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Underpricing and distance: an empirical analysis

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Abstract

This paper tests the hypothesis that the distance of a firm from the main financial centre affects underpricing positively. The higher is the distance the higher are the information imperfections among players involved in the Initial Public Offering and the higher is the uncertainty about the true value of the listing firm. Econometric results show that, in the Italian case, more distant firms from the financial centre are more underpriced. This finding holds in France but not in Germany suggesting that probably it is due to the spatial organization of the financial system.

Key words: Underpricing, IPO, Distance

JEL Classification: G24, O16, O18

1. Introduction

The most extensively documented empirical regularity related to Initial Public Offerings (IPOs) is the underpricing: the shares of issuing companies are offered to investors at considerably lower prices than those they subsequently trade on the stock market. Jenkinson and Ljungqvist (2001) report evidence that underpricing is relevant in every country and on average it is more than 15% in countries with developed financial system and around 60% in emerging markets.

An important aspect of underpricing is that it can be thought as an indirect cost of raising equity finance.ⁱ The cost arises both in the case of primary equity offerings, via the dilution of the original shareholders' stakes in the company, and in the case of secondary equity offerings, because the original shareholders could have sold their shares at a higher price.

Several theories have been proposed to explain underpricing. In this work we empirically test the *ex-ante* uncertainty explanation proposed by Beatty and Ritter (1986) introducing a new proxy for the *ex-ante* uncertainty: the physical distance between issuing firms and the financial centre. We analyze the Italian case where we find a positive and significant relation between distance and underpricing. Therefore, the indirect cost of going public is greater for distant firms. Moreover, our results support the 'Certification Hypothesis' introduced by Booth and Smith (1986) and never tested on Italian case.

Probably, the positive effect of distance on underpricing is due to the geographically centralized structure of Italian financial system. Then, we check if the result is still true in France and Germany. The comparison is particularly interesting given the fact that France has a centralized financial system, similar to Italy, while Germany has a spatially decentralized financial system.ⁱⁱ Estimates show that positive relation between distance and underpricing holds in France but not in Germany.

2. Underpricing and Firms Localization

Beatty and Ritter (1986) argue that there is a monotone relation between expected underpricing of an Initial Public Offering and the uncertainty of investors regarding its value. This uncertainty, that they define *ex-ante* uncertainty, is a proxy of asymmetric information among players involved in the IPO process. The authors demonstrate their proposition using the asymmetric information model introduced by Rock (1986). They assume that investors are uncertain about the value of the firm and that the issuing firm cannot make a credible commitment about its value because of moral hazard problem. Instead, the issuing firm must hire an underwriter that has the key function of avoiding the moral hazard problem and certifying that the IPO price correctly reflects the value of the firm and the potentially adverse inside information. This is what Boot and Smith (1986) call 'Certification Hypothesis'. In this framework financial markets are not perfect and the presence of market imperfections are relevant. Klagge and Martin (2005) suggest that in a spatially centralized system with a single financial centre asymmetric information, costly information and uncertainty may be a function of the physical distance between firms seeking finance and institutions providing finance. Moreover, some authors have shown that institutional investors are more likely to buy and hold stocks of firms that are located closer to the investors because the cost of information acquisition decreases with geographic proximity (Coval and Moskowitz, 2001). Malloy (2005) gave evidence of the fact that geographically proximate analysts are more accurate than others. These findings suggest that informational asymmetries increase with distance. Then, the *ex-ante* uncertainty about the value of the firms that go public, that is a proxy of asymmetric information, increases with firm distance from underwriters and investors (in particular institutional investors). Given that such operators, in a spatially centralized financial system, are located in the financial centre, more distant firms from financial centre will be more underpriced.

3. Data, Model and Results

In our analysis we consider IPOs that took place in the Italian Stock Exchange between 1999 and 2009. Only firms listing on the equity market for the first time are included in the sample.ⁱⁱⁱ A total of 134 IPOs are considered.

