where u is a white noise error term. The definition of a "good match" is that β_I is close to β_M. For example, if the size and B/M matching often used in the literature in fact produces a good match, then you expect the "issuer–match" regression to have both a small alpha and values of beta close to zero. Alternatively, if the matching technique fails to control for important risk factors, then the zero-investment "issuer–match" portfolio will contain significant factor loadings.

Eckbo, Masulis, and Norli (2000) (SEOs and debt offerings), Eckbo and Norli (2005) (IPOs), and this survey (all issue categories) all lead to the conclusion that the zero-investment portfolio exhibit significant factor loadings in the extended Fama–French model, but that the alpha of this portfolio is not significantly different from zero. This is consistent with the proposition that the technique of matching on size and B/M is insufficient to control for important risk exposures of the issuing firms. Lyandres, Sun, and Zhang (2005) reach a similar conclusion for their sample of SEOs after performing a three-way sort of size, B/M and investment intensity.

Alternative factor structures. Eckbo, Masulis, and Norli (2000) use a model with six prespecified macro factors: the value-weighted CRSP market index, and factor mimicking portfolios for the return spread between Treasury bonds with 20-year and one-year maturity, the return spread between 90-day and 30-day Treasury bills, the seasonally adjusted percent change in real per capita consumption of nondurable goods, the difference in the monthly yield change on BAA-rated and AAA-rated corporate bonds, and unexpected inflation.[56] This six-factor model produce regression R^2 similar to the Fama–French model, and the alphas are uniformly indistinguishable from zero.

Eckbo, Masulis, and Norli (2000) also report alpha estimates when the time series of the demeaned, raw macroeconomic factors is used rather than factor-mimicking portfolios. Raw macro factor shocks are interesting in part because they are not affected by stock market mispricing (if any). Also, factor-mimicking portfolios contain measurement error vis-à-vis the true risk factors, which raw factors avoid. On the other hand, there is measurement error induced by the demeaned raw macroeconomic factors themselves. It is difficult to determine a priori which of the two sources of measurement error is most severe (and thus whether factor mimicking is superior).[57] In any event, the alpha estimates remain insignificantly different from zero, though somewhat larger in absolute value than those for regressions based on factor-mimicking portfolios.[58]

[56] These factors also appear in, Ferson and Harvey (1991), Evans (1994), Ferson and Korajczyk (1995), Ferson and Schadt (1996), and Eckbo and Smith (1998) among others.

[57] Factor mimicking portfolios are required when estimating risk premiums (denominated in returns).

[58] Eckbo, Masulis, and Norli (2000) report that a similar conclusion emerges when alpha is estimated using factors extracted from the covariance matrix of returns using the principal components approach of Connor and Korajczyk (1988). Although principal component factors do not have intuitive economic interpretations, they provide yet another factor structure useful for sensitivity analysis.

5.4.2. Time-varying factor loadings

Nonstationary factor loadings may produce (i) significant performance in subperiods, (ii) predictable changes in factor loadings which affect the alpha estimates, and (iii) significant effect of using value-weighted instead of equal-weighted issuer portfolios.

Nonstationarities. Eckbo, Masulis, and Norli (2000) examine holding periods of between one and five years. For example, with a two-year holding period, firms enter the SEO issuer portfolio as before, but exit after only two years (or at a subsequent security offer or delisting, whichever occurs earlier). This serves to check whether any subperiod abnormal performance is washed out in the averaging of returns over the five-year holding period. The conclusion emerging from the analysis of one-to-five-year holding periods remain the same: none of the alphas are significantly different from zero.

Eckbo, Masulis, and Norli (2000) also reestimate alphas using factor-mimicking portfolios that are continuously updated. That is, the portfolio weights are constructed using a rolling estimation period where the factor loadings are reestimated every month. This rolling estimation procedure relaxes the stationarity assumption on the factor-mimicking weights. The alphas are again all insignificant.

