Intended Use of Proceeds, Underwriter Quality and the Long-Run Performance of SEOs in the UK

Abstract: We document that prospectus disclosure of (i) the motives for a seasoned equity offering and (ii) the choice of the underwriter explain the long-run performance of equity issuers in the UK. Firms citing investment needs show no abnormal performance after the offering and have higher investment rates post-issue compared to the period before the offering. Issuers that state general corporate purposes and recapitalisation motives underperform, have similar investment rates pre- and post-issue, and their leverage tends to increase after the offering. Further, consistent with the certifying role of underwriters, equity issues underwritten by high-quality brokers show no evidence of post-issue abnormal returns, but offerings taken public by low-quality underwriters exhibit negative abnormal performance. Together, our results document a significant role prospectus information on the intended use of offering proceeds and on the underwriter play in predicting issuers post-offering performance in the UK.

Keywords: *Seasoned equity offerings, post-issue underperformance, use of proceeds, underwriter quality*

JEL classification: *G2, G14, G32*

1. INTRODUCTION

A vast body of literature documents that seasoned equity offering firms (SEOs) underperform over three to five years after the issue.[1] However, little is known about how prospectus information on the issue motive and the choice of the underwriter help investors predict SEO post-issue performance, particularly outside the US market. This lack of evidence is surprising considering that investors are likely to closely scrutinize prospectus information to judge how the firm intends to use the proceeds since the issuer's prospects depend on it. Specifically, prospectus information can help investors separate firms issuing equity to finance value-increasing investment projects from market-timers that experience disappointing post-offering returns.

Using a large sample of UK SEOs, this study provides novel evidence that prospectus information on the intended use of the issue proceeds and on the underwriter predict SEO post-offering performance. The UK setting offers a unique research laboratory to test the signalling effect of prospectus information. The most common equity issuance methods in the UK, such as rights issues, open offers and share placements, are either first directed to existing shareholders or target a select group of large institutional investors (Barnes and Walker, 2006; Balachandran et al., 2013). Thus, in the UK, managers have less incentives to produce misleading or uninformative disclosure, e.g. to hide that the firm is timing the market, compared to the US setting where offerings to the public dominate (Capstaff and Fletcher, 2011). As a result, we would expect prospectus information to be useful in predicting SEO post-issue performance. Surprisingly, Ngatuni et al. (2007, 54) report that "[L]ong-term underperformance is pervasive

[1] Loughran and Ritter (1995) and Spiess and Affleck-Graves (1995) were the first to document SEO underperformance in the US. Levis (1995) provides early evidence on SEO underperformance in the UK, which studies by Armitage (2002), Ngatuni et al. (2007), Capstaff and Fletcher (2011) and Balachandran et al. (2013) corroborate. Massa et al. (2013) use a sample of 69 countries and show negative long-run returns after right offerings.

irrespective of the proposed use of funds".[2] Their evidence is puzzling and suggests prospectus disclosure in the UK is uninformative. It also contrasts US results in Walker and Yost (2008) and Autore et al. (2009), who document that prospectus information helps predict SEO post-offering performance. Further, reputational considerations are likely to be particularly important for UK underwriters as they transact repeatedly with the same group of institutional investors, particularly for share placements (Barnes and Walker, 2006). Yet, no study to date has examined if the choice of the underwriter signals SEO prospects in the UK.

We divide the empirical analysis into two parts. First, we examine SEO performance split by the intended use of proceeds (i.e., investment, recapitalisation and general corporate purposes) as disclosed in the offering prospectus. We predict that issuers disclosing investment needs signal positive NPV projects that require financing and these SEOs will not underperform after the offering. This prediction follows from Walker and Yost (2008) and Autore et al. (2009), who suggest that better post-offering performance of US SEOs that disclose investment needs is because these firms use proceeds to finance new value-increasing projects. We expect firms indicating recapitalisation and general corporate purposes to underperform. We base this prediction on the evidence in Hertzel and Li (2010), who argue that firms issuing equity for recapitalisation purposes are timing the market. Firms may also mask issues of overvalued equity by stating vague motives for the offering such as general corporate purposes.

Empirical results confirm our predictions. Firms stating investment purposes when issuing new equity do not underperform relative to both size, and size and book-to-market benchmark firms over three years subsequent to the offering. Further, these SEOs show a 185%

[2] Contrary to our study, Ngatuni et al. (2007) focus on the comparative analysis of post-offering performance for UK rights and open offers. Only one table (Table 6) in their study reports SEO performance split by the intended use of proceeds with the analysis limited to rights issues only. We compare our study to Ngatuni et al. (2007) in detail later in this section.

increase in investment rates after the offering. These findings are consistent with these issuers credibly signalling their need for cash to finance new projects. SEOs reporting general corporate purposes and recapitalisation motives for the offering underperform. The three-year post-issue abnormal returns of SEOs stating general corporate purposes and recapitalisations is −9.35% and −45.38%, respectively, relative to size and book-to-market benchmark firms. Further, these SEOs have similar investment rates pre- and post-issue, and their leverage tends to increase after the offering. This evidence suggests an increase in the agency cost of free cash-flow after the offering (Jensen, 1986) and is consistent with these issuers timing offerings to periods where their stock is temporarily overpriced. Together, our evidence confirms that prospectus information on the intended use of offering proceeds helps investors identify firms with better post-offering prospects.

In the second part of the study, we examine the association between underwriter quality and SEO long-run returns. Previous US studies argue that high-quality underwriters certify the issue quality and reduce moral hazard and adverse selection in the equity issue process (Chemmanur and Fulghieri, 1994; Booth and Smith, 1986). Certification happens because high-quality underwriters refrain from underwriting poor quality issues to protect their reputation. Reputational considerations should be particularly important for UK underwriters as they frequently transact with the same group of institutional investors (Barnes and Walker, 2006). Empirical tests confirm that underwriter reputation predicts SEO post-issue performance in the UK. Specifically, SEOs underwritten by high-quality brokers show no evidence of underperformance. Issuers sponsored by low-quality underwriters exhibit three-year post-issue underperformance of around −12.62% when benchmarked against firms with similar size and

book-to-market ratio. Our evidence suggests that high quality brokers help resolve information asymmetries related to the issue quality in the UK.

Our conclusions that prospectus information on the intended use of offering proceeds and on the choice of the underwriter signal issuer prospects are the same when we use calendar-time regressions and benchmark SEO returns against the Fama and French (1993) and the Carhart (1997) models, the Liu's (2006) liquidity-augmented CAPM, and the Fama and French (2015) five-factor model, which includes investment and profitability factors. These results suggest that our conclusions are not driven by the misspecification of the normal return model (Fama, 1998). Further, our findings remain unchanged for subsamples split by industry, sample period and listing exchange (i.e., the London Main Market and the London Alternative Investment Market). The conclusion that underwriter quality predicts SEO performance is also robust to alternative measures of broker quality. Finally, using a multivariate regression framework, we confirm that our main conclusions persist when we control for other predictors of SEO post-issue performance. Multivariate regressions also show that the variation in abnormal returns due to the issue motive is independent of the variation due to the underwriter quality effect, in other words, issuers with investment motives are not systematically underwritten by high quality brokers. This result suggests that disclosure of both the issue motive and of the underwriter are useful to investors in predicting SEO post-offering performance.

Our main tests focus on long-run SEO performance. To corroborate these tests, we also examine price reactions to equity issue announcements, which commonly include information on the issue motive and the underwriter.[3] Similar to the long-run evidence, we document that

[3] Issuers in the UK are strongly encouraged to disclose their intended use of the proceeds when they announce new issues. The "Guide to Listing on the London Stock Exchange", recommends that "if a company is raising new capital, the use of proceeds should be clearly articulated and in line with its strategy" ('A guide to listing on the London Stock Exchange', 2010, p.22).

investors react more positively to SEOs that state investment needs than to issuers with other motives. To illustrate, the abnormal price reaction to SEOs with investment needs is 2.66% in a four-day window centred on the offering announcement, but −2.56% for SEOs stating recapitalisation needs. Multivariate regressions that control for issuer characteristics and the choice of the flotation method confirm the signalling role prospectus information has at the offering announcement.[4]

This study extends and enhances the SEO literature in three critical ways. First, our paper adds to the fledgling international literature that examines the signalling role of the offering prospectus. We question the conclusion in Ngatuni et al. (2007) and report novel results on the association between prospectus disclosure of the issue motive and long-run SEO performance in the UK.[5] Further, because compared to the US, the UK institutional setup more closely resembles that of major international equity markets, where SEOs are primarily conducted via methods that allow subscription by existing shareholders (Cronqvist and Nilsson, 2005; Eckbo and Norli, 2007; Balachandran et al., 2008, 2013), our conclusions are more likely to generalize to other international markets than the US evidence. This contribution is particularly important because the use of issuance methods that target existing shareholders has been increasing over time (McLean et al., 2011; Massa et al., 2013). Further, survey results in Richardson et al. (2010)

[4] As in Armitage (2002), we do not find a significant relation between underwriter quality and price reactions to equity issue announcements. This result may reflect that investors are initially sceptical about the ability of underwriters to discriminate between high- and low-quality issues.

