The valuation of sub-underwriting agreements for UK rights issues

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Most equity issues in the United Kingdom are underwritten—that is, a group of financial institutions guarantees to buy any unsold shares at a pre-arranged price. The pricing of this guarantee affects the cost and efficiency of industry's capital raising. Earlier studies in a number of countries, including the United Kingdom, have suggested that underwriting fees are much higher than can be accounted for by fully competitive pricing. This article explores some modifications to those previous calculations and concludes that, while a rather larger part of the fee may be accounted for, there remains a margin still to be explained.

Most equity rights issues in the United Kingdom are underwritten, with a lead underwriter, supported by up to 400 sub-underwriters, undertaking to buy any shares that remain unsold. For some years there has been a vigorous debate over the fees (currently a flat 2% of the offer) charged for this service. Some have argued that 2% is excessive, pointing to the fixed-fee structure as evidence of inefficiency. Others have argued that the fees are a fair reward for the risks borne and that the fixed fee is simply a convenience that allows underwriting to be arranged quickly. They note that, although the fee is a fixed percentage, the discount at which the issue is offered is open to negotiation and this can be used to adjust for differences in risk between issues. The debate matters since, if sub-underwriters overcharge, raising new equity—and so capital itself—may be needlessly expensive.

The debate led the Office of Fair Trading to commission Professor Paul Marsh of the London Business School to estimate the economic cost of sub-underwriting and compare it with the fee charged. He found that the fee did indeed seem to be higher than the cost and so judged the fees to be excessive.[1] But, in order to estimate these costs, Marsh made a number of assumptions which some have argued were inappropriate and might have caused him to underestimate the true cost of sub-underwriting. This article describes some extensions to Marsh's research undertaken in the Bank[2] which attempt to allow for some of these factors.

Rights issues in the United Kingdom

In a traditional UK rights issue, the issuer will normally use an issuing house—usually a merchant bank—and a broker. As well as preparing offer documents and advising on the timing and the price of the offer, the issuing house will usually act as lead underwriter. The broker acts as an agent for the issuing house by securing sub-underwriting commitments from other institutions such as insurance companies, pension funds and banks.

Timing does vary, but the issuing house, broker and company will normally agree the issue price at a meeting held at close of business on the day before 'impact day'. If the issue is being underwritten—as about 95% of all rights issues are—the issuing house will also sign the lead underwriting agreement in which, subject to an overnight reserve, it guarantees to buy any part of the issue that is not taken up. The next day the issue is publicly announced, the rights (typically) are allocated to shareholders and the issuing house instructs the broker to arrange sub-underwriting for some or, more usually, all of the issue. The broker sends out letters of invitation at 9.00 am on impact day, giving the sub-underwriters a few hours to respond, usually by mid-day. The sub-underwriters are typically given a 'take it or leave it' offer, based on the terms arranged by the issuing house. The number of sub-underwriters is usually quite large: 100–150 for small offers and 300–400 for large ones. Shareholders are usually given three to six weeks to take up their rights, with the underwriters obliged to take up any shares remaining unsold at the end of that period (the 'stick').

By custom, underwriting fees are usually a flat 2% of the offer, though lower fees have been negotiated for privatisations. Of this 2%, 0.5% goes to the issuing house, 0.25% to the broker and 1.25% to the sub-underwriters. If the period of the issue exceeds 30 days, the sub-underwriters' fees are increased by 0.125% per week.

Valuing sub-underwriting—Marsh's study

Since sub-underwriters do not supply advice or other services to the firm, the value of the service they provide—insurance—is relatively easy to value. Marsh used two measures of the cost of this insurance for a sample of

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(1) *OFT Research Paper* No 6, 1994.
(2) Described in detail in Breedon, F J and Twinn, C I (1995).

