Fundamental Analysis and the Valuation of IPOs in the Construction Industry

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Abstract: This study shows that: (1) In addition to past earnings, incomplete contracts disclosed in the prospectuses of construction firms’ IPOs is an important explanatory variable of earnings forecasts made by investment bankers. (2) Earnings forecasts can explain the offer prices set by investment bankers in the IPOs of construction firms. (3) Stock returns subsequent to the initial public offering are predictable on the basis of incomplete contract information available in the prospectuses. This last finding is robust to the inclusion of control variables for ex ante uncertainty, size, book-to-market, leverage, and earnings-to-price effects. The association between stock returns subsequent to the equity offering and incomplete contracts is consistent with both market inefficiency and the presence of risk factors for which investors expect greater underpricing of the IPO.

Recent research on residual income accounting has provided theoretical arguments and empirical support for the view that the book value of equity, as well as earnings, is a key determinant of company value (Ohlson, 1995; Barth et al., 1998; Collins et al., 1999). Other work has examined the ability of additional signals, beyond earnings and the book value of equity, to predict future earnings, and explain company value (Lev and Sougiannis, 1996; Abbaranell and Bushee, 1997; Myers, 1999).

One possible extension of the residual income approach is to incorporate additional determinants of company value which consider specific factors that influence firms in particular industrial sectors. This study explores one specific sector, construction, where one particular variable, incomplete contracts, is likely to be value relevant.

This study investigates the ability of incomplete contracts information to explain the earnings forecasts associated with the IPOs of construction firms in the Athens Stock Exchange (ASE). In addition, this study examines the ability of such information to explain the offer price of the IPO and the stock returns subsequent to the IPO.
Specifically, this study examines three main questions about the fundamental signals: book value of equity, earnings, and incomplete contracts. First, are the earnings forecasts significantly influenced by the fundamental signals: book value of equity, past earnings, and incomplete contracts? The prediction of future earnings is an important aspect of fundamental analysis that was highlighted by Penman (1992), while Penman (1996) investigates the ability of the book value of equity and past earnings to predict future earnings.

Second, with respect to the determination of the offer price, are earnings forecasts sufficient, or do book values of equity and incomplete contracts contain information over and above earnings forecasts which is also relevant for determining the offer price?

Finally, the study examines the relevance of incomplete contracts in explaining the stock returns beyond the launch of the IPO once controls for changes in earnings, the level of earnings, and variables that proxy for risk premiums have been established. The changes in earnings and the level of earnings, which were originally used by Easton and Harris (1991), can be interpreted as testing the relative informativeness of earnings and book values in explaining stock returns (Penman, 1996). The control variables that proxy for risk premiums and possible underpricing of the IPOs are along the lines suggested by Beatty and Ritter (1986) and Fama and French (1992).

The tests for the association between incomplete contracts and stock returns subsequent to the IPO allow the researcher to assess the informational efficiency of the stock market with respect to this fundamental item of information. Moreover, this study demonstrates that research on financial statement analysis can benefit from exploiting the additional information, such as incomplete contracts, which is published in the IPO prospectuses, but it is not published routinely after the IPO.

The empirical findings of the study reveal that the earnings forecasts provided by investment bankers in the prospectuses of initial public offerings are positively associated with the fundamental signals: earnings prior to the public offering and incomplete contracts at the moment of the public offering. Furthermore, the offer prices of IPOs are positively associated with the earnings forecasts, while the incomplete contracts and the book values of equity do not provide incremental explanatory power in explaining offer prices. The study also shows a strong positive association between stock returns subsequent to initial public offerings and incomplete contracts, which is present even after controlling for other possible omitted variables. This significant association between stock returns subsequent to the public offering and incomplete contracts is consistent with inefficient utilization of the incomplete contracts information by both the investment bankers, who set the offer prices of the construction firms, and the stock market. Alternatively, incomplete contracts may reflect extra risk factors for which investors expect greater underpricing of the IPO. The cyclical nature of the construction industry represents one such risk factor.

The remainder of this study is structured as follows: The next section describes the institutional framework prevailing in Greece over the study period. This is followed by a description of the data. The remaining sections present empirical findings on the use of fundamental signals for the estimation of earnings forecasts, the determination of offer prices and the explanation of stock returns subsequent to the equity offering. The last section of the study presents the conclusions.
THE INSTITUTIONAL FRAMEWORK

Presidential Decree No. 348 of 1985 and the Board of Directors of the ASE lays down the information that must be included in the prospectus of an initial public offering. The prospectus of a new public offering usually contains information about the following items.

1. The individuals responsible for providing the information in the prospectus
   - The names of the chief executive officer and the chief financial officer.
   - The names of the underwriter’s employees responsible for the offering.
   - The name of the auditor.
   - Statements of all the above individuals assuring the new stockholders that the information in the prospectus is consistent with reality and that there are no omissions.

2. A description of the shares that will be offered
   - The number and the face value of the shares.
   - The rights of the shares.
   - The offer price, the total proceeds, and a budget based on the proceeds.
   - The underwriter’s charges.
   - The number of shares that will be placed privately.

3. The business entity and its capital
   - Information from the charter of incorporation.
   - The amount of the contributed capital.
   - The types of shares and the rights of each type.
   - Changes in the contributed capital for the last 3 years.
   - Major stockholders and their percentages of ownership.