[5] As we explain in detail later in text, we attribute the discrepancy between our results and Ngatuni et al. (2007) to differences in sample selection criteria, research methods, and a longer sample period in our study, which increases power of our tests. Specifically, Ngatuni et al. (2007) limit their analysis to rights issues and exclude firms that delist before the end of the five-year event period, which leads to sample selection and survivorship bias. We do not impose these sample selection restrictions and include share placements, which became an important issue method in the UK after 1996 (Balachandran et al., 2013). Further, Ngatuni et al. (2007) focus on rights issues and their sample period coincides with the period where UK issuers were less likely to time rights issues to exploit stock overvaluation (Capstaff and Fletcher, 2011), which reduces power of their test to identify market-timers. Finally, Ngatuni et al. (2007) acknowledge that their use of event-time analysis only may overstate issuers' negative performance, thus bias against finding that the offering prospectus discriminates between market-timers and SEOs with good prospects. Our study shows consistent evidence on the signalling effect of the issue motive and underwriter quality using event- and calendar-time methods, for subsamples and using multivariate regressions.

highlight that the majority of practitioners believe more international research is necessary because the US evidence may not generalize to other countries.

Second, our study is the first to document the certifying role of high quality underwriters for new equity issues in the UK. This result highlights that even in markets dominated by right offerings and share placements that associate with lower information asymmetries, underwriters are important in resolving information asymmetries around the equity issue. The evidence that underwriters certify the issue quality is crucial in light of the increasing criticism of the amount of fees charged by investment banks for advising on share offerings in the UK.[6]

Finally, our evidence on the usefulness of prospectus disclosure has important implications for corporate financing decisions in the UK. Previous evidence suggests that SEOs have disappointing returns after the offering (Levis, 1995; Armitage, 2002; Ngatuni et al., 2007; Capstaff and Fletcher, 2011), which can discourage listed firms from seeking equity financing in favour of bank lending. However, following the financial crisis, higher capital requirements led banks to reduce their asset size and lending, constraining loan-financed growth (Aiyar et al., 2014; Giovannini et al., 2015). Our evidence suggests that investors pay close attention to prospectus information and better quality firms can signal their prospects to investors separating from market-timers, thus avoid potential underinvestment problem.

[6] Levis et al. (2014) highlight that the UK government commissioned a number of reports to examine the economic justification for the fees charged by investment banks in the equity issue process (e.g., Underwriting of Rights Issues: A Study of the Returns Earned by Sub-underwriters from UK Rights Issues, Office of Fair Trading Research Paper No 6, 1994; Underwriting of Equity Issues -- A report by the Director General of Fair Trading, 1995; Underwriting of Equity Issues -- A second report by the Director General of Fair Trading, 1996; MMC Final Report: Underwriting Services for Share Issues, 1999).

2. LITERATURE REVIEW AND HYPOTHESIS DEVELOPMENT

2.1. Intended Use of Proceeds and the Long-run Performance of Seasoned Equity Issuers

Loughran and Ritter (1997) and Balachandran et al. (2008) emphasise the role of agency problems and information asymmetry between management and investors in explaining SEO short- and long-run performance. They argue that managers may be able to influence investors' expectations about future performance by the type of information they disclose to investors. Consistent with this proposition, Walker and Yost (2008) examine investor reaction to announcements of 438 equity offerings in the US, conditional on the intended use of the proceeds disclosed on the issuers' registration statements (S-3 form) filed with the Securities and Exchange Commission (SEC). They report that investors react more favourably to issue announcements for firms stating investment reasons than for firms that are vague and state general corporate purposes. They conclude that the intended use of the issue proceeds allows investors to assess the quality of the offering, and that the market perceives firms stating general motives for the issue as being more likely to engage in value-destroying projects.

Autore et al. (2009) examine 880 SEOs in the US from 1997 to 2003 and divide the offerings into three groups: firms stating investment reasons for the issue, recapitalisation, and general corporate purposes. They find that issuers citing recapitalisation and general corporate purposes experience negative abnormal returns over three years after the issue, but issuers disclosing investment purposes show no evidence of underperformance. Their results suggest that "issuers with specific plans to use the proceeds for investment purposes are credibly signalling profitable investment opportunities, whereas issuers without specific investment plans are more likely to be opportunistic market timers" (Autore et al., 2009, p.358).

Contrary to the US evidence, Jeanneret (2005) documents that French SEOs that state investment needs for the issue underperform over a three-year period after the offering. Issuers intending to use proceeds to finance debt repayments do not exhibit abnormal performance. Jeanneret (2005, p. 101) builds on the capital structure irrelevance theory and argues that SEOs made for pure capital structure concerns are not informative as "adjustments in the capital structure are expected to have no impact on the firm value". In contrast, issuers stating investment needs are "sensitive to adverse selection problems or agency conflicts and thus, they should be more exposed to under-reaction on the long-run", Jeanneret (2005, p. 99).

Ngatuni et al. (2007) examine post-offering performance for rights and open offers in the UK. As part of the analysis, their Table 6 reports associations between the proposed use of funds disclosed in the offering prospectus and issuer post-offering performance. For a sample of rights issues between 1986 and 1995, they find pervasive long-term underperformance irrespective of the proposed use of funds. Based on the previous evidence, our first set of hypotheses is:

Hypothesis 1a: Issuers stating investment needs in the offering prospectus do not exhibit abnormal performance after the offering.

Hypothesis 1b: Issuers stating recapitalisation and general corporate purposes show negative abnormal performance after the offering.

2.2. Underwriter Quality and the Long-run Performance of Seasoned Equity Issuers

Hiring a reputable underwriter can serve as a signal of issuer quality and mitigate adverse selection costs inherent in the equity offering process (Slovin et al., 2000; Chemmanur and Fulghieri, 1994; Booth and Smith, 1986). Certification happens because high-quality underwriters refrain from sponsoring poor quality issues to protect their reputation. If investors

fail to understand the certification role of underwriters, they overpay for issues underwritten by low-quality brokers, which leads to post-issue underperformance.

Previous evidence on the certification role of underwriters comes mainly from the US market. Michaely and Shaw (1994) and Carter et al. (1998) document that underwriter reputation has a positive association with long-run IPOs returns. McLaughlin et al. (2000) use underwriter rankings from Carter et al. (1998) to examine the relation between underwriter quality and SEO post-issue performance, but find no significant association. Jo et al. (2007) revisits the evidence in McLaughlin et al. (2000) using a more recent SEO sample and find a significant positive association between underwriter quality and SEO long-run performance.

In Japan, Suzuki and Yamada (2012) examine whether the underwriter type and the intent to use the proceeds to repay loans predict SEO performance. They argue that the certification effect is stronger when underwriters have a lending relation with the issuer. Consistent with this prediction, they show that issues underwritten by banks with a lending relation with the issuer have higher SEO announcement returns and post-issue long-run performance than those underwritten by investment houses. However, if an issuer discloses that the intended use of the issue proceeds is for recapitalisation, bank underwriters are no longer associated with higher announcement returns and post-issue performance, in other words, the intent to recapitalise offsets the bank certification effect.

In the UK, Goergen et al. (2007) find no association between underwriter reputation and post-issue IPO long-run returns. Armitage (2002) examine the underwriter certification role for UK rights issues and open offers, but find no evidence that offerings underwritten by high-quality brokers elicit significantly more positive price reaction at the issue announcement. To date, no study has examined how underwriter quality affects SEO post-issue performance in the

UK. Given the increasing criticism of the high level of fees charged by investment banks for advising on share issues in the UK (Levis et al. 2014), it is important to understand the role underwriters play in the offering process. Thus, our second set of hypotheses is:

Hypothesis 2a: Issues underwritten by high quality brokers show no evidence of abnormal performance after the offering.

Hypothesis 2b: Issues underwritten by low quality brokers exhibit negative abnormal performance after the offering.

3. DATA AND SAMPLE SELECTION CRITERIA

We use the Securities Data Company's (SDC) Global New Issues Database to collect the sample of firms listed on the Main Market and the Alternative Investment Market (AIM) of the London Stock Exchange that issued seasoned equity between January 1994 and December 2007.[7] We select offerings of either primary shares or combinations of primary and secondary shares. We exclude firms where either the intended use of proceeds is not available on the offering prospectus or that state both recapitalisation and investment purposes. Following Lyon et al. (1999), we exclude seasoned offerings by the same firm that occurred during the three-year post-issue period of the previous offering.[8] Finally, we exclude offerings for which monthly returns, the book-to-market ratio and the market value of equity were not available on Datastream.[9] The

[7] We stop in 2007 as equity issues during the financial crisis where driven by unique market conditions and liquidity drought that forced firms to seek liquidity from shareholders.

[8] Lyon et al. (1999) argue that overlapping of event windows for the same company creates cross-sectional correlation that leads to misspecified test statistics.

[9] Ince and Porter (2006) highlight the need for caution in handling return data from Datastream. Following their recommendations, we apply the following commonly used screens to monthly returns (e.g., Hou et al., 2011; Karolyi et al., 2012): (i) we define days on which more than 90% of stocks on the London Stock Exchange have returns equal to zero as non-trading days, (ii) we discard returns above 300% that are reversed in one month i.e., if both R_t and R_{t+1} are greater than 300% and $(1 + R_t) + (1 + R_{t+1}) < 50\%$, then both R_t and R_{t+1} are set to missing, (iii) we set monthly returns to missing if the value of the total return index for the previous or the current

information on the lead underwriter and on the intended use of the issue proceeds is from the Securities Data Company (SDC) database, and we manually cross-checked it against offering prospectuses available from Perfect Information. Our main sample includes 1,678 equity offerings. Missing information on the lead underwriter reduces the sample to 1,546 issues when we consider the relation between underwriter quality and SEO performance.

