

New Issues on the U.K. Unlisted Securities Market: The Ability of Entrepreneurs to Signal Firm Value

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ABSTRACT. The present paper investigates whether small firm entrepreneurs are able to signal the value of their firms to potential investors when seeking a listing on the U.K. Unlisted Securities Market (USM). The signals considered are the percentage of equity retained by the original entrepreneurs, the net proceeds raised by an issue, the choice of advising agents to an issue, the disclosure of an earnings forecast and the level of underpricing of the new issue. In addition, the possible interactions between the individual signals are considered and included in the analysis. The results of the empirical analysis suggest that firm value is positively and significantly related to the percentage of retained equity and the net proceeds raised: thus suggesting, therefore, that stock markets will invest at higher values, *ceteris paribus*, if entrepreneurs indicate confidence in their enterprises via levels of equity retention and the funds they intend to invest in future projects.

Introduction

The ability of firms to signal their value to potential investors when floating their common stock on an equity market for the first time has received a lot of theoretical attention (see, for example, Leland and Pyle, 1977; Titman and Trueman, 1986). Whilst the theoretical literature has developed to the point of complex models that consider

the interactive use of a number of variables to signal the value of the firm to potential investors, the empirical research in this area is relatively limited. Furthermore, the empirical literature to date seems to have concentrated on large firms. The purpose of this paper is to determine, after a critical examination of the existing empirical literature, whether small firm entrepreneurs are able to signal the value of their firms when seeking a listing on the Unlisted Securities Market (USM) in the U.K. The signals considered are the percentage of equity retained post flotation by the original entrepreneurs, the net proceeds of the new issue, the choice of advising agents to the issue, the disclosure of an earnings forecast prior to flotation and finally, the level of underpricing of the new issue.

This paper is organised into four sections. Section 1 summarises signalling theory and reviews the existing empirical evidence. Section 2 describes the data, empirical methods and variables to be employed in the analysis. Section 3 contains the empirical results and related discussion. The final section presents conclusions.

Signalling theory and empirical evidence

Signalling theory

A theoretical literature has developed which considers how entrepreneurs might signal the value of their firm to potential investors (Leland and Pyle, 1977; Ross 1977; Bhattacharya, 1979, 1980; Bhattacharya and Ritter, 1983; Verrecchia, 1983; Trueman, 1986a, b; Titman and Trueman, 1986; Heinkel and Schwartz, 1986; Hughes, 1986; Grinblatt and Hwang, 1989; Allen and Faulhaber, 1989; and Welch, 1989). In contrast, the pub-

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lished empirical work has lagged somewhat behind and seems to have concentrated on large firms (for example, see Downes and Heinkel, 1982; Ritter, 1984; and Krinsky and Rotenberg, 1989).

Signalling theory contends that when an entrepreneur brings his/her firm to an equity market for the first time, he/she needs to convey information to potential investors as to the value of the firm. Investors will be able to discern a certain amount of information regarding firm value from publicly disclosed information, such as annual reports, the flotation prospectus and press reports. However, a certain amount of 'inside' information, essential to the assessment of the true value of the firm, concerning potential future cash flows, investment opportunities, managerial skills and the ability to control future agency costs, market potential, etc., will be known only to the entrepreneur and will not be revealed to outsiders by way of publicly available information. Hence an information asymmetry exists as the entrepreneur is in a stronger position to value the firm than outside investors. Given such information asymmetry, an entrepreneur with favourable inside information has incentives to signal this information to outsiders. However, in view of the incentives for entrepreneurs with less favourable information to misrepresent future firm prospects, the entrepreneur is unable to directly convince potential investors of the value of this additional information. This information asymmetry results in a classic 'lemons' problem (Akerlof, 1970), as all firms have incentives to represent themselves as being of high value. Therefore, in order to have information content and be seen as credible in the eyes of external parties, signals of firm value must be difficult and costly for low value firms to mimic. That is, a cost must be associated with the actions taken to signal firm value such that misrepresentation would result in a loss to the entrepreneur. If the entrepreneur takes actions which will be costly to him/her should future cash flows be low (for example, he/she retains a significant proportion of equity), potential investors may infer from these actions that the entrepreneur believes future cash flows to be high on the basis of his/her 'inside information'. The entrepreneur's actions, which amount to 'giving money away', therefore, act as signals to the market as to the true value of the firm.