Predictable changes in factor loadings. Eckbo, Masulis, and Norli (2000) and Eckbo and Norli (2005) reexamine the null hypothesis of zero abnormal performance using a conditional factor model framework.[59] They follow Ferson and Schadt (1996) and assume that factor loadings are linearly related to a set of L known information variables Z_{t-1}:

$$\beta_{1pt-1} = b_{p0} + B_{p1} Z_{t-1}. \tag{13}$$

Here, b_{p0} is a K-vector of "average" factor loadings that are time-invariant, B_{p1} is a $(K \times L)$ coefficient matrix, and Z_{t-1} is an L-vector of information variables (observables) at time $t-1$. The product $B_{p1} Z_{t-1}$ captures the predictable time variation in the factor loadings. After substituting equation (13) into equation (10), the return-generating process becomes

$$r_{pt} = b'_{p0} r_{Ft} + b'_{p1}(Z_{t-1} \otimes r_{Ft}) + e_{pt}, \tag{14}$$

where the KL-vector b_{p1} is $\text{vec}(B_{p1})$ and the symbol $\otimes$ denotes the Kronecker product.[60] This factor model is estimated after adding a constant term α_p, which equals zero under the null hypothesis of zero abnormal returns. The information variables in Z_{t-1} include the lagged dividend yield on the CRSP value-weighted market index, the lagged 30-day Treasury bill rate, and the lagged values of the credit and yield curve spreads, BAA–AAA and TBILLspr, respectively. The alpha estimates all remain insignificantly different from zero.

[59] A survey of conditional factor model econometrics is found in Ferson (1995).

[60] The operator $\text{vec}(\cdot)$ vectorizes the matrix argument by stacking each column starting with the first column of the matrix.

Value-weighted issuer portfolios. The results reported above are based on equal-weighted issuer portfolios. With value-weights, relatively successful firms gradually increase their portfolio weights. If the relatively low return of issuers is driven by "losers", then value-weighting increases the average portfolio return and possibly the abnormal performance parameter alpha. The literature is fairly unanimous on this issue: alphas with value-weighted issuer portfolios appears less negative than for equal-weighted portfolios, and they sometimes provide evidence of issuer *over*performance relative to matched firms.

5.4.3. Issue-purged factors

Loughran and Ritter (2000) argue that it is counterproductive to generate factor-mimicking portfolios without excluding security issuers from the stock universe. Inclusion of security issuers in the factor portfolios results in the factor regressions having the same firm on both sides of the regression (albeit with a small weight in the factor portfolio). They argue that this substantially reduces power to detect abnormal return via the estimated alpha.

Note that, under the null hypothesis of zero abnormal performance, purging the factor-mimicking portfolios for ex post issuing firms biases the tests in favor of finding a significant alpha. This, of course, means that failing to reject the null hypothesis even with purged factor portfolios *a fortiori* supports the market efficiency hypothesis over the market over/underreaction proposition.

Eckbo, Masulis, and Norli (2000) report that, on average, 11.1% of the firms in the factor-mimicking portfolios also make SEOs during the subsequent five years. They purge their factors by eliminating a firm from the factor-mimicking portfolios if the firm issued equity (primary offerings) over the previous five years. Lyandres, Sun, and Zhang (2005) also report results based on purged factors. The main conclusion of both studies is zero abnormal returns when using issuer-purged factor regressions.

6. Conclusions and issues for future research

The economics of security offerings has generated considerable empirical research interest over the past two decades. This survey alone identifies more than 280 studies largely restricted to public seasoned security offerings for cash—and we have surely missed some. In addition, there are a large number of related studies discussed in other surveys in this Handbook, including those on IPO underpricing (Ljungqvist, 2007), security swaps associated with corporate takeovers and restructurings (Betton, Eckbo, and Thorburn, 2007; Eckbo and Thorburn, 2007; Hotchkiss et al., 2007), stock compensation to employees (Aggarwal, 2007), private equity (Gompers, 2007), and credit markets (Drucker and Puri, 1989). In all of these settings, the issuer faces both direct and indirect flotation costs that depend on (1) constraints imposed by security regulations, (2)

the range of available flotation method choices, (3) underwriter competition, (4) information asymmetries between issuer and outside investors, and (5) the efficiency of market pricing. This survey discusses each of these five determinants of flotation costs. Several findings emerge, as well as new questions for future research, some of which are discussed below.

Public security offerings for cash are vulnerable to conflicts of interests. These conflicts have created rationales for substantial regulatory protections of investors and requirements on issuers. The legal requirements are designed to ensure that investors receive adequate information disclosure and they limit the "aggressive" marketing by the issuer. In general, legal systems, tax codes and securities regulations and the treatment of investors of a country are likely to have a significant bearing on the level of security offering activity. In the U.S., major regulatory milestones include the Securities Act of 1933 (establishing issue registration and disclosure rules), the Securities Exchange Act of 1934 (requiring periodic public disclosures via annual 10-K, quarterly 10-Q and occasional 8-K statements), the move to adopt generally accepted accounting standards (GAAP), the introduction in 1982 of "shelf registration" rules for relatively low-risk issuers (SEC Rule 415), registration exemptions aimed at reducing regulatory costs and improving the liquidity of privately placed securities by privately held companies and foreign issuers in 1990 (SEC Rule 144A), the establishment of Self Regulatory Authorities (NYSE, NASD) who impose various listing requirements and regulate many activities of broker-dealers and underwriters, and most recently, the creation as of December 2005 of a new category of issuers called "well-known seasoned issuers". These issuers are given automatic shelf registration status and may have oral or written communications with investors before during and after the offering process.