As in Autore et al. (2009), we divide the intended use of proceeds into three categories. Issuers with investment motives are those where proceeds are intended to finance internal and external growth plans such as acquisitions, project financing and product development. Recapitalisation motivated issues include debt repayments, refinancing of bank or fixed income debt, and improvement of the balance sheet. Issues with general corporate purposes include offerings stating that the proceeds will be used for working capital or that do not mention either investment or recapitalisation purposes.

To split underwriters into high and low-quality, we follow two approaches. First, consistent with Abrahamson et al. (2011) and Levis et al. (2014), each year we rank all underwriters based on the total proceeds of SEOs underwritten in the past three years (*Proceeds Rank*). We consider the top decile of brokers as high-quality and the reminder as low-quality.[10] Second, we use data on underwriter reputation from Corwin and Schultz (2005) to identify top underwriters (*Corwin and Schultz Rank*). Their underwriter rankings include 669 investment banks involved in at least one IPO syndicate from 1997 to 2002 in the US and are based on the proportion of the offering proceeds. High-quality underwriters are those with a rank score of 1.64 or above. This threshold matches the proportion of brokers classified as high-quality based on the Proceeds Rank.

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month is below 0.01 and (iv) in order to exclude any remaining outliers, monthly returns are winsorised at the 1% level. The screens are applied simultaneously.

[10] Our conclusions are the same when we classify the top 5% or the top 20% of brokers as high-quality.

Figure 1 presents the time-series distribution of SEOs split by the intended use of proceeds and underwriter quality. Around 15% of SEOs in the sample state recapitalisation purposes, 52% indicate general corporate purposes and 33% specify investment needs. These proportions tend to be relatively stable over time, although between 2005 and 2007, general corporate purposes become the dominant motive for the issue. The percentage of high-quality underwriters is around 10%, with an average of 11 SEOs underwritten by high-quality brokers in a year.

[Figure 1 here]

4. MEASURES OF SEO POST-ISSUE RETURN PERFORMANCE

4.1. Buy-and-Hold Abnormal Returns

We measure SEO post-issue performance as the stock's buy-and-hold return (BHR):

$$BHR_i = \prod_{t=1}^{T}(1 + R_{i,t}) - 1 \quad (1)$$

where $R_{i,t}$ is the return of firm *i* in month *t*, and *T* is the earlier of the three-year issue anniversary or the delisting date. SEO abnormal return after the offering is calculated as the buy-and-hold abnormal return (BHAR). Specifically, BHAR for an issuing firm *i* is calculated as the difference between the BHR of the issuing firm and the BHR of a benchmark firm:

$$BHAR_i = \prod_{t=1}^{T}(1 + R_{i,t}) - \prod_{t=1}^{T}(1 + R_{benchmark,t}) \quad (2)$$

where $R_{benchmark,t}$ is the return of the benchmark firm at time *t*.[11]

[11] We use BHARs, rather than cumulative abnormal returns (CARs), as the method more closely reflects investor experience when buying SEO stocks and holding them for three years after the issue. BHARs also avoid the unrealistic rebalancing assumption implicit in CARs that leads to high transaction costs (Barber and Lyon, 1997). Kothari and Warner (1997) do not recommend using CARs since the method leads to positively biased abnormal returns.

Benchmark returns are returns of non-issuing stocks matched on (i) size and (ii) on size and book-to-market ratio (B/M).[12] We use size and book-to-market characteristics as risk controls following Banz (1981), Fama and French (1993) and Lakonishok et al. (1994), who show that these characteristics predict future stock returns. Further, Jegadeesh (2000) argues that issuers tend to be small, growth companies, while non-issuers are more likely to be large and mature firms, which suggests that matching on size and book-to-market is more appropriate when comparing SEO performance with that of non-issuing stocks. Matching on size and book-to-market also yields well-specified test statistics (Barber and Lyon, 1997).

We first match SEOs with benchmark firms on market capitalization measured at the fiscal year-end prior to the offering. As in Spiess and Affleck-Graves (1995), we pair each issuing firm with a non-issuing counterpart based on the closest, but higher, market value of equity. This is because market capitalisation of SEOs is expected to increase in the post-issue period. If the non-issuing firm delists before the end of the three-year holding period, we use returns of the second benchmark firm with the closest market capitalisation for the remaining holding period. The eligible benchmark firms are selected from a list of non-issuing firms with a market value of equity within the ±30% calliper of that for the issuing firm. Benchmark stocks include all firms listed on the London Stock Exchange excluding stocks that issued equity over the prior three years. For matching on size and book-to-market, we select the benchmark firm with the book-to-market ratio closest to that of the issuing firm from the pool of non-issuing firms in the 30% calliper matched on size.

To mitigate the problem of positively skewed long-term abnormal returns, we use the skewness-adjusted *t*-statistic from Lyon et al. (1999) defined as

[12] We use two normal return benchmarks to ensure our results do not reflect benchmark misspecification. Fama (1998) argues that misspecification of the benchmark model in event studies can produce evidence of abnormal performance even when it does not exist.

$$t_{SA} = \sqrt{N}\left(S + \frac{1}{3}\hat{\gamma}S^2 + \frac{1}{6N}\hat{\gamma}\right) \quad (3)$$

where $S = \overline{BHAR}_t/\sigma(BHAR_t)$ is the excess-return of equity issuers, *N* is the number of firms in the sample and $\hat{\gamma} = \sum_{i=1}^{n}(BHAR_{it} - \overline{BHAR}_t)^3 / N\sigma(BHAR_t)^3$ is the estimate of the skewness coefficient. We also report the non-parametric Wilcoxon signed-rank statistic that tests whether the median abnormal return is zero.

4.2. Calendar-time Analysis

Fama (1998) and Mitchell and Stafford (2000) advocate the use of the calendar-time approach since the method is less susceptible to the "bad model" problem and it does not compound spurious abnormal returns.[13] We use two regression models in the main analysis to test for abnormal SEO performance after the issue. First, we use the Fama and French (1993) three-factor model which controls for the size-effect, the book-to-market effect, and the market premium:

$$R_{pt} - r_{ft} = \alpha_{p0} + \beta_{mp}\left(R_{Mt} - r_{ft}\right) + \beta_{hp}SMB_t + \beta_{sp}HML_t + \epsilon_{pt} \quad (4)$$

where R_{pt} is the monthly return on a portfolio of stocks that issued equity within the past three-years and r_{ft} is the risk free rate. $R_{Mt} - r_{ft}$ is the market excess return, *SMB* is the average return on a portfolio long in small (S) and short in large (B) stocks based on their market capitalisation, and *HML* is the average return on a portfolio long in high (H) and short in low (L) book-to-market stocks. The intercept, α_{p0}, measures the mean monthly abnormal return after the offering.

Second, we use the Carhart (1997) four-factor model, which expands the Fama and French (1993) model by including a momentum factor. The model takes the form:

[13] The disadvantage of using the calendar-time method is that the approach has lower power to detect abnormal performance compared to event-time analysis. Loughran and Ritter (2000) show that using Fama and French (1993) model captures only 50% of true abnormal returns, compared with 80% captured by BHARs with size and-book-to-market matched firms as benchmarks.

$$R_{pt} - r_{ft} = \alpha_{p0} + \beta_{mp}\left(R_{Mt} - r_{ft}\right) + \beta_{hp}SMB_t + \beta_{sp}HML_t + \beta_{up}MOM_t + \varepsilon_{pt} \quad (5)$$

where MOM_t is the average return difference between portfolios of high and low momentum stocks.[14] We use the Carhart model since Fama and French (1996) show that the three-factor model fails to explain the Jegadeesh and Titman's (1993) momentum effect.

5. EMPIRICAL RESULTS

5.1. Intended Use of Proceeds and SEO Post-issue Performance

Table 1 reports mean BHARs for three years after the issue for the pooled sample and for the sample stratified by the intended use of proceeds. The mean BHAR for the pooled sample is −10.72% when using size and B/M benchmarks (Panel A) and −21.31% when using size-matching (Panel B), which is consistent with previous results that SEOs in the UK underperform after the offering (Levis, 1995; Ngatuni et al., 2007; Capstaff and Fletcher, 2011).

[Table 1 here]

We find no evidence of abnormal performance for SEOs stating investment reasons for the offering, but SEOs intending to use proceeds for general and recapitalisation purposes underperform. Specifically, mean BHAR for SEOs stating general corporate purposes is −9.35% using size and B/M matched stocks, and −26.03% using size matching. For SEOs indicating recapitalisations, the corresponding values are −45.38% and −66.36%. The evidence that SEOs stating recapitalisations and general purposes underperform suggests these issuers may be timing the offering to periods where the firm's stock is temporarily overvalued (Autore et al., 2009; Hertzel and Li, 2010).

[14] Fama and French (1993) and momentum factors for the UK are from Gregory et al. (2013). In creating the mimicking portfolio, Gregory et al. (2013) follow the Fama and French (1993) procedure.