Signalling theory, therefore, hypothesises that when bringing a firm to the market for the first time, in the presence of information asymmetry, an entrepreneur will attempt to signal the true value of the firm to potential investors via his/her own observable actions. Signals hypothesised to be of interest to entrepreneurs bringing their firms to the USM include the percentage of equity retained post flotation, the net proceeds raised by a new issue, the disclosure of an earnings forecast prior to flotation, the choice of advising agents to the issue and the degree of underpricing of the new issue. With respect to USM firms, data pertaining to all of these signals can be found in their flotation prospectuses. For example, the net proceeds to be raised by an issue are shown in estimated form in the issue prospectus. The previous literatures concerned with the use of these signals are examined in the following paragraphs.

In their 1977 seminal paper, Leland and Pyle presented a model in which information concerning the value of a firm was signalled via,

the willingness of person(s) with inside information to invest in the . . . firm (Leland and Pyle, 1977, p. 371).

The higher the level of equity retained by insiders, the greater the risk faced by the entrepreneur due to his/her personal portfolio being less diversified. *Ceteris paribus*, an entrepreneur would only be willing to face increased risk if there was a balance of higher returns. It follows that the level of equity retained must be contingent on the entrepreneur's expectations as to future performance and firm value. Therefore, the value of the firm is expected, in general, to be positively related to the percentage of equity retained post flotation by the entrepreneur (assuming a given level of investment). The Leland and Pyle hypothesis was extended by Trueman (1986a) who argued that the level of planned expenditures post flotation (proxied in this paper by the net proceeds raised from the sale of new shares) can act jointly with the percentage of retained equity as a signal of firm value. As a result of this trade-off, the relationship between retained equity and firm value may not always be positive; that is, the greater the level of planned expenditures, the less equity needs to be retained to signal a given level of firm value.

The use of earnings forecasts as a device for

signalling firm value to investors was considered by Verrecchia (1983) and Trueman (1986b). In the model proposed by Verrecchia, an entrepreneur taking his/her firm to the market and in possession of good news has an incentive to disclose his private information in the form of a forecast. Rational investors therefore interpret the absence of a forecast as bad news and discount the value of the firm accordingly. It therefore follows that, in the absence of disclosure costs, all but those entrepreneurs with the most negative news will be motivated to release earnings forecasts. However, the introduction of disclosure costs into the model allows entrepreneurs to exercise discretion over the provision of a forecast. Favourable information will only be disclosed if the benefits of disclosure outweigh the associated costs. As a result, investors are unable to unambiguously interpret the absence of an earnings forecast as conveying bad news. Alternatively, Trueman (1986b) proposes a model in which the very act of releasing a forecast itself provides a positive signal to the market concerning managerial ability. The market value of the firm is assumed to be a function of investors' perceptions of the entrepreneur's ability to anticipate future changes in the firm's economic environment and adjust production plans accordingly. The act of releasing a forecast is therefore motivated by the entrepreneur's desire to inform investors of this ability.

In the case of a firm entering the USM, however, an earnings forecast forms part of the flotation prospectus, the contents of which are ratified by the reporting accountant. Therefore, the effect of an earnings forecast as a signal of firm value may be dependent on the quality of the accountant ratifying the prospectus contents. An earnings forecast may only be interpreted as a credible signal of firm value if it is ratified by a high quality accountant. In other words an earnings forecast signal may depend in part on the quality of the agents chosen to advise on the flotation process.

However, the quality of the advising agents may itself be used to signal firm value (Titman and Trueman, 1986). Titman and Trueman contend that entrepreneurs with more favourable inside information will employ higher quality auditors than entrepreneurs with less favourable inside information. The basis for this hypothesis is that

high quality auditors provide more accurate information to investors, allowing them to make a more accurate assessment of the firm's value. Hence entrepreneurs with favourable information have incentives to employ a more expensive high quality auditor as the information supplied to potential investors by that auditor is likely to be favourable. Consequently, investors will be able to infer the nature of the inside information from the quality of the auditor chosen. It follows that firm value will be positively related to the quality of the advising auditor chosen. Whilst Titman and Trueman model their hypotheses in terms of the quality of auditors employed, they note that,

The model, however, is also applicable to the choice of investment banker quality or, more generally, to the entrepreneur's choice of the quality of any outsider who can provide information about the firm (Titman and Trueman, 1986, p. 160).

Consistent with the Titman and Trueman hypothesis, concerning the quality of information provided by different quality auditors, are the arguments put forward by Beatty (1989), who suggests that high quality auditors have greater reputation capital at stake than low quality auditors and hence have greater incentives to investigate misrepresentations by offering firms. Beatty argues that,

Since auditing firms that have invested more in reputation capital have greater incentives to reduce application errors, the information disclosed in the accounting reports audited by these firms will be more precise, *ceteris paribus* (Beatty, 1989, p. 696).