691 issues carried out between 1986 and 1993. The first measure was simply the average losses incurred by sub-underwriters when they were required to buy unsold shares. The second was the notional value of the implicit option sold to the firm by the sub-underwriters: the underwriting commitment is analogous to the sub-underwriters selling the company a put option, since it gives the company the right (but not the obligation) to sell the issue to the underwriters. This option can, in principle, be valued using a standard option-pricing formula.

As Table A shows, Marsh found, using both methods, that the fee charged by sub-underwriters was substantially higher (at an average of 1.43% for his sample) than the economic cost of sub-underwriting. But there are a number of problems with both approaches.

Table A
Marsh's results

Per cent

	Economic cost (a)	Excess return (b) (fee minus cost)
Average loss method	0.69	0.74
Average loss method (excluding 1987 crash)	0.18	1.25
Option value method	0.20	1.23

(a) Costs weighted by value of issue and expressed as a percentage of it.
(b) Average fee in this sample was 1.43%

The average loss method, despite its intuitive appeal, has two major problems. First, it makes no allowance for the cost of capital employed by the sub-underwriter: underwriting, irrespective of whether the issue is fully sold or not, involves the underwriter in risking part of their capital and they might reasonably expect compensation for this. Second, as Table A shows, the results of this method are highly dependent on the sample period chosen—excluding the 1987 crash from the sample reduces the estimated cost by 0.51 percentage points. This is a problem since there need be no correspondence between the expected costs on which the underwriters base their fees and the realised costs actually borne during a limited sample period.

Marsh's second method—option pricing—in principle solves both these problems, because using option pricing generates the expected rather than actual value and should allow for the cost of capital. As a result, Marsh's study focuses on the results calculated using this method rather than the average realised loss. But pricing sub-underwriting using option-pricing models in turn requires certain assumptions to be made. Many have argued that some of these assumptions are unrealistic, in the case of sub-underwriting, so using the option-pricing method gives an underestimate of the true cost of sub-underwriting.[1] Our research has therefore attempted to adjust Marsh's option-pricing approach to take account of these factors.

Valuing sub-underwriting—evidence from the traded options market

Our work attempts to allow for three factors which may have caused Marsh to underestimate the true cost of sub-underwriting using his option-pricing approach. In particular, by using data from the traded equity options market, we have attempted to identify the price of options actually trading in the market (which also reflect the expected cost of hedging) instead of a theoretical price derived from an option-pricing formula. The drawback of the approach is that it limits the number of rights issues that can be analysed to those companies for which a traded option also exists. This reduces the usable sample dramatically, from 671 to 31. In addition, the companies on which options are traded also tend to be larger, with more liquid stocks and bigger rights issues.[2]

The three factors considered in our work were:

● *Measures of volatility*. When pricing an option, an estimate of the underlying asset's expected price volatility during the life of the option is required. Marsh used a measure of historic volatility, based on share price movements over the 60 months prior to the rights issue. But there are good reasons why this volatility might change during the offer period: for instance, uncertainty—either about the value of the proposed use of funds or about the issue's likely success—may increase volatility during the offer period. If, however, the firm's management and advisors reveal all impending 'news' when the issue is announced, the share price's volatility might actually be lower during the offer period than normally. To take account of these possibilities our work used the actual volatility implied by the price of the relevant option traded on LIFFE.

● *Transactions costs*. Despite being based on the idea of riskless, fully hedged positions, the standard option-pricing formulae used by Marsh (Black-Scholes, 1973) does not include any adjustment for the transactions costs of creating and adjusting the hedging position. Many studies[3] have shown that, once these costs are allowed for, the 'fair' price of an option is significantly higher than conventional formulae imply. To allow for these costs, our research valued the option at the ask price that would prevail in the traded options market.