Panels C and D report *t*-statistics testing the differences in BHARs across groups split by the intended use of the issue proceeds. On average, SEOs with investment motives outperform issuers stating general and recapitalisation reasons for both size and size and B/M benchmarks. This result suggests that firms stating investment purposes prior to the issue credibly signal better prospects. Further, we find a significant difference between abnormal returns for SEOs with general and recapitalisation needs. The evidence of more negative abnormal performance for SEOs with recapitalization motives is consistent with the evidence in Hertzel and Li (2010). Together, Table 1 results suggest that the intended use of the issue proceeds predicts SEO post-issue performance.[15]

To explain the reason for the differences in return patterns for SEOs split by the intended use of proceeds, Figure 2 plots mean investment-to-asset ratios and mean leverage ratios from one year before to three years after the offering for the three SEO groups. We follow Lyandres et al. (2008) and construct the investment-to-assets ratio as the sum of the annual change in property plant and equipment plus the annual change in inventories divided by lagged assets. Leverage is calculated as the ratio of total liabilities to total assets. Issuers stating investment reasons show a significant increase in investment rates, with the mean investment-to-asset ratio increasing from 0.48 one year before the offering to 2.34 in the issue year. This evidence is consistent with these firms using issue proceeds to finance new projects. Investment rates for the other two SEO categories do not show significant changes before and after the offering. Issuers stating recapitalisation purposes temporarily reduce leverage from 1.67 before the issue to 0.57 in the issue year. However, they subsequently increase their gearing. Similarly, SEOs stating general motives increase their leverage after the issue. Higher leverage and no evidence that cash is spent to finance new projects suggests more sever agency costs of free cash-flow for these

[15] In unreported tests we find that our conclusions are unchanged when we use a five-year post-offering period.

issuers (Jensen, 1986). In sum, the evidence in Table 1 and Figure 2 suggests that issuers stating recapitalisation and general corporate purposes are likely to be timing the market, which explains their subsequent poor return performance.

[Figure 2 here]

5.2. Underwriter Quality and SEO Post-issue Performance

Table 2 reports post-issue abnormal performance for issuers with high and low-quality underwriters. The split into high and low-quality underwriters is based on total proceeds of SEOs underwritten in the past 3 years, *Proceeds Rank*, and using broker quality ranks from Corwin and Schultz's (2005), *Corwin and Schultz Rank*.[16] Panel A measures abnormal performance relative to size and B/M benchmark stocks. We find no evidence that SEOs underwritten by high-quality brokers underperform after the issue independently of the measure of broker quality we use. In contrast, SEOs underwritten by low-quality brokers show negative abnormal returns of −12.62% over the three-year post-issue period when we use *Proceeds Rank* and −11.58% for *Corwin and Schultz Rank*. Panel B repeats the analysis from Panel A for size-matched benchmark stocks and produces similar conclusions. Panels C and D confirm that the differences in mean BHARs for SEOs underwritten by high vs. low-quality brokers are significant for all normal return benchmarks and for all measures of underwriter quality. Together, Table 2 results confirm that underwriter quality signals future SEO performance in the UK.

[Table 2 here]

[16] In unreported results, we find that our conclusions are unchanged when we use Jay Ritter's underwriter reputation rankings available at http://bear.warrington.ufl.edu/ritter/ipodata.htm.

5.3. Sensitivity analysis

In sensitivity tests, we first show that the evidence of no significant underperformance of equity issuers that state investment needs and of SEOs underwritten by high-quality brokers persists when we use calendar-time analysis. Second, we show that our conclusions are unaffected when we split SEOs by industry, sample period, and the listing exchange (i.e., the London Main Market and the London Alternative Market). Third, we report that our conclusions are not due to the choice of the normal return benchmark. Specifically, we show that our conclusions do not change when we use the liquidity-augmented CAPM (Liu, 2006) or the five-factor model of Fama and French (2015) which includes an investment and a profitability factor.

Table 3 documents that our conclusions from event-time analysis persist when we use calendar-time regressions.[17] Panel A reports results for the pooled sample and when we split SEOs by their intended use of proceeds. The mean monthly abnormal performance for the pooled sample is −0.70% for the Fama and French (1993) model and −0.63% for the Carhart (1997) model, which is economically significant and comparable with the estimates from the event-time analysis in Table 1. Splitting SEOs by the intended use of proceeds, we do not find evidence of SEO underperformance for firms indicating investment motive for the offering. SEOs stating general and recapitalisation uses underperform when we use both the three- and the four-factor models.

Panel B examines if our conclusions on the positive relation between broker quality and SEO post-issue performance persist when we use calendar-time regressions. Using the Fama and French (1993) model, we continue to find no evidence of underperformance by SEOs sponsored by high-quality brokers. However, SEOs underwritten by low-quality brokers underperform.

[17] For brevity, Table 3 reports only Jensen's alphas. The full table including factor loadings is available from the authors.

Panel C reports Jensen alphas for SEOs split by the intended use of proceeds and underwriter quality when we use the Liu's (2006) liquidity-augmented CAPM and the Fama and French's (2015) five-factor model as normal return benchmarks. Bilinski et al. (2012) use the liquidity-augmented CAPM to evaluate the long-run performance of US SEOs, and Capstaff and Fletcher (2011) use it to evaluate the performance of UK offerings. Nichol and Dowling (2014) examine the performance of the five-factor model in the UK and conclude that it offers "a marginal improvement over the widely used FF3 [Fama and French (1993) three-factor model]". We discuss the two models in Appendix A. We consider these models because the Fama and French (1993) and Carhart (1997) models may not be well-specified in the UK (Gregory et al., 2013; Michou et al., 2014).

Our conclusions are unchanged when we use the Liu's (2006) liquidity-augmented CAPM or the Fama and French's (2015) five-factor model. Specifically, we continue to find that SEOs stating recapitalisation and general corporate purposes underperform after the offering, but there is no evidence of abnormal performance for issuers stating investment needs. SEOs sponsored by high-quality brokers do not underperform, but offerings underwritten by low-quality brokers show significant negative abnormal performance.[18] Together, Table 3 results confirm that our conclusions are not sensitive to the way we calculate abnormal returns.

[Table 3 here]

In unreported results, we also examine if our conclusions do not change when we repeat the analysis for subsamples.[19] First, splitting issuers into five industries using the issuer's SIC

[18] In unreported results we find that our conclusions are also unchanged when we use (i) a four-factor model which includes the Fama and French (1993) factors and the liquidity factor; (ii) a five-factor model that consists of the Carhart (1997) model augmented by a liquidity factor; (iii) a four-factor model by Hou et al. (2015) that excludes the HML factor from the Fama and French (2015) five-factor model. Thus, our conclusions are not sensitive to the specification of the benchmark model.

[19] Subsample results are available from the authors upon request.

code and Kenneth French's industry classification, we continue to find that SEOs stating investment purposes do not underperform after the offering, but issuers stating recapitalisation and general purposes show on average significant and negative abnormal performance after the issue. These results confirm that our conclusions from Table 1 are not driven by industry effects. Second, the conclusions are unchanged when we examine SEO performance for sub-periods 1994–2000 and 2001–2007. This test confirms that our results are not confined to specific sub-periods. Third, our results remain the same when we examine post-issue performance for SEOs listed on the London Main Market and the London Alternative Investment Market (AIM). Fourth, we document that SEOs underwritten by high-quality brokers do not underperform in any industry, subperiod or listing exchange. This is different from performance of SEOs underwritten by low-quality brokers which consistently underperform. This result confirms that our conclusion on the certifying role of underwriters is not driven by differences in industry composition, the choice of the sample period, or the listing exchange for high compared to low-quality brokers. In sum, sensitivity tests support our conclusion on the signalling role of the prospectus information on the intended use of the issue proceeds and underwriter quality.

5.4. Cross-sectional Regression Analysis

Next, we examine if the signalling effects of the intended use of the issue proceeds and of the underwriter quality (i) persist when we control for other predictors of SEO post-issue performance and (ii) whether the two effects are independent. The first test responds to the criticism of the matching procedure in Bessembinder and Zhang (2013). They argue that although matching on firm size and B/M ratio is standard in the SEO literature, issuers are not necessarily well-matched on other relevant characteristics which can confound inferences. The second test examines if the evidence that SEOs underwritten by high-quality underwriters do not

underperform is not simply due to the fact that high-quality underwriters sponsor on average a larger proportion of SEOs stating investment purposes which, as we show, do not underperform after the offering.

To examine the two questions, we use the following multivariate regression model where the dependent variable is the size and-book-to-market matched BHAR for a three-year post-issue period:

$$BHAR_{it} = \alpha + \beta_1 Investment_{it} + \beta_2 GCP_{it} + \beta_3 UnderwriterQ_{it} + \gamma' X_{it} + \varepsilon_{it} \quad (6)$$

and $Investment_{it}$ is a dummy variable that takes a value of 1 if a firm states investment purposes for the issue, and 0 otherwise. GCP_{it} is an indicator variable that takes a value of 1 if the intended use of proceeds is for general corporate purposes, and 0 otherwise. To account for underwriter quality we include an indicator variable, $UnderwriterQ_{it}$ that takes a value of 1 if the equity issue has been underwritten by a high-quality underwriter, and 0 otherwise based on *Proceeds Rank*.[20]

The set of controls in vector X_{it} in model (6) include: (i) firm size ($Size_{it}$), to control for lower expected returns of smaller firms (Banz, 1981); (ii) the book-to-market ratio (B/M_{it}) and the investment-to-assets ratio (INV/A_{it}) to capture firms growth opportunities and investment needs, respectively; (iii) firm age at the equity issue (Age_{it}), as younger firms typically need more external capital to finance their investments than mature firms and may face higher information asymmetries compared to firms with long history of financial information available to investors (Bilinski and Mohamed, 2014); (iv) leverage ($Leverage_{it}$), defined as the ratio of total liabilities to total assets as highly geared firms may use issue proceeds to lower their leverage (Eckbo et al., 2000); (v) return-on-assets (ROA_{it}) which measures the marginal benefit