The final signal to be considered by this paper is the level of underpricing of the new issue. Grinblatt and Hwang (1989), Allen and Faulhaber (1989) and Welch (1989) develop theoretical models in which those entrepreneurs with favourable private information signal such information to the market by issuing shares at less than their intrinsic value. The basic idea behind the models proposed is that, by underpricing, entrepreneurs are leaving money on the table and are therefore bearing an opportunity cost in terms of lost equity finance. Potential investors are aware that this loss can only be recovered by those firms who expect to generate high future cash flows. Hence underpricing acts as a signal of future firm value.

Grinblatt and Hwang (1989) provide a generalisation of the Leland and Pyle model, in which the true value of the firm is signalled to investors via the percentage of equity retained and the degree of underpricing, the degree of underpricing being indirectly observed when the offering price of the issue is announced. The degree of underpricing is demonstrated to be positively related to firm value. In the model proposed by Welch, high quality firms underprice at the initial public offering in order to obtain a higher price of future seasoned offerings. Low quality firms are assumed to be required to bear a cost in order to imitate high quality firms, but with some probability that this imitation will be revealed between offerings. Underpricing therefore serves as a signal of quality to the market because underpricing adds sufficient costs to the signalling process so as to prohibit low quality firms from imitating high quality firms.

However, there is a growing body of literature that considers the relationship between adviser quality, uncertainty and the level of underpricing. Studies by Baron (1982), Rock (1982, 1986) and Beatty and Ritter (1986) suggest that the greater the *ex ante* uncertainty faced by a firm (that is, the uncertainty pre-flotation regarding the value of the traded shares), the greater the expected underpricing of the new issue. Following on from these studies, Beatty (1989) argues that, by employing a high reputation auditor, *ex ante* uncertainty is reduced, thereby reducing the degree of underpricing. These hypotheses, however, conflict somewhat with hypotheses that utilise adviser quality and underpricing as signals of firm value. Titman and Trueman (1986) demonstrate that adviser quality acts as a positive signal of firm value, whilst models by Grinblatt and Hwang (1989), Allen and Faulhaber (1989) and Welch (1989) hypothesise firm value to be positively related to the level of underpricing. However, given the inverse relationship between adviser quality and underpricing as proposed by Beatty (1989), it may be the case that these signals are complementary; that is, the use of a high quality adviser reduces the level of underpricing needed to signal a given level of firm value.

Other signals considered by the literature (but not by this paper) are the level of dividends (Bhattacharya (1979, 1980)) the level of debt

(Ross (1977)), the choice of flotation vehicle (Heinkel and Schwartz (1986)) and the direct disclosure of firm value (Bhattacharya and Ritter (1983) and Hughes (1986)).

b) *Existing empirical evidence*

The empirical research in this area is relatively limited and has concentrated on using samples of large firms. Downes and Heinkel (1984) empirically tested the hypothesis that firm value should be positively related to the percentage of equity retained and to the level of dividends. Employing OLS and WLS regression analysis on a sample of 297 unseasoned new equity issues in the U.S. for the period 1965-69, they found the price/earnings ratio of firms to be positively and significantly related to the percentage of equity retained in the firm by the entrepreneur. However, contrary to expectations, a significantly negative relationship was found to exist between the level of dividends and firm value, although it was suggested that this finding was the result of mis-specification of the regression model. Whilst not explicitly examining the relationship between adviser quality and firm value, their regression analysis utilised a dummy variable representing underwriter quality. This variable was significantly and positively related to firm value.

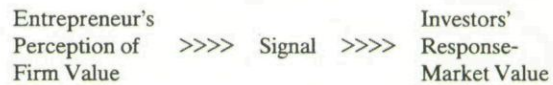
Ritter (1984), however, put forward alternative hypotheses for the Downes and Heinkel's finding of a positive relationship between retained equity and firm value. He suggested that the relationship may be due to wealth effects and/or agency effects, rather than signalling arguments. We argue below that both of Ritter's alternative scenarios are flawed in the context of new issues. Under the wealth effect argument, entrepreneurs who want to raise a given amount of money need to sell a smaller proportion of their stock the higher the market value of the firm. However, *a priori*, there is no economic rationale for the argument that different entrepreneurs seek to raise a constant amount of money across firms. Accordingly, this argument is not given further consideration in this paper. Under Ritter's agency hypothesis, post flotation holdings of less than 100% by the original entrepreneurs will induce managers to reduce their work effort and engage in shirking. The lower the percentage of equity retained, the