4. The activities of the issuing entity
   - The major activities of the issuing corporation.
   - A geographical analysis of sales.
   - The location and the importance of the different productive facilities.
   - The investment policy.
   - The financing policy.
   - The research and development activities.
   - The number of employees and the type of employment.
   - Any extraordinary events and pending litigation.

5. The financial position of the issuing entity
   - The financial statements of the issuer for the last 3 years.
   - Consolidated financial statements for the last 3 years.
● The earnings per share (EPS) for the last 3 years.
● The dividends per share for the last 3 years.
● Financial statements for the first 6 months of the current fiscal year.
● Investments in other entities that exceed 10 percent of the investee’s capital.

6. The management of the issuing entity

● The names, addresses, education, and criminal record of top executives and members of the board of directors.
● The number of shares of the entity that the members of the board of directors own.
● The compensation arrangements of the top executives and the members of the board of directors.
● The duties of the board of directors.
● Any related-party transactions.

7. Recent developments and prospects of the issuing entity

● Recent developments since the issuance of the last financial statements on production, sales, inventories, costs, and sales prices.
● The prospects of the issuing company at least for the current fiscal year.

The last part of the prospectus usually contains the earnings forecasts for the year of the public offering and, in rare instances, for the subsequent year. The Board of Directors of the ASE requires that the earnings forecasts of construction firms must be based only on the contracts that have been signed at the date of the public offering.

The last part of the prospectus also provides information on the amount of incomplete contracts. This amount is presented both for contracts that the company has undertaken alone and for contracts that the company has undertaken in cooperation with other construction companies. The ASE has also requested, in recent public offerings of construction firms, that the firms present a detailed list of: all the contracts that they have signed, the percentage that has been completed, the revenues that have been recognized, the profits that have been earned, participation in the ownership of the completed project, and the percentage of that ownership.

THE SAMPLE

The sample includes all firms in the construction sector of the ASE with the exemption of BIOTER. BIOTER was not included as it went public before 1985 and did not have to file a prospectus with the ASE. A prospectus was required for all public offerings after the year 1985 when the Presidential Decree 350/1985 was effective. The prospectus contains not only financial information for the year before the public offering, year \( t-1 \), but also information for the year of the public offering, year \( t \).\(^1\) Financial information for the measurement of the fundamental signals was hand-collected from the prospectus and the publicly available financial statements. Stock returns were estimated from stock...
prices adjusted for stock splits and stock dividends and stock prices were retrieved from the ASE database.

Panel A of Table 1 shows the frequency of new issues over time, with the largest number of issues taking place in 1994. Around that time, a large inflow of capital was expected from the European Union to finance new major public works in Greece and the small private construction firms had to increase their capital base to be able to participate

Table 1. Summary Statistics

| Panel A: Frequency of new issues |
| Year | Number of issues |
| 1990 | 1 |
| 1991 | 0 |
| 1992 | 0 |
| 1993 | 4 |
| 1994 | 19 |
| 1995 | 3 |
| 1996 | 2 |
| 1997 | 1 |
| Total | 30 |

Panel B: Characteristics of IPOs

<table>
<thead>
<tr>
<th>Variables</th>
<th>Mean</th>
<th>Median</th>
<th>Standard deviation</th>
</tr>
</thead>
<tbody>
<tr>
<td>Gross proceeds (in millions of GRD)</td>
<td>4,316</td>
<td>1,538</td>
<td>10,566</td>
</tr>
<tr>
<td>Market value (in millions of GRD)</td>
<td>8,647</td>
<td>6,813</td>
<td>5,805</td>
</tr>
<tr>
<td>Offer Price</td>
<td>1,932</td>
<td>1,800</td>
<td>742</td>
</tr>
<tr>
<td>1-week return&lt;sup&gt;a&lt;/sup&gt;</td>
<td>0.3197***</td>
<td>0.3767</td>
<td>0.3165</td>
</tr>
<tr>
<td>1-month return</td>
<td>0.8352***</td>
<td>0.4799</td>
<td>1.0581</td>
</tr>
<tr>
<td>3-month return</td>
<td>0.5972***</td>
<td>0.3433</td>
<td>0.7419</td>
</tr>
<tr>
<td>6-month return</td>
<td>0.5011***</td>
<td>0.3211</td>
<td>0.5471</td>
</tr>
<tr>
<td>12-month return</td>
<td>0.5571***</td>
<td>0.3000</td>
<td>0.7634</td>
</tr>
<tr>
<td>24-month return</td>
<td>0.5105***</td>
<td>0.2249</td>
<td>0.7990</td>
</tr>
<tr>
<td>EPS&lt;sub&gt;t-1&lt;/sub&gt; = (Reported Earnings&lt;sub&gt;t-1&lt;/sub&gt;) / (Total Shares&lt;sub&gt;t-1&lt;/sub&gt;)&lt;sup&gt;b&lt;/sup&gt;</td>
<td>261.017***</td>
<td>243.548</td>
<td>91.962</td>
</tr>
<tr>
<td>BVPS&lt;sub&gt;t-1&lt;/sub&gt; = (Book Value&lt;sub&gt;t-1&lt;/sub&gt;) / (Total Shares&lt;sub&gt;t-1&lt;/sub&gt;)&lt;sup&gt;b&lt;/sup&gt;</td>
<td>551.38***</td>
<td>564.86</td>
<td>176.128</td>
</tr>
<tr>
<td>Incomplete Contracts&lt;sub&gt;t&lt;/sub&gt; (in millions of GRD)</td>
<td>12,215</td>
<td>10,209</td>
<td>11,494</td>
</tr>
<tr>
<td>ICPS&lt;sub&gt;t&lt;/sub&gt; = (Incomplete Contracts&lt;sub&gt;t&lt;/sub&gt;) / (Total Shares)&lt;sup&gt;b&lt;/sup&gt;</td>
<td>3,236.74***</td>
<td>2,402.27</td>
<td>4,018.61</td>
</tr>
<tr>
<td>FEPS&lt;sub&gt;t&lt;/sub&gt; = (Forecasted Earnings&lt;sub&gt;t&lt;/sub&gt;) / (Total Shares)&lt;sup&gt;b&lt;/sup&gt;</td>
<td>317.46***</td>
<td>300.66</td>
<td>114.26</td>
</tr>
<tr>
<td>EPS&lt;sub&gt;t&lt;/sub&gt; = (Reported Earnings&lt;sub&gt;t&lt;/sub&gt;) / (Total Shares)&lt;sup&gt;b&lt;/sup&gt;</td>
<td>322.62***</td>
<td>299.86</td>
<td>133.70</td>
</tr>
</tbody>
</table>