[20] Our conclusions remain the same when using the Corwin and Schultz's (2005) broker quality ranks to define $UnderwriterQ_{it}$.

of an investment (Chen and Zhang, 2010); intuitively, given a firm's discount rate, high profitability means high net present value of new projects, which stimulates new investment. Equation (6) also includes (vi) stock liquidity ($Liquidity_{it}$), which is Liu's (2006) $LM12$ measure as Eckbo et al. (2000) suggest that equity issues may improve stock's liquidity and reduce the firm's expected returns; (vii) momentum ($Momentum_{it}$) which is the pre-issue stock price performance measured as the six-month abnormal return before the offering and controls for potential stock overvaluation; (viii) issue proceeds, ($Proceeds_{it}$), as larger offerings may indicate attempts to time the market. Finally, we include the choice of the flotation method since Eckbo and Masulis (1992) and Balachandran et al. (2008, 2013) document that the choice of the equity issue method can signal issuer quality. Capstaff and Fletcher (2011) document that rights offerings in the UK perform better after the issue compared to other floatation methods and Balachandran et al. (2013) indicate that firms issuing to (internal) external shareholders (do not) experience long-term underperformance. To control for this effect, we include an indicator variable $Rights_{it}$ that takes a value of 1 for rights issues and 0 otherwise, and an indicator variable $Placements_{it}$ that is 1 for issue placements and 0 otherwise. Equation (6) also includes year and industry fixed-effects. Issue proceeds are from the SDC database and other explanatory variables are from Datastream and measured at the fiscal year-end prior to the offering.

Table 4 reports descriptive statistics for variables in equation (6). Due to higher data requirements, our sample for the cross-sectional regression reduces to 1,092 SEOs. The mean market value of an SEO firm is £485m, which is comparable with past UK studies (e.g., Ngatuni et al., 2007 and Capstaff and Fletcher, 2011). The mean B/M ratio is 0.611 and the investment-to-asset ratio is 0.113. On average, a firm has been listed on the exchange for close to 11 years and the mean leverage is 0.513. The average return-on-assets is −16.2%, and the mean number of

volume-adjusted zero-trading days is close to 21. Pre-issue share price run-up is on average 23.8%, consistent with the earlier evidence that issuers experience strong price run-ups prior to the offering (Loughran and Ritter, 2000). On average SEOs raise £68m in proceeds and the dominant issue method is stock placement (45.4%), which is consistent with the evidence in Balachandran et al. (2013) that this method became the most common SEO form in the UK after 1996. Rights issues make up 18.9% of the sample.

[Table 4 here]

Table 5 presents coefficient estimates for equation (6). *t*-statistics are reported in parentheses and are based on standard errors adjusted for heteroskedasticity and firm and year clustering. We use double-clustering since the residuals may be correlated across firms and over time.[21] Column *Model* (1) includes only the indicator variables for the intended use of the proceeds ($Investment_{it}$ and GCP_{it}) and for high underwriter quality ($UnderwriterQ_{it}$). *Model* (2) also includes the indicator variable for the choice of the issue method. *Model* (3) includes the full specification of equation (6). For all model specifications, we find significant coefficients on $Investment_{it}$ and GCP_{it}, which confirms the prediction that the intended use of proceeds as stated in the prospectus predicts SEO long-term post-issue performance. Further, the coefficient on $UnderwriterQ_{it}$ is positive and significant for all specifications, which confirms that issues underwritten by high-quality brokers have superior post-issue performance. Since the indicator variable for underwriter quality and the dummy variables for the purpose of the issue are all significant, the regressions confirm that the underwriter effect is independent of the issue motive effect. For *Model* (3), we also document that more profitable firms and more liquid stocks have

[21] In unreported results, we also followed Cameron et al. (2011) and re-estimated equation (6) with double-clustered standard errors bootstrapped for the time-series dimension (year) using the Wild bootstrap methodology. Our conclusions do not change when using this procedure.

higher post-issue returns. Overall, regression results confirm that the prospectus disclosure of the motives for a seasoned equity offering and the choice of high-quality underwriters explain long-run performance of equity issuers in the UK. [22]

[Table 5 here]

5.5. Price Reactions to Equity Issue Announcements

To provide corroborating evidence that prospectus information helps investors distinguish SEOs with better post-offering prospects, we also examine price reactions to equity issue announcements. Short-horizon tests are largely immune to the misspecification of the normal return model (Kothari and Warner, 2008), which means that the conclusions from price reaction tests cannot be attributed to the "bad model" problem.

Consistent with the long-horizon evidence, we expect to find more positive price reactions to equity issues announcements stating investment purposes compared to offerings with general and recapitalization needs. Table 6 reports cumulative, market-adjusted abnormal returns (CARs) around equity issue announcements across various event windows starting two days before the announcement and ending two days after. Panel A reports price reactions for SEOs split by the issue motive. For all event windows, we observe a significant positive price reaction to equity announcements motivated by investment needs, but a negative price reaction where firms state recapitalization purposes. To illustrate, an average five-day CAR centred on the announcement day is 2.66% for issues stating investment needs, but −2.56% for issues citing recapitalization motives. SEOs with general corporate purposes have zero price reactions.

Panel B documents no significant association between broker quality and price reactions to issue announcements, which is similar to results in Armitage (2002). Given our long-run

[22] Our conclusions are similar using BHARs with benchmark firms matched on size only and when using BHARs calculated over five-years after the offering.

evidence that SEOs sponsored by high quality brokers do not underperform, short-horizon results may reflect that investors are initially sceptical about ability of underwriters to discriminate between high and low-quality issuers. Together, Table 6 evidence confirms our earlier result that SEOs stating investment needs are of better quality compared to the remaining SEO groups as investors react more positively to these offering announcements. Investors recognise that SEOs stating recapitalisation motives are likely to have poor future performance (as these firms suffer more from agency cost of free cash flow after the offering) and discount those SEOs more strongly at the issue announcement.

[Table 6 here]

Next, we repeat equation (6) where the dependent variable is the price reaction to equity issue announcements. The model has the form:

$$CAR(-2,2)_{it} = \alpha + \beta_1 Investment_{it} + \beta_2 GCP_{it} + \beta_3 UnderwriterQ_{it} + \gamma' X_{it} + \epsilon_{it} \quad (7)$$

where the set of controls in X_{it} is the same as in model (6). Equation (7) tests if differences in price reactions to equity issues announcements in Table 6 are not due to differences in characteristics of issuing firms or the choice of the flotation method.

Table 7 reports regression results for equation (7). We continue to find that investors react more positively to equity issue announcements where the firm states investment and general corporate purposes compared to firms indicating recapitalisation needs. This result is consistent with long-horizon evidence from Table 5.[23] We do not find significant associations between

[23] Table 7 results also address possible timing of "good" vs. "bad" news releases related to the SEO event that could explain our long-run results. Specifically, managers may release "good" news about positive NPV projects before the SEO announcement, which means that the SEO event itself is largely anticipated and associates with no significant short- or long-run abnormal returns. In contrast, managers may delay "bad" news that associate with issues motivated by general corporate purpose or recapitalization needs, which means that the SEO announcement associates with "new" negative information. Our evidence on positive price reactions to SEOs announcements for firms stating investment purpose suggests that timing of "good" vs. "bad" news releases is unlikely to explain our main results.

underwriter quality and price reactions to equity issue announcements. Together, short-term price reaction results corroborate our main findings, namely that prospectus information on the intended use of offering proceeds helps investors identify SEOs with better prospects.

[Table 7 here]

6. CONCLUSION

This study documents that investors can use information from the equity offering prospectus on the intended use of issue proceeds and on the underwriter to predict SEO post-issue performance in the UK. We find that SEOs stating investment purposes do not exhibit abnormal performance after the offering, while SEOs intending to use the proceeds for general and recapitalisation purposes underperform. In addition, we document a positive relation between underwriter quality and SEO post-issue performance in the UK: offerings sponsored by high-quality brokers show no evidence of abnormal performance, but issues underwritten by low-quality underwriters underperform. Our conclusions are robust to alternative measures of abnormal returns and of underwriter quality, calendar-time regressions, subsamples split on industry, sample period and exchange of listing, multivariate regressions that control for other predictors of SEO post-issue performance, and when we focus on price reactions to equity issue announcements. Further, we show that the variation in abnormal returns attributed to the issue motive is independent of the variation due to the underwriter quality effect. Together, the results suggest that prospectus information on the intended use of proceeds and on the underwriter helps investors identify stocks with better post-issue prospects.

APPENDIX A

This section discusses the Liu's (2006) liquidity-augmented CAPM and the Fama and French (2015) five-factor model that we use to examine SEO performance in Table 3. The Liu's (2006) liquidity-augmented CAPM consists of the market factor and a liquidity risk factor

$$R_{pt} - r_{ft} = \alpha_{p0} + \beta_{mp}\left(R_{Mt} - r_{ft}\right) + \beta_{rp} LIQ_t + \epsilon_{pt} \tag{8}$$

where LIQ_t is the difference between the return on a low liquidity portfolio and the return on a high liquidity portfolio. Liu (2006) argues that the liquidity-augmented CAPM should exclude the SMB and HML factors because distress risk proxied by these two factors is a source of stock illiquidity i.e., liquidity risk should directly capture distress risk. Liu (2006) shows that the liquidity-augmented CAPM explains market anomalies associated with size, book-to-market, cash-flow-to-price, earnings-to-price, dividend yield, and long-term contrarian investment.