lower the firm value due to the possibility of increased managerial shirking. Therefore, in contrast to signalling theory which treats true firm value as exogenous and retained equity as endogenous, agency arguments would suggest that firm value is a function of the percentage of equity retained. Thus, whilst the direction of causation differs for the two arguments, the sign of the hypothesised relationship is the same. Ritter therefore argued that, if the positive relationship between retained equity and firm value is due to agency arguments, an OLS regression with retained equity as the dependent variable and firm value as an explanatory variable will be subject to simultaneous equations bias. An OLS regression is subject to simultaneous equations bias when one of the explanatory variables is causally affected by the dependent variable. As a consequence, the estimated variable will be inconsistent, and suffer from positive bias. It was suggested that a 2SLS regression should have a coefficient on firm value closer to zero than the comparable OLS regression. Using a combination of OLS, WLS and 2SLS regression analysis on a sample of 559 U.S. firms, Ritter concluded that the positive relationship between retained equity and firm value was best explained by the agency hypothesis.

Ritter's attempted separation of signalling and agency is, however, flawed on a number of counts. First, given that firm value is measured at or close to the date of flotation, it is unclear how actual agency effects — a reduction of value because of management shirking — could so quickly affect the performance of a firm. Changes in managerial practices and efforts to control them take time to enter a firm's operations. Second, if it is argued that future agency effects are being impounded into firm value at the time of flotation, then signalling and agency effects are one and the same thing at the time of flotation: for part of the signalling argument is that entrepreneurs are trying to signal their ability to control the firm in the future, i.e., control agency costs.

Finally, even if the two preceding arguments are ignored, the use of two stage least squares (2SLS) would not enable an empirical separation of signalling and agency arguments to be made. The basis of the use of 2SLS is that a signalling perspective implies that equity retention is a function of true firm value, whereas agency arguments

reverse the causality such that firm value is seen to be a function of equity retention. Whilst, this is correct in theory, it has little bearing on empirical analysis because of the 'hidden' nature of the entrepreneur's perception of true firm value. Under signalling entrepreneurs have information concerning the future values of their firms. Given this information the entrepreneurs retain a given level of equity to signal their beliefs to potential investors. The signals are thus used to move market values (a function of investors responding to signals) closer to the entrepreneur's perception of the inherent future value of the firm. There are, thus, two steps to the signalling argument:



The first step, from perceived value of signal, forms the basis of Ritter's use of 2SLS but it is empirically unobservable. What is in fact measured is the second step, from signal to market value, and this has the same direction of causality as the agency arguments. Thus, it does not seem to make sense to try and separate signalling and agency effects in the context of new issues. Furthermore, even if separation were deemed to be worthwhile, 2SLS would not seem to be an appropriate methodology for tackling the issue.

Ritter's approach has been adopted by Krinsky and Rotenberg (1989) in their study of new issues on the Canadian market. Using a sample of 115 initial public offerings for the period 1971–1983, they found the percentage of equity retained in a firm to be insignificantly related to initial firm value across a number of regression equation specifications. In addition, no support was found for Ritter's agency hypothesis. However, examining a number of other possible signals of firm value, support was generated for underwriter quality signal and for planned expenditures post-flotation. However, given the arguments presented above, these results have to be viewed with a degree of caution.

Data, variables and empirical methods

a) Data

The data to be used in this study consists of those

firms achieving a flotation on the Unlisted Securities Market (USM) in the U.K. via the placement method during the period 1984 to 1988 inclusive.

The USM has been chosen as the sample frame to examine the issue of whether small firms entrepreneurs are able to signal the potential value of their firms to investors because the express purpose of setting up this second-tier equity market in 1980 was to offer small firms a relatively cheap and accessible method of obtaining a public listing.¹ Firms seeking a USM flotation require a trading record of three years (in exceptional cases, new ventures are accepted), as compared to that of five years required by the main market.² Hence the USM allows firms to gain access to additional equity finance sooner in their life cycle than would otherwise be the case. The minimum amount of equity required to be held in public hands is 10% for a USM listing, compared to 25% on the Official List. Finally, a USM listing is less costly due to its considerably less stringent advertising and compliance requirements, *vis-à-vis* the Official List.³ Since the USM became operational in 1980, more than 750 firms have obtained a listing and have raised capital sums ranging from £100,000 to over £10m.