Notes:  
<sup>a</sup> We compute stock returns as follows: (P<sub>t</sub> − P<sub>offer</sub>) / P<sub>offer</sub> where P<sub>t</sub> is the market price of the stock at the end of the 5th, 25th, 75th, 150th, 300th, and 600th trading day for the respective measurement of the 1 week, 1, 3, 6, 12, and 24 months stock return.  
<sup>b</sup> Total Shares<sub>t</sub> represents the number of shares after the public offering.  
*** Significant at the 0.01 level of significance.
in major construction projects. The inflow of capital from the European Union also generated an environment of intense competition in the construction industry that narrowed the profit margins of the construction firms.

Panel B of Table 1 presents the characteristics of the firms in the sample. The mean (median) amount of gross proceeds raised from the public offering is GRD 4,316 (1,538) millions, while the mean (median) market value of the sample firms, estimated at offering prices, is GRD 8,647 (6,813) millions. This suggests that the old stockholders maintain at least 50 percent ownership interest after the IPO.

The mean (median) offer price is GRD 1,932 (1,800). The average raw stock returns, based on offer prices, over the intervals of 1 week, 1, 3, 6, 12, and 24 months are, respectively: 31.97, 83.52, 59.72, 50.11, 55.71, and 51.05 percent. The mean and the median stock returns reach the highest level at the end of the first month and there is a decline thereafter. Positive stock returns can be earned by investors who acquire shares even at the end of the first week.

The mean (median) EPS for the year before the public offering \( \text{EPS}_{t-1} \) is GRD 261.017 (243.548), the mean (median) book value per share for the year before the public offering \( \text{BVPS}_{t-1} \) is GRD 551.38 (564.86). The mean (median) amount of incomplete contracts and incomplete contracts per share \( \text{ICPS}_t \) are, respectively, GRD 12,215 (10,209) millions and GRD 3,236.74 (2,402.27). Information about incomplete contracts for the year of the public offering \( t \) and expected earnings for the year \( t \) \( \text{FEPS}_t \) become publicly available when the prospectus is published, i.e., in the weeks prior to the flotation. The mean (median) forecast of EPS of the year \( t \) \( \text{FEPS}_t \) is GRD 317.46 (300.66), while the mean (median) reported EPS of the year \( t \) \( \text{EPS}_t \) is GRD 322.62 (299.86) and the difference between the two, i.e., the forecast error, is not significantly different from zero. The EPS grow from the year prior to the year of the public offering at an average rate of 23.37 percent.2

Panel A of Table 2 presents the correlation matrix of the variables used to explain earnings forecasts and offer prices. In this panel, there is significant correlation of the variable \( \text{OFFER PRICE} \) with each of the variables \( \text{FEPS}_t \), \( \text{EPS}_{t-1} \), and \( \text{ICPS}_t \) as well as of the variable \( \text{FEPS}_t \) with the variables \( \text{EPS}_{t-1} \), \( \text{ICPS}_t \) and \( \text{BVPS}_{t-1} \), while the highest correlation (0.714) is observed between the variables \( \text{BVPS}_{t-1} \) and \( \text{EPS}_{t-1} \). The correlation between \( \text{FEPS}_t \) and \( \text{ICPS}_t \) is not unexpected as some of the incomplete contracts that were known to the investment bankers before the public offering were considered in the development of the earnings forecasts.

Panel B of Table 2 presents the correlation matrix of the variables used to explain stock returns subsequent to the IPOs. This panel shows particularly high correlation of the variable \( \text{FEMV}_t \) with the variables \( \Delta \text{FEMV}_t \), \( \ln(\text{MV}_t) \), and \( \text{EPS}_{t-1}/\text{Offer Price} \), as well as of the variable \( \ln(\text{MV}_t) \) with the variable \( \text{EPS}_{t-1}/\text{Offer Price} \), and of the variable \( \text{ICMV}_t \) with the variable \( \text{EPS}_{t-1}/\text{Offer Price} \). These findings suggest that the use of these variables in multiple regressions could generate collinearity.
while the fundamental signals are based on financial information, which is also included in the prospectus. All the variables are expressed on a per share basis and the following regression model is estimated:

\[
\text{FEPS}_t = a_0 + a_1 \text{BVPS}_{t-1} + a_2 \text{EPS}_{t-1} + a_3 \text{ICPS}_t + \varepsilon
\]

where FEPS\(_t\) is the forecasted earnings for the year \(t\); BVPS\(_{t-1}\) is the book value of equity at the end of year \(t-1\); EPS\(_{t-1}\) is the reported earnings for the year \(t-1\); ICPS\(_t\) is the incomplete contracts at year \(t\).