The liquidity factor is constructed based on Liu's (2006) *LM*12 measure defined as the turnover-adjusted number of zero-trading days:

$$LM12 = \left(number\ of\ zero\ daily\ volumes\ in\ prior\ 12\ months\ + \frac{\frac{1}{TR12_i}}{Deflator}\right) * \left(\frac{252}{NoTD}\right) \tag{9}$$

where *TR*12 is the sum of daily turnovers in the previous 12 months (expressed in percentage), *NoTD* is the total number of trading days over the past 12 months, and the deflator is chosen to be 20,000 to ensure $(1/TR12\ )/Deflator < 1$. Liu (2006,2010) argues that *LM*12 captures multiple liquidity dimensions and generates a more robust liquidity premium than bid-ask spreads, Hasbrouck's c, the number of zero daily returns, stock turnover, and return-to-volume.

The liquidity risk factor, LIQ_t, is then constructed on a monthly basis where we rank all stocks at the end of month *t-1* based on their market value and *LM*12. Specifically, we first

classify all stocks as either large (*B*) or small (*S*) according to their respective market capitalisation. Then, the bottom 30% of stocks based on *LM*12 are classified as high liquidity (*HL*) and the highest 30% as low liquidity (*LL*).[24] The liquidity factor is then defined as the monthly profits from buying one dollar of small, low liquidity stocks (*SLL*) and large, low liquidity stocks (*BLL*) and selling one dollar of small, high liquidity stocks (*SHL*) and large, high liquidity stocks (*BHL*) i.e., $LIQ = \frac{1}{2}(SLL + BLL) - \frac{1}{2}(SHL + BHL)$.

Fama and French (2015) propose a five-factor model to capture the cross-section of stock returns. The model includes the Fama and French (1993) factors described in equation (4) and a profitability and an investment factor. The model takes the form:

$$R_{pt} - r_{ft} = \alpha_{p0} + \beta_{mp}(R_{Mt} - r_{ft}) + \beta_{hp}SMB_t + \beta_{sp}HML_t + \beta_{ep}PROF_t + \beta_{bp}INV_t + \epsilon_{pt} \quad (10)$$

where *INV* and *PROF* represent stock portfolios with conservative minus aggressive investments and robust minus weak profitability, respectively. Investment is calculated as the percentage annual change in total assets (i.e., change in total assets from the fiscal year ending in year *t-2* to the fiscal year ending in *t-1*, divided by *t-2* total assets) and profitability is defined as the annual change in operating profit given a firm's book equity for the fiscal year ending in year *t-1*.

The profitability and investment factors are constructed by forming portfolios based on two independent sorts per calendar year: there are two size groups (breakpoint of 50%) and three groups based on either profitability or investment (breakpoints of 30% and 70%). In detail, we first classify all stocks as either large (*B*) or small (*S*) based on their market capitalisation. Then, we classify the top 30% of stocks as high profitability (*HP*) and high investment (*HI*), and the

[24] We use yearly-rebalanced FTSE350 constituents to construct the portfolios. Gregory et al. (2013) and Nichol and Dowling (2014) argue that this approach captures the investment opportunity set of institutional and international investors. In order to ensure consistency with the Gregory et al.'s (2013) construction of the *SMB*, *HML* and *MOM* factors, financial stocks and stocks with negative or missing book values are excluded from the sample.

bottom 30% of stocks are classified as low profitability (LP) and low investment (LI).[25] The profitability factor is then defined as $PROF = \frac{1}{2}(SHP + BHP) - \frac{1}{2}(SLP + BLP)$. The investment factor is defined as $INV = \frac{1}{2}(SLI + BLI) - \frac{1}{2}(SHI + BHI)$. As before, we use yearly-rebalanced FTSE350 constituents to construct the portfolios while excluding financial stocks and stocks with negative or missing book values.

[25] In Fama and French (2015), the HP (high-profitability) and LP (low-profitability) portfolios are respectively denoted "robust" and "weak" profitability portfolios, while the the LI (low-investment) and HI (high-investment) portfolios are denoted "conservative" and "aggressive" investment portfolios.

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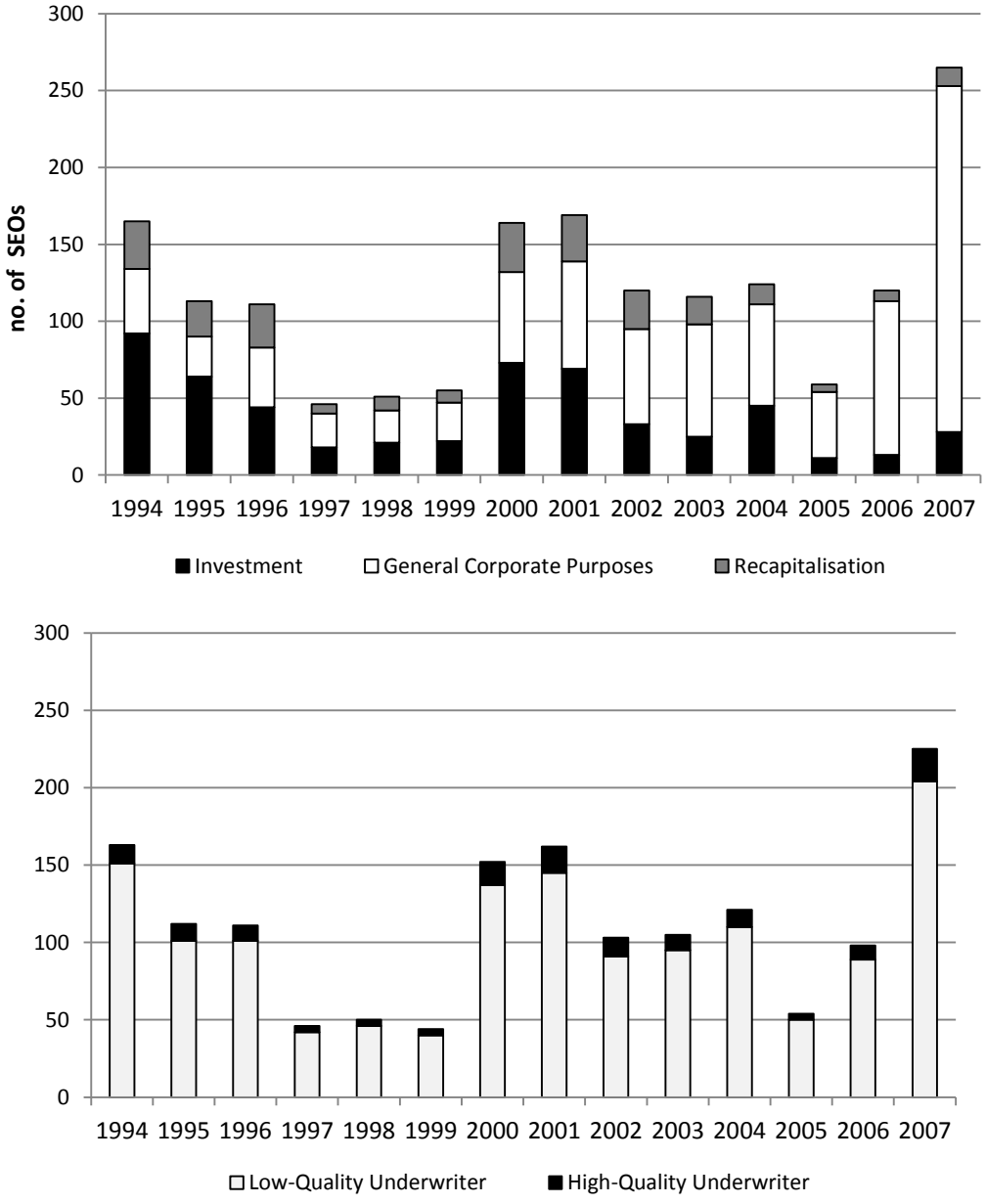
Figure 1