● *Measuring the current share price*. Marsh used the share price on the day before the rights issue. Although he allowed for the possible dilution effect of a rights issue on the share price, this approach does not allow for any other effects the rights issue might

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(1) For a detailed discussion, see Breedon, F J and Twinn, C I (1995).
(2) The average value of the issues in the LIFFE sample was £332 million (compared with an average size of only £20 million for the issues in Marsh's study)—although Marsh found the largest profit was on these bigger issues and replicating the Marsh approach for our sample yields a value-weighted return of 91%, not dissimilar to the 86% return found by Marsh.
(3) See, for instance, Figlewski, S (1989).

have on the market's valuation of the firm. Since rights issues tend to have an adverse effect on the firm's perceived value, Marsh's approach may overstate the current share price and so may lead to the option being undervalued. To overcome this problem, in pricing the option our research used the share price at the close of business on the 'launch' day. This assumes that any fall in the share price caused by the rights issue occurs before noon (the time by which sub-underwriters must undertake to buy the issue). As Chart 1 shows, for one of the issues in our study,[1] this does indeed appear to be the case.

Chart 1
Intra-day share price on announcement day

Number of shares in thousands

Number of shares traded (left-hand scale)

Share price (right-hand scale)

Share price

Time

Share price is the price of the last trade in each 15 minute period

Chart 2
Open interest in the traded options market relative to the size of the share issue

Proportion of rights issue

September   October
1994

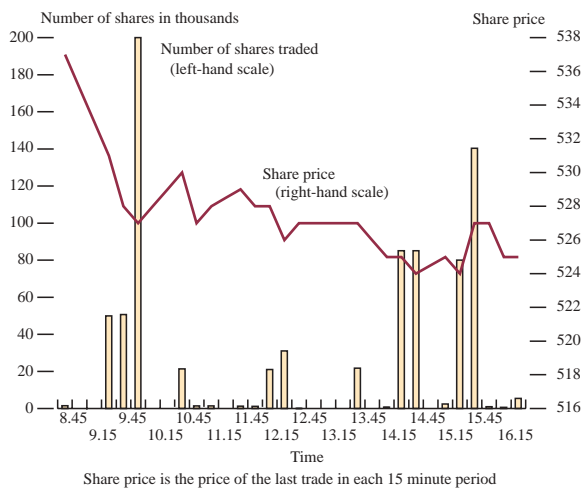Note: Open interest measured as delta equivalent.

Table B shows the effect of adjusting for these three factors. It shows that, although they substantially reduce the unexplained margin, it is not eliminated altogether.
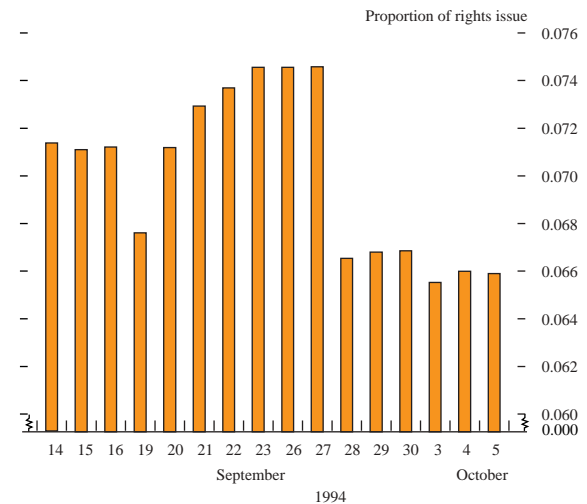
Table B
Costs of sub-underwriting

	Economic cost	Excess return (a) (fee minus cost)
Marsh's method	0.11	1.14
Adjusting for:		
(i) share price on announcement day	0.32	0.93
(ii) (i) + option volatility	0.38	0.87
(iii) (ii) + bid-ask spread	0.76	0.49

(a) Weighted by value, the average fee in this sample is 1.25%.