Table 3 presents empirical findings from the regression of forecasted earnings (FEPS\(_t\)) on the fundamental signals. The reported \(t\)-statistics for all regression models have been estimated using White’s (1980) heteroskedasticity-consistent covariance matrix. These findings reveal that the reported earnings for the year before the public offering (EPS\(_{t-1}\)) as well as the incomplete contracts for the year of the public offering (ICPS\(_t\)) are positively related to earnings forecasts (FEPS\(_t\)) at the 0.01 level of significance.
significance. The insignificant association between FEPS and BVPS is very likely due to the high correlation of BVPS with EPS which was presented in Table 2. The findings from model (1) are consistent with the theoretical expectation (Penman, 1996) that past earnings can predict future earnings, as well as the fact that incomplete contracts will be recognized by accounting in the future and they will affect future revenues and earnings.

The Use of Fundamental Signals in the Determination of Offer Prices

First, this study examines the use of earnings forecasts as a determinant of construction firms offer prices because there is extensive reference in the prospectus to the development of earnings forecasts as well as their use in earnings multiples for the valuation of IPOs. A positive association is expected between offer price and earnings forecasts which is investigated by estimating the following regression model:

\[ \text{Offer Price} = a_0 + a_1 \text{FEPS}_t + \varepsilon \]  

Table 3. Fundamental Signals and the Estimation of Earnings Forecasts \((n = 30)\)

<table>
<thead>
<tr>
<th>(\alpha_0)</th>
<th>(\alpha_1)</th>
<th>(\alpha_2)</th>
<th>(\alpha_3)</th>
<th>Adjusted (R^2)</th>
<th>F-statistics</th>
</tr>
</thead>
<tbody>
<tr>
<td>Predictions</td>
<td>+</td>
<td>+</td>
<td>+</td>
<td>0.602</td>
<td>15.62***</td>
</tr>
<tr>
<td>67.387</td>
<td>0.085</td>
<td>0.604</td>
<td>0.013</td>
<td></td>
<td></td>
</tr>
<tr>
<td>(1.69)*</td>
<td>(0.78)</td>
<td>(2.89)***</td>
<td>(4.48)***</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Notes: Definition of the variables: FEPS\(_t\): (Forecasted Earnings\(_t\)) / (Total Shares\(_t\)). BVPS\(_{t-1}\): (Book Value\(_{t-1}\)) / (Total Shares\(_{t-1}\)). EPS\(_{t-1}\): (Reported Earnings\(_{t-1}\)) / (Total Shares\(_{t-1}\)). ICPS\(_t\): (Incomplete Contracts\(_t\)) / (Total Shares\(_t\)).

* Numbers within parentheses indicate t-statistics.

*** Significant at the 0.01 level of significance.

Furthermore, the study augments regression (2) by introducing the book values of equity (BVPS\(_{t-1}\)) and incomplete contracts (ICPS\(_t\)) to examine their incremental explanatory power over FEPS\(_t\) in explaining offer prices. Book values of equity, along with earnings, have often been used in models of equity valuation (see, for example, Feltham and Ohlson, 1995; Ohlson, 1995; Klein, 1996; Penman, 1996; Barth et al., 1998) and are included in model (3) along with the earnings forecasts. Incomplete contracts represent a case of unrecognized net assets, which have been considered determinants of equity values (Barth et al., 1998), and are introduced in regression (3). Sougiannis (1994) and Lev and Sougiannis (1996) have used R&D, which are also unrecognized assets in the Barth et al. sense, to explain market values.

The association between offer prices and the fundamental signals, FEPS\(_t\), BVPS\(_{t-1}\) and ICPS\(_t\) is investigated using the following regression model:

\[ \text{Offer Price} = a_0 + a_1 \text{FEPS}_t + a_2 \text{BVPS}_{t-1} + a_3 \text{ICPS}_t + \varepsilon \]
where FEPS\(_t\) is the forecasted earnings for the year \(t\); BVPS\(_{t-1}\) is the book value of equity at the end of year \(t-1\); ICPS\(_t\) is the incomplete contracts at year \(t\).

Assuming that incomplete contracts represent value relevant unrecognized net assets (Barth et al., 1998), \(a_3\) is expected to be positive, while \(a_1\) and \(a_2\) will also be positive as suggested by Ohlson (1995).

Panel A of Table 4 presents empirical findings from the estimation of the regression model (2). The primary finding from Panel A is the significant positive association between offer prices and earnings forecasts (FEPS\(_t\)). This finding is consistent with the use of earnings forecasts in the determination of the offer price in initial public offerings of construction firms.