The analysis is restricted to the placement method of floating a new issue in order to control for possible differences that may arise between the various methods of flotation. Indeed, Heinkel and Schwartz (1986) derive a model in which the method of flotation itself acts as a signal of firm value. Under the placement method, shares are initially 'placed' by the sponsor or broker with institutional or private clients. The shares are purchased at the issue price by the sponsor or broker, who then sells them to his/her clients at the same or marginally higher price. This is an extremely popular method of flotation on the USM as the costs involved with gaining entry via this method are lower than the alternative 'offer for sale' method.⁴

The data set is restricted to the period 1984 to 1988 inclusive because prior to 1984 the USM showed signs of significant instability in its early years of operation. In addition, a period of market operation is required in order to 'establish' reputations of the advising agents. During the sample period, 356 firms were floated on the USM via a placing out of a total of 444 flotations. However,

the sample was reduced to 231 firms due to insufficient data and the exclusion of foreign firms. The data required for the analysis was drawn from the Peat Marwick McLintock USM Quarterly Surveys, the Hoare Govett Directories of the USM and the Extel financial information service. Share price data and USM index data were drawn from Datastream.

b) Variables

The dependent variable (V) used in this analysis as a measure of initial firm value is the market capitalisation of the firm on flotation, that is, the issue price multiplied by the number of shares in issue. The explanatory variables are summarised in Figure 1 and are described below.

The variables included in the analysis to test for the ability of the entrepreneur to signal his/her private information concerning firm value are the percentage of equity retained (RE), the net proceeds raised from the issue of new shares (NEWMON), the quality of advising agents (ACC, SPONBROK), changes in the choice of advising agents (AUDIT and MERCH), the disclosure of an earnings forecast (HPF) and the level of underpricing (HQD and LQD).

RE — is the percentage of equity retained post flotation by the original entrepreneurs. This variable is hypothesised to be positively related to the dependent variable V under the model proposed by Leland and Pyle. However, if, as suggested by Trueman (1986a), RE operates as a joint signal of firm value with the level of planned capital expenditures, then the relationship is unsigned.

NEWMON — is the net (of flotation costs and the proceeds of the sale of shares by the original entrepreneurs) proceeds raised from a new issue. This measure reflects the amount of new money raised by an issue and is that element of the issue proceeds which can be utilised directly in the firm. It is used as a proxy to capture the argument of Trueman (1986a) that the planned capital expenditure of a firm post flotation can signal firm value. This variable is unsigned due to its hypothesised joint relationship with RE.

ACC — represents the quality of the reporting accountant involved with the placement. It is coded 1 for high quality accountants and 0 otherwise. A firm of reporting accountants was consid-

DEPENDENT VARIABLE		
V	Market Capitalisation of the firm on flotation	
INDEPENDENT VARIABLES		EXPECTED SIGN
RE	Percentage of Post Offering Equity retained by Pre-Offering Shareholders	?
NEWMON	Net Proceeds raised on flotation	?
ACC	Reporting accountant quality dummy variable	+
SPONBROK	Sponsor and Broker quality dummy variable	+
MERCH	Sponsor/broker switch dummy variable	+
AUDIT	Auditor switch dummy variable	+
HPF	Prospectus forecast dummy variable	+
HQD	Level of underpricing for high quality sponsor and broker	+
LQD	Level of underpricing for low quality sponsor and broker	+
DE	Total debt divided by net assets at flotation	-
IND	Industry classification dummy variable	-
AEG	Firm's age in years	+
CV1	Coefficient of variation of earnings 3 years immediately prior to flotation for firms reporting increasing earnings.	+
CV2	Coefficient of variation of earnings 3 years immediately prior to flotation for firms reporting decreasing or fluctuating earnings.	-
TA	Total assets on flotation	+
PROFIT	Average profits for the 3 years immediately prior to flotation divided by net assets on flotation	+
GRO	% change in USM Datastream Index over 2 months prior to flotation	+

Fig. 1. Description of variables.

ered to be of high quality if it was a member of the top eleven firms in terms of the total number of placements dealt with by the end of 1988.⁵ These firms of accountants were consistently in the top eleven accountancy firms involved with placings for the time period under consideration. Therefore, a year-by-year ranking of accountant reputation was not necessary. All firms require a reporting accountant to be party to the placement. The main role of the reporting accountant is to provide a report on the financial information contained in the prospectus or listing particulars. Whilst the

auditors to an issue usually act as the reporting accountants, these two roles may be filled by different firms.

AUDIT — in order to test the possibility that the appointment of a firm of accountants, other than the firm's existing auditors, to the role of reporting accountant may act as an additional signal to potential investors, a dummy variable is coded 1 if auditor and reporting accountant differ, 0 otherwise.

Firms entering the USM require the services of a sponsor and broker, whose roles are to co-

ordinate the process of flotation. A sponsor may be an issuing house (merchant bank) or a stockbroker. As it is necessary to appoint a broker to be responsible for the relationship between the firm and the Stock Exchange, it is common for the broker to also act as the sponsor.