Our method is, of course, also based on assumptions that are open to criticism. The most important is that spreads in the traded option market are comparable to the possible transactions costs incurred by sub-underwriters. As Chart 2 shows,[2] turnover in the traded options market is small in comparison with a rights issue, and underwriting could not in practice be replaced by—or hedged with—the purchase of a traded put option. But the fact that the two markets are not comparable in size is not necessarily important, as long

as transactions costs per share are fixed. The evidence on how transactions costs vary with deal size does not give clear results, though it does suggest that the costs increase slightly as deal size increases. But there are two other effects which mean that our research is unlikely to have underestimated trading costs. First, our measure is based on quotes rather than actual dealing costs and there is evidence that quoted spreads are substantially wider than dealing spreads in most markets.[3] Second, most of the evidence for transactions costs increasing with deal size suggests that dealing costs only increase if the information content of a large trade is high. Hedging associated with a pre-announced rights issue is unlikely to have any information content and so it is unlikely that deal costs will increase in trade size in this case. Taking these two effects together suggests that the figures for transactions costs used in our study may, if anything, overestimate the true costs involved.

The rights issue puzzle

It is difficult to reconcile these results with the known features of the market.

First, it is difficult to argue that there is a lack of competition in the market for advice on rights issues: companies have a choice over both the method of issuance and the underwriter, if they choose to use one. One possible explanation of why the present level of charges might nevertheless persist is that the alternative methods— deep-discounted[4] and book-built[5] offers—are close but not perfect substitutes. They may involve some costs that makes the firm's management willing to pay a premium to have the issue underwritten. For instance, there may be a possible capital gains tax liability for investors in deeply

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(1) Commercial Union, 1994.
(2) Commercial Union, 1994, *op cit.*
(3) For instance, Board and Sutcliffe (1995) estimate the quoted spread in the traded option market to be over 10% greater than the actual dealing spreads.
(4) Where the shares are offered to existing shareholders but at a big discount to the current share price.
(5) In this case the shares are offered to all comers with the lead broker creating a book of the demand from potential investors and pricing the issue at the market clearing price in response to these bids.

discounted offers; other firms may be willing to pay a premium for the certainty of underwriting (for example, because they need to secure the money to complete a takeover) or to avoid the financial and reputational costs of an issue which is not fully taken up.

The second reason why the apparent profitability of sub-underwriting is difficult to understand is shown in Table C: similar results have been found in every country studied, despite the fact that the underwriting process itself differs between countries.

Table C
International estimates of excess returns to sub-underwriting

Per cent

Author	Country	Excess return
Marsh (1980)	United States	1.08
McCulloch and Emanuel (1993)	New Zealand	0.67
Kunimura and Iihara (1985)	Japan	1.89

In fact the US case is even more puzzling than the British one. In the United States there are three main types of equity issues; *uninsured* issues, with no underwriting; *standby* issues, where underwriters agree to purchase all unsubscribed shares; and *firm commitment underwritten* issues, where the entire issue is sold directly to the underwriters. A number of studies have established that the last of these is the most expensive for the company.[1] Even so, over the last 40 years, US firms have increasingly moved to the firm commitment method. In the period 1933–55,

approximately half of all issues used firm commitment, while in the period 1963–1981 firm commitments accounted for more than 95% of all US issues. In fact by 1981, other issue methods had almost completely disappeared.

The US evidence suggests that the choice of equity issuance technique by companies is not based solely on direct cost considerations and that other elements must play a part in these decisions. So it seems reasonable that these unidentified elements may be important in the UK context too. One possibility is that the method of issue is taken by potential investors as a signal of the issue's value. If underwriting is interpreted as a signal from the underwriting institutions that the issue is worthwhile, this might reduce the premium required by potential investors to compensate them for, for instance, the possibility of trading against more informed investors (who know better which offers to invest in and which to avoid).

Conclusion

Although our work points in the same direction as the Marsh study, it finds a smaller discrepancy between fees and measured costs. But it is not possible to conclude from this that there is inadequate competition in this market, since firms do have a choice both of issuance technique and of underwriter. The US evidence of firms moving from a seemingly cheap issuance method to a more expensive one indicates that the factors determining firms' choices are not yet fully understood.

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(1) See, for example, Smith, C W (1977).

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