Panel B of Table 4 presents empirical findings from the estimation of the regression model (3). The findings reveal a significant positive association only between earnings forecasts (FEPS\(_t\)) and offer prices. The other two variables BVPS\(_{t-1}\) and ICPS\(_t\) are not significant. Moreover, the \(F\)-statistic (0.11), examining the incremental explanatory power of BVPS\(_{t-1}\) and ICPS\(_t\) over FEPS\(_t\) in explaining offer prices, is not significant, suggesting that BVPS\(_{t-1}\) and ICPS\(_t\) do not provide offer price relevant information when FEPS\(_t\) has already been considered. This finding also reflects the significant association of earnings forecasts (FEPS\(_t\)) with both incomplete contracts (ICPS\(_t\)) and reported earnings (EPS\(_{t-1}\)), which was presented both in Tables 3 and 2.\(^3\)\(^4\)

### The Use of Fundamental Signals in Explaining Future Stock Returns

This section examines the ability of fundamental signals to explain stock returns subsequent to the initial public offering. The level of earnings, the change in earnings, the fundamental variables suggested by Fama and French (1992) and the level of incomplete contracts are used to explain stock returns subsequent to the initial public offering. The
Table 5. Fundamental Signals and Future Stock Returns (n = 30)

The regression model: \( SR_t = \alpha_0 + \alpha_1 \text{FEMV}_t + \alpha_2 \text{DFEMV}_t + \alpha_3 \ln(\text{MV}_t) + \alpha_4 \ln(\text{BV}_{t-}\text{Price}_t) + \alpha_5 \ln(\text{TA}_{t-}\text{BV}_{t-1}) + \alpha_6 \text{EPS}_{t-1}/\text{Price}_t + \alpha_7 \text{ICMV}_t \)

<table>
<thead>
<tr>
<th>Measurement period for stock returns</th>
<th>( \alpha_0 )</th>
<th>( \alpha_1 )</th>
<th>( \alpha_2 )</th>
<th>( \alpha_3 )</th>
<th>( \alpha_4 )</th>
<th>( \alpha_5 )</th>
<th>( \alpha_6 )</th>
<th>( \alpha_7 )</th>
<th>Adjusted ( R^2 )</th>
<th>F-statistics</th>
</tr>
</thead>
<tbody>
<tr>
<td>1 week</td>
<td>2.620</td>
<td>-2.467</td>
<td>1.472</td>
<td>-0.092</td>
<td>-0.330</td>
<td>1.098</td>
<td>0.001</td>
<td>-0.208</td>
<td>0.28</td>
<td></td>
</tr>
<tr>
<td></td>
<td>(0.51)</td>
<td>(-1.68)</td>
<td>(0.99)</td>
<td>(0.10)</td>
<td>(-1.86)</td>
<td>(-1.62)</td>
<td>(0.52)</td>
<td>(0.24)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>1 month</td>
<td>8.655</td>
<td>-5.865</td>
<td>4.794</td>
<td>-0.625</td>
<td>0.275</td>
<td>-1.155</td>
<td>-4.326</td>
<td>0.079</td>
<td>0.103</td>
<td>1.47</td>
</tr>
<tr>
<td></td>
<td>(0.83)</td>
<td>(-1.02)</td>
<td>(0.97)</td>
<td>(-0.91)</td>
<td>(0.72)</td>
<td>(-1.93)</td>
<td>(-1.02)</td>
<td>(3.37)***</td>
<td></td>
<td></td>
</tr>
<tr>
<td>3 months</td>
<td>-2.123</td>
<td>-0.888</td>
<td>2.871</td>
<td>0.013</td>
<td>0.079</td>
<td>-0.361</td>
<td>-0.111</td>
<td>0.079</td>
<td>0.580</td>
<td>6.73***</td>
</tr>
<tr>
<td></td>
<td>(-0.53)</td>
<td>(-0.20)</td>
<td>(0.80)</td>
<td>(0.04)</td>
<td>(0.42)</td>
<td>(-1.06)</td>
<td>(-0.04)</td>
<td>(4.10)***</td>
<td></td>
<td></td>
</tr>
<tr>
<td>6 months</td>
<td>-0.593</td>
<td>2.069</td>
<td>1.854</td>
<td>0.100</td>
<td>-0.052</td>
<td>-0.186</td>
<td>-1.057</td>
<td>0.056</td>
<td>0.369</td>
<td>3.42**</td>
</tr>
<tr>
<td></td>
<td>(-0.11)</td>
<td>(0.76)</td>
<td>(0.76)</td>
<td>(0.36)</td>
<td>(-0.34)</td>
<td>(-0.79)</td>
<td>(-0.50)</td>
<td>(5.92)***</td>
<td></td>
<td></td>
</tr>
<tr>
<td>12 months</td>
<td>5.734</td>
<td>3.990</td>
<td>-0.440</td>
<td>0.205</td>
<td>-0.019</td>
<td>-0.171</td>
<td>-4.240</td>
<td>0.088</td>
<td>0.401</td>
<td>3.783***</td>
</tr>
<tr>
<td></td>
<td>(1.03)</td>
<td>(0.77)</td>
<td>(-0.09)</td>
<td>(-0.62)</td>
<td>(-1.0)</td>
<td>(-0.47)</td>
<td>(-1.53)</td>
<td>(6.31)***</td>
<td></td>
<td></td>
</tr>
<tr>
<td>24 months</td>
<td>6.258</td>
<td>-4.620</td>
<td>0.947</td>
<td>-0.537</td>
<td>0.218</td>
<td>1.223</td>
<td>0.257</td>
<td>0.010</td>
<td>0.341</td>
<td>2.775**</td>
</tr>
<tr>
<td></td>
<td>(0.82)</td>
<td>(-1.37)</td>
<td>(0.24)</td>
<td>(-1.45)</td>
<td>(1.19)</td>
<td>(1.79)</td>
<td>(0.10)</td>
<td>(0.62)</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Notes: Definition of the variables: SR: \((P_{t-}\text{Offer Price}_t)/\text{Offer Price}_t\), FEMV: \((\text{Forecasted Earnings}_t)/\text{Offer Price}_t \times \text{Total Shares}_t\), \Delta \text{FEMV}: \((\text{Forecasted Earnings}_t - \text{Reported Earnings}_t)/\text{Offer Price}_t \times \text{Total Shares}_t\). MV: The market value of the firm at offer prices, i.e., \text{Offer Price}_t \times \text{Total Shares}_t. BV: The book-value of equity, i.e., financial leverage based on book values. \text{EPS}_t/\text{Price}_t: The earnings-to-price ratio. All firms in the sample have a net profit. ICMV: Incomplete Contracts/Total Shares.*Offer Price.