Looking internationally, there has been an increase in disclosure regulation and increased regulation and enforcement of insider trading activity. Moreover, parallel to U.S. securities regulation developments, similar national regulatory authorities are developing around the globe. In 1998, the International Organization of Securities Commissions (IOSC)—a global organization of national security regulators-adopted a comprehensive set of objectives and principles of securities regulation, which today are recognized by the world financial community as international benchmarks for all markets.

Additional research is needed to increase our understanding of the impacts of national securities laws, corporation laws and bankruptcy laws for firm issuance decisions. More cross country analyses could help in this regard. Moreover, we need a better understanding of the effects of political processes on these critical legal statutes. How does political corruption influence issuance costs and security issuance choice? How strong are the financial incentives of the dominant economic powers in a nation to limit potential competition through restrictions on capital market development and what are the most effective mechanisms for overcoming these effects? How important are particular reforms that reduce the barriers to global capital market activity in promoting national financial and economic development?

Regulatory changes provide interesting laboratories for examining empirically the exogenous determinants of issue costs and issuers' choice of security and flotation meth-

ods. On the one hand, the large increase in the aggregate amount of securities offerings over the past 25 years suggest that the stricter disclosure requirements has had a positive effect on firms' incentives to issue securities. However, additional analysis is needed of the specific effects of the new SEC securities regulations on disclosure requirements, shelf registrations and the creation of "well-known seasoned issuers". Do these regulatory changes have a significant effect on flotation costs, the choice of offering methods, the types of securities issued and timing of offerings? Is there evidence that these new rules lower asymmetric information between issuers and investors? How do the new regulations affect the frequency of foreign security issues in the U.S.?

One of the early regulatory experiments that financial economists studied was SEC Rule 415, known as shelf registration. This regulatory change was designed to lower issue costs. As we show in Table 3, only fifteen percent of the SEOs by U.S. firms employ the shelf registration procedure (half of the debt issuers use shelf registration). SEO shelf offerings tend to be relatively large-but infrequent. The apparent reluctance to take advantage of the relatively low-cost shelf registration procedure is puzzling. It is possible that shelf registration exacerbates adverse selection in issue markets, and is therefore selected only by relatively transparent firms (where the information asymmetry is relatively low). Such self-selection of the issue method suggests that the market reaction to shelf issues should be no lower than the market reaction to traditional non-shelf (underwritten) issues, which is broadly consistent with the reported empirical evidence.

As a general matter, the field would benefit from further analysis of the endogeneity of the choice of security offered and flotation method. The existing literature generally adjusts for endogeneity using predictive models of the issuer's choice of securities and issue method with very modest explanatory power. In estimating such a model, we need to know to what extent are the types of securities issued, their flotation costs and issuance method affected by issuer investment and financing characteristics, asset structure, capital structure, industry identity and the issuer's corporate governance? We also need better predictive models of an issuer's choice of security to sell. Hence, there is a need for further theoretical and empirical research to improve the explanatory power of these predictive models. After which, we need to re-evaluate the robustness of the major results in the prior literature.

Another important regulatory experiment is the 2002 enactment of Sarbanes–Oxley. This landmark legislation has imposed substantial corporate governance constraints and obligations on publicly held companies, preempting state corporation law in a number of areas. A number of the interesting questions are raised by the law. What are the effects of Sarbanes–Oxley on domestic and foreign issuers of securities in the U.S.? How does this law affect auditor independence and the reliability of auditor certification of the financial statements or the market reaction to news of issuer–auditor disagreements? How does this law change the likelihood of earnings restatements and shareholder reactions to new financial statements? What is the importance of board of directors' powers relative to shareholder powers and the potential benefits of giving shareholders stronger voting rights and control rights in determining the security issuance decision and the costs of security issuance? We need a clearer understanding of how security contract

characteristics can be altered to better align the interests of different classes of securities and to protect against the extraction of private benefits of controls by managers.