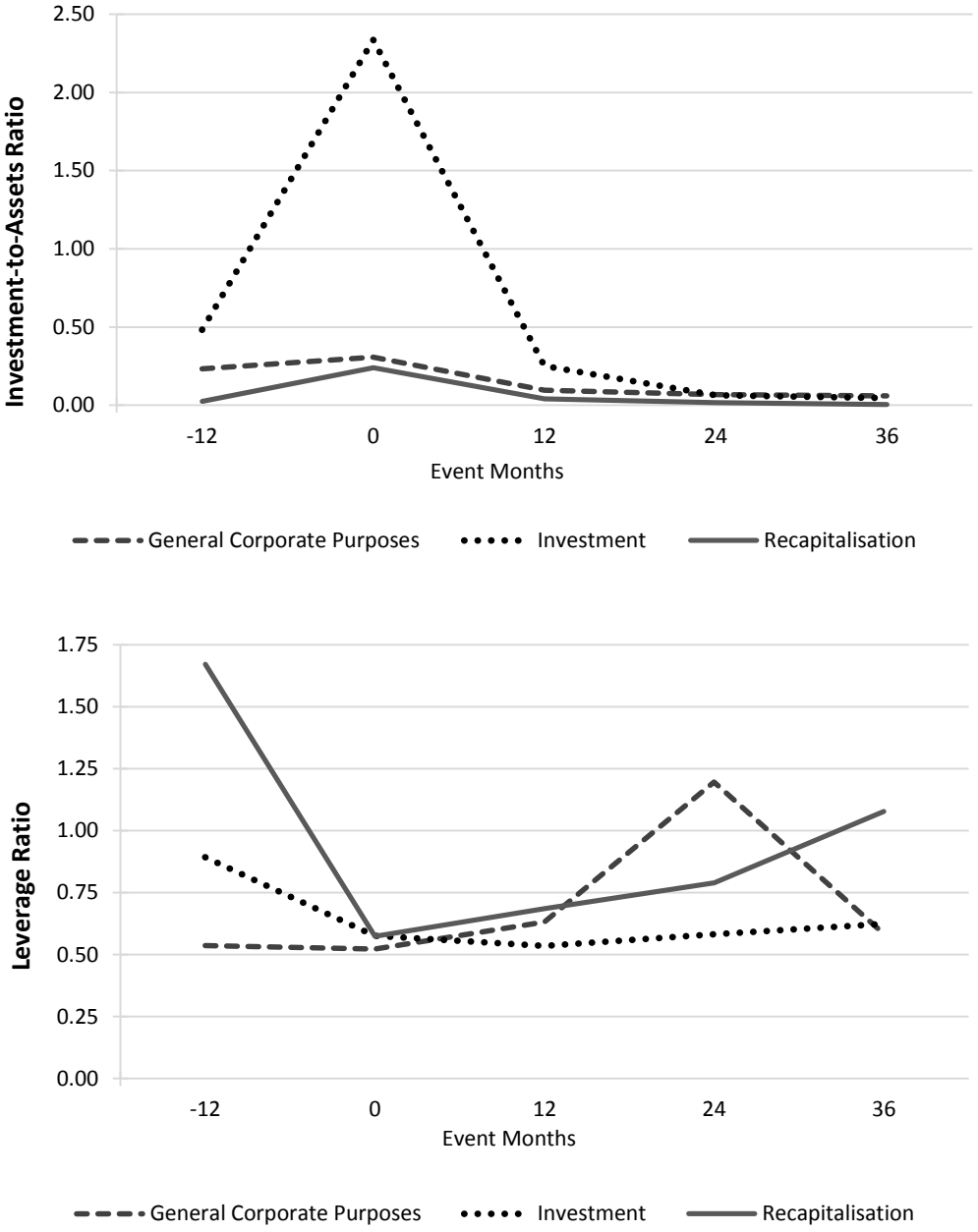
Distribution of the sample of UK SEOs over time



Notes: The figure reports the annual distribution of SEOs split by the intended use of proceeds and underwriter quality. The sample comprises 1,678 Seasoned Equity Offerings (SEOs) of common stock by UK firms listed on the London Stock Exchange over the period 1994−2007. The sample reduces to 1,546 observations due to missing information on the lead underwriter.

Figure 2

Investment and leverage before and after the equity issue



Note: The figure reports mean leverage and investment-to-assets ratio 12 months before the issue, in the issue month, and 12, 24 and 36 months after the offering. The ratios are reported for SEOs split by the intended use of proceeds (1,678 offerings over the period 1994−2007). The investment-to-assets ratio is the sum of the annual change in property plant and equipment with the annual change in inventories divided by lagged asset value. Leverage is the ratio of total liabilities to total assets.

Table 1

Long-Run SEO Performance and the Intended Use of the Issue Proceeds

	N	*Mean BHAR*	*SA t-statistic*	*Wilcoxon test*
Panel A: BHAR (%) matched on size and book-to market				
All issuers	1678	−10.72%	−2.715***	−102114***
Recapitalisation	247	−45.38%	−4.610***	−6669***
General Corporate Purposes	873	−9.35%	−2.467***	−32303***
Investment	558	3.13%	0.394	2369
Panel B: BHAR (%) matched on size				
All issuers	1678	−21.31%	−5.245***	−197953***
Recapitalisation	247	−66.36%	−7.404***	−9689***
General Corporate Purposes	873	−26.03%	−6.554***	−68391***
Investment	558	6.24%	0.867	951
Panel C: Differences in mean BHARs matched on size and book to-market				
Investment > General Corporate Purposes			*t*=1.390*	
Investment > Recapitalisation			*t*=3.801***	
General Corporate Purposes > Recapitalisation			*t*=3.421***	
Panel D: Differences in mean BHARs matched on size				
Investment > General Corporate Purposes			*t*= 3.742***	
Investment > Recapitalisation			*t*= 6.081***	
General Corporate Purposes > Recapitalisation			*t*= 3.984***	

Note: The table reports mean buy-and-hold abnormal returns (*Mean BHAR*) of issuers relative to matched non-issuing firms for three years after the offering. The sample size is 1,678 Seasoned Equity Offerings (SEOs) of common stock by UK firms listed on the London Stock Exchange from 1994 to 2007. The first rows in Panels A and B show BHARs for the pooled sample and subsequent rows report BHARs for SEOs split by the intended use of proceeds: general corporate purposes, investment and recapitalisation. Panels C and D report *t*-tests for the differences in mean BHARs from Panels A and B. *SA t*-statistic is the two-sided skewness-adjusted *t*-statistic and *Wilcoxon test* is the *W*-statistic of the Wilcoxon signed-rank test. *N* is the number of issues. *, ** and *** designate significance at the 10%, 5% and 1% level, respectively.

Table 2

Long-Run SEO Stock Performance by Underwriter Quality

	N	*Mean BHAR*	*SA t-statistic*	*Wilcoxon test*
Panel A: BHAR (%) matched on Size-and-BM				
High-quality Underwriter (Proceeds Rank)	144	9.47%	1.020	351
High-quality Underwriter (Corwin and Schultz Rank)	150	−0.76%	−0.112	−346
Low-quality Underwriter (Proceeds Rank)	1402	−12.62%	−2.776***	−79610***
Low-quality Underwriter (Corwin and Schultz Rank)	1396	−11.58%	−2.543**	−72343***
Panel B: BHAR (%) matched on Size				
High-quality Underwriter (Proceeds Rank)	144	−3.61%	−0.415	−473
High-quality Underwriter (Corwin and Schultz Rank)	150	−4.80%	−0.660	−796*
Low-quality Underwriter (Proceeds Rank)	1402	−24.70%	−5.307***	−151541***
Low-quality Underwriter (Corwin and Schultz Rank)	1396	−24.68%	−5.267***	−146311***
Panel C: Differences in mean BHARs (matched on Size-and-BM)				
High-quality > Low-quality Underwriter (Proceeds Rank)			*t*=2.200**	
High-quality > Low-quality Underwriter (Corwin and Schultz Rank)			*t*=1.357*	
Panel D: Differences in mean BHARs (matched on Size)				
High-quality > Low-quality Underwriter (Proceeds Rank)			*t*=2.207**	
High-quality > Low-quality Underwriter (Corwin and Schultz Rank)			*t*=2.438***	

Note: The table reports long-run SEO performance for issues underwritten by high and low-quality underwriters. The sample includes 1,546 issues with non-missing information on the lead underwriter. The sample is split into SEOs associated with high-quality and low-quality underwriters based on (i) Proceeds Rank and (ii) on underwriter reputation rankings from Corwin and Schultz (2005) with a threshold of 1.64 (i.e., high-quality underwriters have a rank score of 1.64 or above). Panel A reports three-year mean buy-and-hold abnormal returns (BHAR) of issuing firms relative to size and book-to-market matched non-issuing firms. Panel B reports mean three-year BHARs relative to size-matched non-issuing firms. Panels C and D report *t*-tests for the difference in BHARs for issues associated with low and high-quality underwriters reported in Panels A and B, respectively. *SA t-statistic* is the two-sided skewness-adjusted *t*-statistic. Wilcoxon test is the *W*-statistic of the non-parametric Wilcoxon signed-rank test. *N* is the number of equity issues. *, ** and *** designate significance at the 10%, 5% and 1% level, respectively.

Table 3

Calendar-Time Regressions for SEOs Split by the Intended Use of Proceeds and Underwriter Quality

	All Issuers (N=1678)		*Recapitalisation (N =247)*		*General Corporate Purposes (N =873)*		*Investment (N =558)*	
	FF3FM	*C4FM*	*FF3FM*	*C4FM*	*FF3FM*	*C4FM*	*FF3FM*	*C4FM*
Panel A: Calendar-Time Regressions for SEOs Split by the Intended Use of Proceeds								
Alpha	−0.70%***	−0.63%***	−1.16%***	−1.08%**	−1.01%***	−0.93%***	0.00%	0.05%
p	(0.0020)	(0.0020)	(0.0042)	(0.0042)	(0.0021)	(0.0022)	(0.0025)	(0.0024)
Panel B: Calendar-Time Regressions for SEOs Split by Underwriter Quality								
	High-Quality Underwriters (Proceeds Rank, N=144)		*High-Quality Underwriters (Corwin Rank, N =150)*		*Low-Quality Underwriters (Proceeds Rank, N =1402)*		*Low-Quality Underwriters (Corwin Rank, N =1396)*	
	FF3FM	*C4FM*	*FF3FM*	*C4FM*	*FF3FM*	*C4FM*	*FF3FM*	*C4FM*
Alpha	−0.31%	−0.04%	−0.34%	−0.16%	−0.73%***	−0.68%***	−0.81%***	−0.73%***
p	(0.0026)	(0.0027)	(0.0034)	(0.0034)	(0.0021)	(0.0021)	(0.0020)	(0.0022)