\(^a\) The expectation is that each coefficient will be insignificant if efficient pricing occurs.

\(^b\) Numbers within parentheses indicate \(t\)-statistics.

\(*\) Significant at the 0.10 level of significance.

\(**\) Significant at the 0.05 level of significance.

\(***\) Significant at the 0.01 level of significance.
level of earnings and the change in earnings were originally proposed by Easton and Harris (1991) and can be interpreted as testing the relative informativeness of book values and earnings, respectively, in explaining stock returns. The fundamental variables suggested by Fama and French (1992) are: firm size (market capitalization), the book-to-market ratio, financial leverage, and the earnings-to-price ratio. The effect of including these independent variables in the regression is to control for risk and possible mispricing associated with the book-to-market or the earnings-to-price ratios. The level of incomplete contracts is also included as an explanatory variable because it provides information that will be recognized by the accounting system in future periods. The change in incomplete contracts is not included, as it cannot be estimated; there is publicly available information for the amount of incomplete contracts only in the year of the public offering. Hence, for the estimation of the association between fundamental signals and subsequent stock returns, the following regression model is estimated:

\[
SR_t = a_0 + a_1 FEMV_t + a_2 \Delta FEMV_t + a_3 \ln MV_t + a_4 \ln (BV_{t-1} / MV_t) \\
+ a_5 (TA_{t-1} / BV_{t-1}) + a_6 (EPS_{t-1} / Offer Price) + a_7 ICMV_t + \epsilon
\]

where \( SR_t \) is the \((P_t - Offer Price) / Offer Price; FEMV_t \) is the Forecasted Earnings_t / Total Shares * Offer Price; \( \Delta FEMV_t \) is (Forecasted Earnings_t - Reported Earnings_t-1) / Total Shares * Offer Price; \( MV_t \) is the the market value of the firm at offer prices, i.e., Offer Price * Total Shares; \( BV_{t-1} / MV_t \) is the Book-to-Market ratio; \( TA_{t-1} / BV_{t-1} \) is the Total Assets to Book Value of equity ratio, i.e., financial leverage based on book values; \( EPS_{t-1} / Offer Price \) is the Earnings-to-Price ratio; \( ICMV_t \) is the Incomplete Contracts_t / Total Shares * Offer Price.

Assuming efficient pricing by both the investment bankers and the stock market the expectation is that each of the coefficient \( a_1, a_2, a_3, a_4, a_5, a_6, \) and \( a_7 \) will be equal to zero.

Table 5 presents empirical findings for the regression model (8), when the dependent variable is measured over the intervals of 1 week, 1 month, 6 months, 1 year, and 2 years. There is a significant positive association only between incomplete contracts and stock returns, when the stock returns are measured over the intervals of 1, 3, 6, and 12 months subsequent to the IPO.5 The magnitude of the condition index (222) for the regression models of Table 5 and the evidence from Panel B of Table 3 are consistent with the presence of collinearity among the independent variables of model (8) (see for example, Belsley et al., 1980). The significant association between incomplete contracts and stock returns, even in the presence of other control variables, suggests that there may be a mispricing of construction firms’ securities. Alternatively, stock returns may reflect an extra-market risk factor associated with incomplete contracts. This risk factor could be capturing the cyclical nature of the construction industry.

Next, the study examines the efficiency of the stock market by measuring stock returns on the basis of the first day closing market price, i.e.,

\[
SR_t = (P_t - First Day Closing Price) / First Day Closing Price.
\]

Empirical findings for the regression model (8) with the new measure of stock returns are presented in Table 6. These findings show that ICPS_t is still a significant explanatory variable of stock returns, evidence consistent with market inefficiency.
Table 6. Fundamental Signals and Future Stock Returns \((n = 30)\)

The regression model: \(SR_t = \alpha_0 + \alpha_1 FEMV_t + \alpha_2 \Delta FEMV_t + \alpha_3 \ln(MV_t) + \alpha_4 \ln(BV_{t-1}/MV_t) + \alpha_5 \ln(TA_{t-1}/BV_{t-1}) + \alpha_6 EPS_{t-1}/First\ Day\ Closing\ Price + \alpha_7 ICMV_t\).