Turning to specific determinants of issue costs, we survey a large body of empirical research on the underwriting function in general and on the determinants of underwriter compensation more specifically. The field continues to only partially understand the effects of asymmetric information between issuers/underwriters and outside investors and use of various institutional mechanisms to limit this effect such as the right to renege on primary offering buy orders, restrictions on short selling by underwriters, restrictions on short selling by investors and lock-up provisions on insiders, the use of overallotment options, the choice of auditor, price stabilization, shareholder suits against issuers and underwriters, the effects of new SEC disclosure regulations and how important are certain accounting rules.

How important is security liquidity to flotation costs and how can this liquidity be improved cheaply? How important is it to have short selling opportunities or an active option market for the stock? Do these opportunities increase security price volatility and does this increase the costs of liquidity? To what extent do various information producers such as financial analysts, bond rating agencies, auditors, market makers/exchanges that report bids, asks and transaction prices, and investment bank fairness opinions reduce heterogeneous expectations among investors and increase securities trading and their liquidity? There is also a need to further investigate of the degree of interdependence of underpricing, underwriting spreads, out of pocket expenses and the probability of offer withdrawal and why these relationships appear to vary qualitatively by type of security, which is somewhat puzzling.

Another important question is how underwriter competition is impacted by the entry of commercial banks and foreign financial institutions. What are the fundamental services offered by underwriters and how do these services enhance share liquidity in the primary and secondary markets and what are the impacts on security prices? Further analysis is needed on the impacts of investment banking competition, and the interrelationship of underwriting services for debt and equity offerings with M&A advisory services.

How does learning take place in security contract innovation in the private equity market (venture capital term sheets), private placement market and public security markets. For example, how have bond covenants, and microfinancing mechanisms evolved? To what extent are innovations triggered by widely covered scandals, which broadcast problems in existing contracting technology? Are there spillover effects in contracting technology across security markets and across countries? What determines the speed of technology transfers?

Empirical research in this area is constrained by the availability and reliability of databases within the reach of university budgets. One important area that is under-studied because of a lack of data is corporate bond issue activity. We know very little about the flotation process for corporate bonds. What are its unique institutional features of the corporate bond offering process? However, new databases will soon be available in this area allowing researchers to investigate many interesting questions. What are

the determinants of flotation costs and how is it impacted by bond seniority, collateral, affiliated company guarantees, maturity, sinking funds, call protection, and the instrument's liquidity and interest rate volatility and changes in the issuer's capital structure and financial condition?

We reconfirm the empirical fact—first established by Mikkelson and Partch (1986)—that public seasoned equity issues for cash (that is, SEOs) are rare corporate financing events. Eckbo and Norli (2006) report that for a sample of 6,000+ IPOs from the period 1980–2005, about half of the IPO firms undertake *no* public follow-on offering over the remainder of the sample period (regardless of the security type), and only one-quarter follow on with a SEO. The low issuance activity is relevant for the more general question of firms' capital structure choice, and for a pecking order theory in particular.

Fama and French (2005) show that including employee compensation and equity swaps in mergers and acquisitions in a broader definition of seasoned equity issues leads to the conclusion that the typical firm issues equity every year. They view this high frequency of equity issues as evidence against the Myers (1984) pecking order. However, it is questionable whether the type of information asymmetry assumed in Myers and Majluf (1984)—which motivates Myers (1984)'s pecking order—is relevant for employee stock repurchases and option holdings. Also, equity swaps to finance mergers and acquisitions introduce two-sided information asymmetry, which can under some reasonable conditions place equity at the *top* of a (modified) pecking order. Clearly, additional research on the theoretical placement of equity swaps in a pecking order, as well as on the trade-off between debt and equity issues is required, before we can have confidence in the ability (or lack thereof) of the pecking order to explain the nature of and motivations for firms' issuing behavior.

There is a large empirical literature providing estimates of the market reaction to security issue announcements, both in the U.S. and internationally. This market reaction is interesting in part because it shows a significant equity price dilution affect, even for issuers who hire reputable underwriters to market their shares. This evidence is broadly consistent with primary issue markets being characterized by adverse selection. Research extending the basic intuition provided by Myers and Majluf (1984) adverse selection model has shown that the amount of price dilution also depends on the degree to which the issuer's own shareholders participate in the issue (in a rights offer), the existence of strong investment opportunities as well as on the sequential nature of the issuer's flotation method choice. It is also important to recognize that the Myers and Majluf model assumes strong management alignment of interest with old shareholders, which may or may not be the case. The various equilibria from these adverse selection models predict a negative, zero or positive market reaction to SEOs, which points to the importance of using carefully "controlled experiments" when testing more generalized theories of issuing behavior, e.g., such as the pecking order.