Panel C: Calendar-Time Regressions using Alternative Return Benchmarks

	All Issuers		*Recapitalisations*		*General Corporate Purposes*		*Investment*		*High-Quality Underwriters*		*Low-Quality Underwriters*	
	L-CAPM	*FF5FM*	*L-CAPM*	*FF5FM*	*L-CAPM*	*FF5FM*	*L-CAPM*	*FF5FM*	*L-CAPM*	*FF5FM*	*L-CAPM*	*FF5FM*
Alpha	−0.66%**	−0.64%***	−1.09%**	−0.86%*	−0.99%***	−0.91%***	0.05%	0.00%	−0.21%	−0.35%	−0.70%***	−0.68%***
p	(0.003)	(0.002)	(0.005)	(0.005)	(0.003)	(0.002)	(0.004)	(0.003)	(0.004)	(0.003)	(0.003)	(0.002)

Note: Panels A and B report Jensen's alpha estimates from the calendar-time models (4) and (5), which uses the Fama and French (1993) three-factor model (*FF3FM*), and the Carhart's (1997) four-factor model (*C4FM*) as the normal return benchmarks. Panel A reports results for SEOs split by the intended use of proceeds. Column *All Issuers* shows estimates for the pooled sample. Subsequent columns report results for SEOs split by the intended use of proceeds: *General Corporate Purposes*, *Investment* and *Recapitalisation*. Panel B reports results for SEOs split by the underwriter quality. We use Proceeds Rank and the underwriter reputation ranking of Corwin and Schultz (2005) with a threshold of 1.64 to split SEOs into High-Quality and Low-Quality underwriter groups. The sample size in Panel B The sample is 1,546 issues with non-missing information on the lead underwriter. Panel C presents Jensen's alpha estimates from calendar-time regressions where we use Liu's (2006) liquidity-augmented CAPM (*L-CAPM*) and the Fama and French (2015) five-factor model (*FF5FM*) as normal return benchmarks. *LIQ* is the difference between the return on a low liquidity portfolio and the return on a high liquidity portfolio constructed as in Liu (2006). *INV* and *PROF* are portfolios of stocks with conservative minus aggressive investment and robust minus weak profitability, respectively, constructed as in Fama and French (2015). *p* are p-values based on heteroskedasticity-consistent standard errors. *, ** and *** designate significance at the 10%, 5% and 1% level, respectively.

Table 4

Descriptive Statistics for Variables in the Regression Model

	Mean	*Median*	*Standard Deviation*
Investment	0.331	0.000	0.471
GCP	0.522	1.000	0.500
UnderwriterQ	0.104	0.000	0.306
Size	485.4	29.320	3,517
BM	0.611	0.440	0.894
INV/A	0.113	0.010	0.353
Age	10.79	6.000	11.45
Leverage	0.513	0.517	0.332
ROA	−0.162	0.000	0.429
Liquidity	20.93	1.000	41.32
Momentum	0.238	0.063	0.968
Proceeds	67.96	10.250	232.0
Placements	0.454	0.000	0.498
Rights	0.189	0.000	0.391

Note: The table reports descriptive statistics for explanatory variables in equation (6). *Investment* is a dummy variable that takes a value of one if companies state investment purposes for the equity issue and zero otherwise. *GCP* is a dummy variable that takes a value of one if companies state general corporate purposes and zero otherwise. The dummy variable *UnderwriterQ* takes the value of one if the lead underwriter of the SEO is a high-quality underwriter, and zero otherwise. *Size* is the firm's market value. *BM* is the book-to-market ratio. *INV/A* is Lyandres et al.'s (2008) investment-to-assets ratio. *Age* is the difference between the firms' first listing date and the issue date. *Leverage* is the ratio of total liabilities to total assets. *ROA* is return on assets and *Liquidity* is the Liu's (2006) stock liquidity measure *LM*12. *Momentum* is the stock's BHAR over six months before the issue and captures the pre-issue price run-up. *Proceeds* are issue proceeds. The dummy variables *Placements* and *Rights* refer to issue placements and rights issues, respectively. The variables are for the fiscal year-end prior to the offerings. The number of observations is 1,092 offerings.

Table 5

Regressions Analysis – Long-Run Post-Issue Performance

	Model (1)	*Model* (2)	*Model* (3)
Investment	0.501***	0.510***	0.540***
	(0.128)	(0.126)	(0.170)
GCP	0.434***	0.443***	0.421***
	(0.115)	(0.114)	(0.142)
UnderwriterQ	0.238**	0.232**	0.185*
	(0.100)	(0.099)	(0.107)
Placements		0.021	−0.103
		(0.084)	(0.099)
Rights		0.136	0.010
		(0.116)	(0.126)
ln(Size)			−0.004
			(0.049)
ln(Age)			−0.072
			(0.047)
BM			−0.020
			(0.076)
Leverage			0.274
			(0.187)
ROA			0.293**
			(0.134)
Liquidity			−0.003**
			(0.001)
Momentum			−0.033
			(0.038)
ln(Proceeds)			−0.005
			(0.039)
INV/A			−0.087
			(0.104)
Intercept	−0.360**	−0.442**	−0.308
	(0.173)	(0.191)	(0.236)
Year FE	Yes	Yes	Yes
Industry FE	Yes	Yes	Yes
N	1,546	1,546	1,092
Adjusted-R^2	0.030	0.030	0.029

Note: The table presents results for equation (6) where the dependent variable is the three-year Buy-and-Hold Abnormal Return ($BHAR_{months\ 1\text{-}36}$) for SEOs compared to size and book-to-market matched non-issuing stocks. The other variables are defined in Table 4. *t*-statistics reported in parentheses are based on standard errors adjusted for heteroskedasticity and year and firm clustering. *N* denotes the number of observations. *, ** and *** denote statistical significance at the 10%, 5% and 1% level, respectively.

Table 6

Price Reactions to Equity Issue Announcements

	N	CAR(0,1)	CAR (0,2)	CAR (−1,1)	CAR (−2,2)
Panel A: Intended use of the issue proceeds					
Recapitalisation	247	−1.90%	−2.23%	−2.30%	−2.56%
Z-test		(−1.580)*	(−1.477)*	(−1.791)**	(−1.552)*
Patell test		[−1900.5]**	[−2281.5]**	[−2424.5]**	[−2821.5]***
General Corporate Purposes	873	−0.07%	0.08%	0.02%	0.08%
Z-test		(−0.667)	(−0.063)	(−0.627)	(−0.347)
Patell test		[−7615]	[−7513]	[−9199]	[−10677]*
Investment	558	1.87%	2.15%	2.08%	2.66%
Z-test		(3.407)***	(3.600)***	(3.333)***	(3.586)***
Patell test		[10073.5]***	[9121.50]***	[7954.50]**	[7600.50]**
Panel B: Underwriter Quality					
High-Quality Underwriters	144	−0.02%	0.17%	0.07%	0.32%
Z-test		(0.871)	(1.373)*	(0.568)	(0.784)
Patell test		[22.5]	[344.5]	[172.5]	[304.5]
Low-Quality Underwriters	1402	−0.10%	0.00%	−0.06%	0.06%
Z-test		(0.183)	(0.894)	(0.233)	(0.923)
Patell test		[−2684.5]	[−7503.5]	[−13641]	[−18010]

Note: The table presents cumulative, market-adjusted abnormal returns (CARs) around the equity issue announcement date split by the intended use of the issue proceeds (Panel A) and by underwriter quality (Panel B). In curve brackets, we report the Boehmer et al. (1991) standardized cross-sectional Z-test, which is an extension of the traditional Patell test that compensates for a possible variance increase on an event date. In square brackets, we report the *W*-statistic for the non-parametric Wilcoxon signed-rank test.

Table 7

Regressions Analysis - Price Reactions to Equity Issue Announcements

	Model (1)	*Model* (2)	*Model* (3)
Investment	0.036***	0.035***	0.042***
	(0.012)	(0.012)	(0.013)
GCP	0.026**	0.024**	0.029**
	(0.012)	(0.012)	(0.012)
UnderwriterQ	0.004	0.005	0.001
	(0.009)	(0.009)	(0.010)
Placements		0.001	−0.007
		(0.008)	(0.010)
Rights		−0.023**	−0.026**
		(0.009)	(0.011)
ln(Size)			−0.001
			(0.003)
ln(Age)			−0.004
			(0.005)
BM			0.001
			(0.006)
Leverage			0.009
			(0.017)
ROA			0.009
			(0.015)
Liquidity			−0.000
			(0.000)
Momentum			0.002
			(0.006)
ln(Proceeds)			0.003
			(0.003)
INV/A			−0.001
			(0.011)
Intercept	−0.043***	−0.031*	−0.057**
	(0.015)	(0.016)	(0.025)
Year FE	Yes	Yes	Yes
Industry FE	Yes	Yes	Yes
N	1,546	1,546	1,092
Adjusted-R^2	0.026	0.030	0.046

Note: The table presents results for equation (7) where the dependent variable is the cumulative, market-adjusted abnormal return for a five-day window centred on the issue announcement date, CAR(−2, 2). The other variables are defined in Table 4. *t*-statistics reported in parentheses are based on standard errors adjusted for heteroskedasticity and year and firm clustering. *N* denotes the number of observations. *, ** and *** denote statistical significance at the 10%, 5% and 1% level, respectively.