<table>
<thead>
<tr>
<th>Measurement period for stock returns</th>
<th>(\alpha_0)</th>
<th>(\alpha_1)</th>
<th>(\alpha_2)</th>
<th>(\alpha_3)</th>
<th>(\alpha_4)</th>
<th>(\alpha_5)</th>
<th>(\alpha_6)</th>
<th>(\alpha_7)</th>
<th>Adjusted (R^2)</th>
<th>F-statistics</th>
</tr>
</thead>
<tbody>
<tr>
<td>1 week</td>
<td>1.884</td>
<td>0.248</td>
<td>-0.299</td>
<td>-0.110</td>
<td>0.036</td>
<td>-0.292</td>
<td>-1.161</td>
<td>0.013</td>
<td>0.008</td>
<td>1.03</td>
</tr>
<tr>
<td></td>
<td>(0.98)(^p)</td>
<td>(0.04)</td>
<td>(-0.05)</td>
<td>(-1.13)</td>
<td>(0.62)</td>
<td>(-1.87)(^*)</td>
<td>(-0.30)</td>
<td>(1.39)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>1 month</td>
<td>2.007</td>
<td>22.132</td>
<td>-20.997</td>
<td>-0.642</td>
<td>0.501</td>
<td>-1.181</td>
<td>-24.268</td>
<td>0.091</td>
<td>0.220</td>
<td>2.17(^*)</td>
</tr>
<tr>
<td></td>
<td>(0.22)</td>
<td>(0.91)</td>
<td>(-0.87)</td>
<td>(-1.38)</td>
<td>(1.80)</td>
<td>(-1.57)</td>
<td>(-1.33)</td>
<td>(1.97)(^*)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>3 months</td>
<td>-1.693</td>
<td>19.668</td>
<td>-18.165</td>
<td>-0.282</td>
<td>0.301</td>
<td>-0.385</td>
<td>-17.355</td>
<td>0.068</td>
<td>0.545</td>
<td>5.97(^***)</td>
</tr>
<tr>
<td></td>
<td>(-0.31)</td>
<td>(1.39)</td>
<td>(-1.29)</td>
<td>(-1.04)</td>
<td>(1.85)(^*)</td>
<td>(-0.88)</td>
<td>(-1.63)</td>
<td>(2.531)(^**)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>6 months</td>
<td>2.410</td>
<td>4.002</td>
<td>-2.005</td>
<td>-0.122</td>
<td>0.033</td>
<td>-0.365</td>
<td>-5.279</td>
<td>0.036</td>
<td>0.449</td>
<td>4.38(^***)</td>
</tr>
<tr>
<td></td>
<td>(0.63)</td>
<td>(0.40)</td>
<td>(-0.20)</td>
<td>(-0.63)</td>
<td>(0.28)</td>
<td>(-1.17)</td>
<td>(-0.69)</td>
<td>(1.88)(^*)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>12 months</td>
<td>10.573</td>
<td>0.610</td>
<td>0.586</td>
<td>-0.489</td>
<td>0.056</td>
<td>-0.379</td>
<td>-5.678</td>
<td>0.072</td>
<td>0.390</td>
<td>3.65(^***)</td>
</tr>
<tr>
<td></td>
<td>(1.80)(^*)</td>
<td>(0.03)</td>
<td>(0.03)</td>
<td>(-1.63)</td>
<td>(0.31)</td>
<td>(-0.78)</td>
<td>(-0.48)</td>
<td>(2.40)(^**)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>24 months</td>
<td>1.647</td>
<td>5.594</td>
<td>-6.826</td>
<td>-0.543</td>
<td>0.386</td>
<td>0.538</td>
<td>-7.318</td>
<td>0.056</td>
<td>0.063</td>
<td>1.24</td>
</tr>
<tr>
<td></td>
<td>(0.17)</td>
<td>(0.20)</td>
<td>(-0.24)</td>
<td>(-1.26)</td>
<td>(1.43)</td>
<td>(0.64)</td>
<td>(-0.36)</td>
<td>(1.33)</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Notes: Definition of the variables: \(SR_t\): \((P_t - First\ Day\ Closing\ Price)/First\ Day\ Closing\ Price\). \(FEMV_t\): \((\text{Forecasted Earnings}_t)/(First\ Day\ Closing\ Price \times \text{Total\ Shares})\). \(\Delta FEMV_t\): \((\text{Forecasted Earnings}_t - \text{Reported\ Earnings}_{t-1})/(First\ Day\ Closing\ Price \times \text{Total\ Shares})\). \(MV_t\): The market value of the firm at First Day Closing Prices, i.e., \((\text{First\ Day\ Closing\ Price}) \times \text{Total\ Shares}\). \(BV_{t-1}/MV_t\): The book-to-market ratio. \(TA_{t-1}/BV_{t-1}\): The total assets to book value of equity ratio, i.e., financial leverage based on book values. \(EPS_{t-1}/First\ Day\ Price\): The earnings-to-price ratio.

All firms in the sample have a net profit. \(ICMV_t\): Incomplete Contracts/Total Shares/First Day Closing Price.

* The expectation is that each coefficient will be insignificant if efficient pricing occurs.

\(^p\) Numbers within parentheses indicate \(t\)-statistics.

\(^*\) Significant at the 0.10 level of significance.

\(^*\) Significant at the 0.05 level of significance.

\(^***\) Significant at the 0.01 level of significance.
CONCLUSIONS

This study shows that earnings forecasts provided by investment bankers in the prospectuses of construction firms’ IPOs are positively associated with earnings of the year prior to the public offering and with incomplete contracts, i.e., unrecognized revenue, at the moment of the public offering. The study also shows that offer prices are positively associated with earnings forecasts. Earnings forecasts, though, are associated with the incomplete contracts and earnings of the year prior to the IPO. Hence, not only earnings forecasts but also incomplete contracts and past earnings provide value relevant information.