SPONBROK — represents the quality of both the sponsor and the broker involved in the placement and is coded 1 if both the sponsor and the broker are of high quality, 0 otherwise. A sponsor or broker was regarded as being of high quality depending on the number of placements dealt with in the preceding years. The number of placements used as the cut-off point for distinguishing between high and low quality differed each year, based on the percentage of total placings. For example, in 1984 a broker was classed as being of high quality if it had been involved with 4 or more placings in the period 1980 to 1983. Such brokers, comprising of approximately 30% of all brokers involved with placings, were involved with 60% of all placings in that time period. Similarly, in 1985 a broker was considered to be of high quality if it had been involved with 5 or more placings in the time period 1980 to 1984. Therefore, for each firm, their sponsors and brokers were classed as being of either high or low quality. Several different variations of sponsor and broker quality variables were derived, but were found to make no significance to the final results. In particular, variables SPON, representing sponsor quality and BROK, representing broker quality were included in the analysis. However, due to the fact that the majority of firms used the same firm as sponsor and broker, the inclusion of these two variables caused serious multicollinearity problems.

MERCH — the broker to an issue usually acted as the sponsor. However, in some cases, a firm other than the brokers, typically a merchant bank, was appointed to the role of sponsor. To test for the potential effects of the use of different firms of sponsors and brokers, a dummy variable was coded 1 if sponsor and broker differed, 0 otherwise.

HPF — all firms entering the USM by way of a placing are obliged to provide a prospectus. In many cases, the prospectus provides a directors' forecast of future earnings, typically for the next accounting year. However, there is no legal obliga-

tion on the part of the firm or its advisers to provide a forecast. As discussed, the inclusion of an earnings forecast in the prospectus may act as a signal to investors as to the future earnings potential of the firm. Furthermore, the provision of a prospectus forecast may only be interpreted as a credible signal to firm value if it is ratified by a high quality accountant. Therefore, we include a dummy variable, HPF, coded 1 if a forecast is provided in conjunction with a high quality accountant, 0 otherwise.⁶

DISC — is the level of underpricing of the new issue. Whilst there may be many ways of defining underpricing, for the purposes of this paper, Tinic's (1988) measure of underpricing is used. This measure DISC is defined as:

$$\ln[P_{it}/P_{i0}] - \ln[I_t/I_0],$$

where P_{it} = Share price at the close of the t th day of trading;

P_{i0} = Offer price (i.e., share price at flotation);

I_t = USM Datastream Index at the close of the t th day of trading;

I_0 = USM Datastream Index at flotation.

For the results reported in this paper, t is taken as the 5th day of trading. DISC was calculated using various trading intervals, such as 2 days and 10 days and also different methods of underpricing were tested (for example, percentage discounts). However, the different methods of calculation and different intervals made no significant difference to the results. Despite the arbitrariness of the calculation of such discounts, the measurement of underpricing over the first five days of trading is widely used in the literature (see, for example, Buckland, Herbert and Yeomans, 1981; and Tinic, 1988). The level of underpricing is hypothesised to be positively related to firm value as modelled by Grinblatt and Hwang (1989) etc.

HQD and LQD — given the possible inverse relationship between adviser quality and underpricing, two further underpricing/agent quality control variables are included in the analysis. HQD is coded equal to the level of underpricing, DISC, if the firm's sponsor and broker are of high quality (that is, if SPONBROK is coded 1), and 0 otherwise. Similarly, LQD is coded equal to the level of underpricing DISC if the firm's sponsor/

broker is of low quality (that is SPONBROK is coded 0), and 0 otherwise. Whilst both HQD and LQD are hypothesised to be positively related to firm value, the coefficient of HQD is expected to be less than that of LQD. This is due to the relationship between adviser quality and underpricing — firms employing high quality advisers are hypothesised to use a reduced level of underpricing as a signal of firm value.

Several variables are included in the analysis to control for firm specific risk and performance.

DE — is the total amount of debt at the time of flotation divided by the net assets at flotation, and is hypothesised to be inversely related to firm value.

IND — is a dummy variable based on a firm's industrial classification and is coded 1 if the firm belongs to the electricals, engineering, textiles, oil, gas or miscellaneous industrials classification, and 0 otherwise. It is included to control for the possibility that certain industries tend to be subject to a greater degree of risk than others.

AGE — is the firm's age in years, included to control for the possibility that younger firms will be considered to be riskier than those with a longer trading record.