The literature on announcement effects represents such "controlled experiments" and has produced several interesting findings. The typical firm commitment underwritten offering in the U.S. is met with a statistically significant negative market reaction of close to -2%, which represents a dilution in dollar terms equal to approximately 15%

of the proceeds of the typical SEO. If one views this dilution effect as an issue cost (which is arguably the case), then it swamps even relatively high firm commitment underwriting costs. Differential average market reactions across issues and issuer types are also important. The market reaction is less negative for regulated utilities, for smaller issues, for less risky securities such as debt, for issue methods that involve preemptive rights, for shelf offerings, and for private placements (which tend to elicit a positive market reaction).

These empirical regularities are broadly consistent with the predictions of separating equilibria reflecting adverse selection in issue markets. For SEOs internationally, where the equity flotation method typically involves preemptive rights, the empirical evidence is also largely consistent with theories of adverse selection. Samples of foreign issues are interesting both because they allow a study of rights (which have largely disappeared in the U.S.), and because they provide greater variation in institutional and ownership characteristics of issuing firms. We expect future studies of foreign security issues to contribute substantially towards our understanding of the economics of the issuance process.

The survey ends with a review of the empirical literature on post-issue stock returns—so-called "long-run" performance studies—and we complement this literature with our own performance estimates. The key theoretical question in this literature is whether firms are able to exploit their private information at the expense of outside investors. In the vernacular of Loughran and Ritter (1995), are firms able to time their equity issues to temporary "windows of opportunity", when it is possible to sell overpriced equity to new investors? Do investors who purchase and hold the new shares through the subsequent price correction period realize a negative risk-adjusted (abnormal) holding-period stock return?

The literature is in substantial agreement that the average realized two-to-five-year holding period (raw) returns following equity issues is significantly lower than the average return realized by non-issuing firms matched to have similar size and book-to-market value. We show that this result also holds for security issues beyond SEOs and IPOs, such as private equity issues, and issues of straight and convertible debt. The extant evidence that issuers underperform non-issuing matched firms appears convincing. The controversy starts when one interprets this underperformance as a measure of abnormal returns to issuers. In the jargon of asset pricing theory, the difference between the return to issuers and non-issuing matched firms is a measure of abnormal (or unexpected) returns, only if the two types of firms have identical exposures to priced risk factors. A number of studies have shown that the assumption of equal risk exposures is unlikely to hold.

Recent research also indicates that security issuers often exercise large real investment options around the same time. Theory predicts that converting investment options to assets in place should cause risk profiles—and therefore issuers' expected returns—to fall. This has the effect of making their initial "matching firms" too risky in the post-issue period. This mismatch causes the benchmark expected returns of the "matching" firms to be too high and thus, the long term performance of issuers is biased downward.

This discussion points to the futility of using non-issuing firms matched on size and book-to-market ratio to benchmark risk. This may not be surprising when one considers that issuers self-select both the timing and type of security to issue. The similarity in firm size and book-to-market ratio notwithstanding, firms that decide to issue and invest are likely to be in a different economic state and at different points in their life cycle than firms that either do not invest or use internal equity to finance investment.

The empirical asset pricing approach allows a more consistent and plausible way of identifying and correcting for the true risk exposures of issuers. While we lack a unified asset pricing theory with a priori identifiable factors, there is ample evidence that large portfolios that in addition to market risk captures firm characteristics such as equity size, book-to-market ratio, return momentum and (perhaps) liquidity, explain a significant portion of the cross-section of expected stock return. Using these portfolios as risk factors, the difference between the average returns to issuers and non-issuing matched firms become negligible. Thus, the joint hypothesis of the risk model and market efficiency in pricing new securities issues cannot be rejected at conventional levels of confidence. We provide a broad update of this result across several types of new issues, such as public and private placements of equity and different types of debt issues. Overall, this part of the survey leads us to conclude that the long-run performance literature to date fails to provide systematic evidence in favor of behavioral models of either issuer or market behavior.

Research on security offerings continues to advance rapidly. It is currently being strongly influenced by advances in asset pricing theories, market microstructure, optimal capital structure and financing theories, theories of corporate governance, agency and optimal contracting. The development of new databases on security offerings outside the U.S. and of various fixed income and hybrid securities in the U.S. and elsewhere is also stimulating new empirical research on security offerings. At the same time, researchers are incorporating more institutional features regarding laws, regulations, taxes and political considerations into their analyses of the security offering process. The end result is a much richer understanding of the complexities of the security offering process and how much we still need to learn.

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