The study also provides empirical findings showing a significant positive association between stock returns subsequent to initial equity offerings and incomplete contracts. This association holds even when there are controls for ex ante uncertainty, size, leverage, earnings-to-price, and book-to-market ratios. The significant association between stock returns subsequent to the initial public offering and incomplete contracts at the moment of the public offering suggests inefficient utilization of the incomplete contracts information by the investment bankers and the stock market. Alternatively, incomplete contracts may reflect an extra risk factor associated with ex ante uncertainty for which market participants expect greater underpricing. The cyclical nature of the construction industry represents one such risk factor.

The findings of this study also point out the relevance of future revenues that have not been recognized by the accounting system in security valuation. Hence, accounting regulators should consider requiring that construction companies regularly report in footnotes to the financial statements the incomplete contracts information as it happens in the case of reserve recognition accounting measures for oil and gas firms.

Acknowledgments: We wish to thank an anonymous referee and participants at the 1999 European Accounting Congress as well as at the Second Annual Conference on Contemporary Issues in Capital Markets organized by the University of Cyprus.

NOTES

1. The arguments presented in the article are based on the following time-line:

   ![Date of the Public Offering]

   Year | t-1 | t

   Year \( t \) is the year in which the public offering occurs and year \( t-1 \) is the year prior to the public offering. Financial statements are available only for the year \( t-1 \) at the date of the public offering.

2. Untabulated evidence on the time series behavior of unexpected accruals reveals the presence of significant positive unexpected accruals both in the year of the public offering and in the prior year. The unexpected accruals of the year after the public offering were not statistically different
from zero. This evidence is consistent with the presence of earnings management. The estimation of accruals was based on DeAngelo (1986) and the modified Jones (1991) model that was proposed by Dechow et al. (1995).

3. The condition index for the regression model (3) is 9.94 and suggests the presence of collinearity among the independent variables of the model (see, for example, Belsley et al., 1980, p. 15).

4. The value relevance of fundamental signals was also examined by employing the comparable firms’ approach suggested by Kim and Ritter (1999). The comparable firms’ approach relies on multiples (e.g., price-to-earnings) of comparable firms as benchmarks for the valuation of IPOs. This approach is implemented empirically by estimating the following univariate models.

\[
\text{Offer Price} = a_0 + a_1 \left( \frac{P}{EPS_{t-1}} \right)_{\text{comparable}} + \varepsilon
\]  

(4)

\[
\text{Offer Price} = a_0 + a_1 \left( \frac{P}{FEPS_t} \right)_{\text{comparable}} + \varepsilon
\]  

(5)

\[
\text{Offer Price} = a_0 + a_1 \left( \frac{P}{BV_{t-1}} \right)_{\text{comparable}} + \varepsilon
\]  

(6)

\[
\text{Offer Price} = a_0 + a_1 \left( \frac{P}{\text{Incomplete Contracts}_{t}} \right)_{\text{comparable}} + \varepsilon
\]  

(7)

A comparable firm is selected for each firm involved in an initial public offering. The comparable firm is also from the construction industry but went public before the firm of immediate interest. This step implies that the first IPO in the construction industry did not have a comparable firm. We rely on one firm rather than taking the median of a number of firms because of the small number of firms in the construction industry (30). Furthermore, we select comparable firms from the same industry because Alford (1992) provides evidence that predictions of prices based on the \( P/E \) valuation method were more accurate when the comparable firms were selected from the same industry rather than on other dimensions such as: firm size or earnings growth. The stock price of the comparable firm is the closing price 1 day prior to the date of the public offering.

Untabulated findings for the regression models (4)–(7) reveal that only in model (5) the explanatory variable \( \frac{P}{FEPS_t} \) comes close to being statistically significant at the 0.10 level but the overall model is not significant. This finding is consistent with the evidence presented by Kim and Ritter (1999) and with the references made by investment bankers in the prospectuses to earnings forecasts for the valuation of the IPOs of this study.

5. Beatty and Ritter (1986) have proposed that the greater the ex ante uncertainty about the value of a new public offering the greater the expected underpricing. As ex ante uncertainty about the value of a public offering increases, an investor submitting purchase orders in IPOs will be more frequently allocated shares in offerings that decline in price than offerings that appreciate, i.e., the investor will be faced with the winner’s curse problem. Consequently, an informed investor submitting purchase orders in offerings with greater ex ante uncertainty will expect greater underpricing. Beatty and Ritter (1986) have tested the implications of their proposition by using the reciprocal of the gross proceeds as a surrogate for ex ante uncertainty and found a significant positive association between stock returns and gross proceeds. Untabulated evidence, based on the regression model (8) that has been expanded by adding the gross proceeds as an additional explanatory variable, shows that this new variable is not significant. Furthermore, we used the standard deviation of the residuals from the market model as surrogate for ex ante uncertainty. Market models were estimated for each firm over 250 daily returns following the public offering. Untabulated findings for the regression model (8) with the standard deviation of the market model residuals as an additional explanatory variable reveal that the new variable is significant in all estimated regressions. There is, however, a reduction in the significance level of
the incomplete contracts (ICPS), which is probably due to the high correlation (0.64) between these two variables. Beatty and Ritter (1986, Note 13, p. 222) mention this surrogate for ex ante uncertainty but do not use it as it would result in significant sample size reduction.

REFERENCES