CV — is the coefficient of variation of annual earnings for 3 years immediately prior to flotation. It may be hypothesised that the greater the variation in pre-flotation earnings, the greater the perceived risk of the firm. However, given that new entrants to the USM are typically growing firms, the variation in pre-flotation earnings is likely to be perceived as an indication of continuing growth if such earnings were increasing over time, and hence would be expected to be positively related to firm value. In other words, it is not enough to simply measure the degree of variation, there is also a need to control for the direction of variation. Consequently, firms were classified into two groups dependent on the direction of the change in earnings. CV1 is coded equal to CV if annual earnings are increasing over all the three years prior to flotation, and 0 otherwise. Similarly, CV2 is coded equal to CV if earnings are decreasing or fluctuating prior to flotation, and 0 otherwise. It is hypothesised that CV1 will be positively related to firm value, being an indication of future growth prospects. CV2 is hypothesised to be negatively related to firm value, as firms with

decreasing or fluctuating pre-flotation earnings may be considered to be more risky than others.

TA — is the total assets of the firm immediately prior to flotation. This variable is included to control for the influence of size on market value.

PROFIT — is the average earnings of the firm in the 3 years immediately prior to flotation, divided by net assets on flotation, and is included to control for the possibility that firms with higher profits will be valued more by the market.

GRO — is included to capture the state of the market at the time of the placing and is calculated as the percentage change in the Datastream USM index in the 2 month period (40 trading days) prior to flotation. Whilst this measure is primarily used to measure market uncertainty, it also acts to capture other market effects, such as the 'hot issue' phenomenon (see Ritter, 1984).

c) *Empirical methods*

The empirical analysis used TSP software and consists of 'Halbert-White' adjusted least squares regressions of the market capitalisation dependent variable on the signalling and control explanatory variables outlined in the previous section. Due to the skewness of the distributions of the continuous variables V, NEWMON, DEBT, AGE, TA and PROFIT, the natural log forms of these variables were used in the analysis.⁷ In view of the possibility of the existence of heteroskedasticity, the Halbert-White correction technique was employed. This technique was used by Krinsky and Rotenberg (1989) and calculates standard errors which are robust in the presence of unknown heteroskedasticity. Hence the standard errors of the coefficients of the independent variables reported in this paper are heteroskedastic-consistent estimates.⁸

Empirical results

Summary statistics and a correlation matrix for the variables included in the regressions are presented in Appendices I and II respectively. Whilst some correlation exists between the explanatory variables, it is not sufficient to pose serious problems.

The results of the least squares regression of market capitalisation, LN (V), on the signalling and control explanatory variables are presented in Table I. The significance of the t-statistics are cal-

TABLE I
OLS regression estimates (hetroskedasticity-consistent
covariance matrix)

Variable	Estimated coefficient	Standard error	T-statistic
LN (DE)	-0.462	0.049	-9.417 ^a
LN (AGE)	-0.029	0.020	-1.451
IND	0.012	0.039	0.319
LN (PROFIT)	0.495	0.038	12.975 ^a
LN (CV1)	0.449	0.068	6.626 ^a
LN (CV2)	0.175	0.282	0.621
LN (TA)	0.568	0.036	15.638 ^a
GRO	0.004	0.002	2.018 ^a
RE	0.012	0.002	5.293 ^b
LN (NEWMON)	0.075	0.015	4.945 ^b
AUDIT	-0.028	0.057	-0.499
ACC	0.035	0.058	0.606
SPONBROK	0.050	0.068	0.732
MERCH	-0.010	0.044	-0.225
HPF	0.071	0.048	1.481
HQD	0.370	0.306	1.208
LQD	0.211	0.228	0.929
CONSTANT	3.724	0.280	13.309 ^b
N = 231	R ² = 0.689	F = 30.970	

^a Significant at 0.05 levels of confidence employing a 1-tailed test.

^b Significant at 0.05 levels of confidence employing a 2-tailed test.

culated employing 1-tailed and 2-tailed tests where appropriate. The coefficients of the variables representing firm size [LN (TA)], debt [LN (DE)], profitability [LN (PROFIT)], the coefficient of variation of earnings for firms reporting increasing earnings [CV1] and the growth in the USM Datastream index (GRO) are of the hypothesised sign and significant at the 0.05 level of confidence. Inspection of the signalling variables shows that only the retained equity variable RE and the net proceeds variable LN (NEWMON) are both positively correlated with firm value and statistically significant at the 5% level employing 2-tailed tests. Therefore, these results indicate that the market capitalisation of the firm on flotation is positively and significantly related to the percentage of equity retained by the original shareholders and the net proceeds raised from the sales of new shares. The results offer no support for the signals of underpricing, quality of advising agents and the issuing of an earnings forecast.

It was hypothesised that firms using high quality sponsors/brokers would underprice to a lesser degree than those firms employing low quality sponsors/brokers. However, inspection of the means of the variables HQD and LQD (presented in Appendix I) shows that the level of discount on new issues where high quality sponsors/brokers were used is in fact greater than that for firms employing low quality sponsors/brokers, although the difference is not significant. In addition, the correlation between SPONBROK, HQD and LQD is rather high, as would be expected given the definition of these variables. To further test the lack of significance of the level of underpricing in signalling firm value and to reduce collinearity, the variables HQD and LQD were replaced by DISC (the level of underpricing of the new issue without regard for the quality of sponsor or broker) in the regression. However, the analysis yielded similar results to those reported.

Conclusions

This paper has investigated whether the entrepreneurs of small and medium sized firms, when seeking a listing on the U.K. Unlisted Securities Market, are able to signal the value of their firms to potential investors via a number of potential signals. The signals considered were the percentage of equity retained post flotation, the net proceeds raised, the choice of advising agents, the disclosure of an earnings forecast and the level of underpricing of the new issue. In addition, attempts were made to control for the possible interactions between the quality of advising agents and the disclosure of an earnings forecast and the level of underpricing.

The results of the empirical analysis indicate that the market capitalisation of the firm on flotation is positively and significantly related to the percentage of retained equity and the net proceeds raised. The analysis offered no support for the quality of advising agents, the level of underpricing or the issuing of earnings forecasts acting as signals of firm value.

Therefore, the results of this paper offers some support for the general hypothesis that entrepreneurs are able to signal their private information to potential investors when floating their firms on the USM. Potential investors in the small to medium

sized firms that go for a listing on the USM seem to be willing to value such firms more highly if the original entrepreneurs signal their confidence in the future by the equity they retain and by the amount of capital expenditure they plan to undertake.

Notes

¹ Buckland and Davis (1989) evaluate the performance of the USM.

² This has recently been reduced to three years for the Official List and to two years for the USM.

³ Research by Buckland and Davis (1987) calculated that, for the period 1980 to 1985, the average flotation costs on the USM were £155,000 as compared to £789,600 for the Official List (all defined in 1985 prices).

⁴ A third method of floating on the USM is via 'introduction'. Under this method, no new shares are issued on entry to the market, but 10% of the firm's existing equity must be widely held.

⁵ The reporting accountants included in the top 11 are KMG Peat Marwick McLintock, Touche Ross, Arthur Andersen, Arthur Young, Ernst & Whinney, Deloitte Haskins & Sells, Cooper & Lybrand, Binder Hamlyn, Price Waterhouse, Grant Thornton and Stoy Haywood.

⁶ The inclusion of a dummy variable signifying merely the provision of a forecast was found to be insignificant.

⁷ The log form of the dependent variable was tested for normality using a statistic proposed by Jarque and Bera. The statistic is given by

$$\frac{(n-k)}{6} \left(S^2 + \frac{1}{4} (K-3)^2 \right)$$

where n is the number of observations, k is zero for an ordinary series, S is skewness and K is kurtosis. Under the null hypothesis of normality, the Jarque-Bera statistic is distributed chi-squared with 2 degrees of freedom. For LN (V), the statistic is 2.025, therefore at a confidence level of 0.05, the hypothesis of normality cannot be rejected.

⁸ This technique is available using many software packages including TSP which was used to conduct the analysis in this paper.

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Appendix I

Summary Statistics

Continuous variables

Variable	Mean	Standard deviation
LN (V)	8.907	0.547
LN (DE)	0.571	0.578
LN (AGE)	2.362	1.050
LN (CV1) ^a	0.643	0.384
LN (CV2) ^a	0.340	0.259
LN (TA)	7.620	0.940
LN (PROFIT)	-1.092	0.868
GRO	1.873	11.193
RE	73.841	8.890
LN (NEWMON)	6.280	1.741
HQD ^b	0.163	0.147
LQD ^b	0.140	0.174

Dummy Variables

Variable	Coded 0	Coded 1
AUDIT	189	42
ACC	51	180
SPONBROK	159	72
MERCH	154	77
HPF	137	94
IND	129	102

^a The summary statistics for the variables CV1 and CV2 are calculated excluding those firms which are coded 0. CV1 is calculated for 221 firms and CV2 for 10 firms.

^b The summary statistics for the variables HQD and LQD are calculated excluding those firms which are coded 0. HQD is calculated for 72 firms and LQD for 159 firms.

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