The *Underpricing*, our dependent variable, is

$$U_i = \frac{(P_i - S_i)}{S_i} * 100$$

Where P_i is the closing price on the first day of trading and S_i is the subscription price.^{iv} Data to calculate *Underpricing* are those published by Borsa Italia SPA. Financial and other information about firms are those included in the IPO prospectus. Our proxy for *ex-ante* uncertainty is the variable *Distance* that measures the physical distance, in kilometers, between the legal headquarter of the firms and the city of Milano. The Italian financial centre is identified with the city of Milano where the only stock exchange, the headquarters of most important banks and almost all financial operators and institutional investors are located. We have also calculated the distance in terms of the necessary time to cover the physical distance.^v In the model we include many control variables that previous studies have proposed as proxies for *ex-ante* uncertainty in order to check the relationship with underpricing. Firm's size and age (variables *Size* and *Age*) have frequently been used to proxy investors' *ex-ante* uncertainty. The larger and the older the firm, the lower is the uncertainty about its true value. Both variables have been computed as the natural logarithm. *Reputation* is a dummy variable equal to one if the underwriter has a good reputation on capital market and to zero otherwise. A testable implication of the 'Certification Hypothesis' is that the better is underwriter reputation the lower is the *ex-ante* uncertainty about the IPO and consequently the underpricing. There are several proxies in empirical literature for underwriter reputation. We use a dummy variable based on Carter and Manaster's (1998) indicator. *Range* is a proxy for the uncertainty at the beginning of the IPO process and it is the price range from which the institutional investors express their interest in the issue. Many studies show that market sentiment affects the uncertainty

of IPOs. Then, we introduce the variables *Index Return* and *Index Volatility* in the model. *Index Return* is the percentage change in the Mib30 index in the twenty working days before the listing. If the market is bullish, investors are induced to upgrade their estimation on the value of a firm. *Index Volatility* is the standard deviation of the Mib30 index in the 60 working days before the listing. Volatility of the market increases the systematic risk and investor will be more careful in the evaluation of the IPO. Therefore, we expect a positive relation between market variables and underpricing. Both variables have been considered by Cassia *et al.* (2003) and the authors found a positive coefficient for the return of MIB 30 and a negative sign for the volatility of such index. The last proxy of *ex-ante* uncertainty that we add is *Greenshoe*, the ratio between the number of share dedicated to the greenshoe option and total number of share sold in the IPO. In order to support the share price during the first days of trading underwriters use the overallotment and greenshoe options in almost every Italian IPOs. Jenkinson and Jones (2007) point out that this procedure prevents a decline in price once stocks start trading and Benveniste and Spindt (1989) argue that greenshoe option reduces the risk of the issue, its uncertainty and the expected underpricing.

Finally, we add two variables related to the bookbuilding method used in Italy in almost all IPOs since 1994. *Revision* is the revision of the issue price relative to the average value of the range price. It measures the amount of information that the underwriter has gathered in the roadshow. Cornelli and Goldreich (2003) and Ljungqvist and Wilhelm (2002) use such variable and show that issues with positive revision in the offer price have greater underpricing.

Oversubscription is the ratio between the number of institutional investors that have requested the share and the number of institutional investors that get the share. If the demand for the share is large, many investors will try to buy the shares in the aftermarket and this will affect positively the level of underpricing.

The estimates of the factors that has determined underpricing in the period 1999-2009 are reported in Table 1.^{vi} Column 1 shows that all coefficients have the expected sign, with the exception of the

variable *Range*. We expect a positive correlation with *Underpricing* but the coefficient is negative. However, the coefficient is not statistically significant. This result is similar to what found in other works. A reason could be that the range price is established six months before the day of the listing and in this period the underwriter could receive enough information to change its initial evaluation. All other coefficients are significant. The dummy for the underwriter reputation is significant with a negative sign as suggested by the ‘Certification Hypothesis’. Our proxy for the *ex-ante* uncertainty, the variable *Distance*, is significant at 1% level and shows a positive sign. This result corroborates our hypothesis that more distant firms from the financial centre experience a higher underpricing and so a higher indirect floatation cost.

We also control our main result introducing sectorial dummy variables (*Service Sector* and *Financial Sector*) and the fees paid by the issuing firms to the underwriter (*Fees*) in the model. We use the Borsa Italia sectorial classification that allocates firms in industrial, service and financial sectors. Results are shown in column 2. The coefficients of sectorial dummies are significant with positive signs, meaning that the financial and service firms are more underpriced than industrial firms. The variable *Fees*, that is the direct cost of going public, has a positive correlation with *Underpricing*, excluding that high underpricing could be balanced by lower fees. Variable *Distance* is robust to these checks and it is still significant at 1% level.^{vii}

Finally, for international comparison, we estimate a restricted model for Germany and France.^{viii} In other countries, like Germany and France, the IPO process is partially different from the Italian case and many variables are not computable.^{ix} French financial centre is Paris and German is Frankfurt.^x Market Index are Cac40 for France and Dax30 for Germany. PIPOs and ECOs are excluded from the sample and only firms listing for the first time are considered. In order to compare the results we estimate the restricted model also for Italy (column 3). Econometric results do not change and the impact of *Distance* remains the same. The positive relationship between *Underpricing* and *Distance*

is still true in France (column 4) but not in Germany (column 5). This may be due to the geographically centralized structure of Italian and French financial system.

Table 1. Determinants of underpricing in Italy, France and Germany (1999-2009)

	1	2	3	4	5
<i>Distance</i>	0.019*** (0.006)	0.021*** (0.006)	0.021*** (0.008)	0.003*** (0.001)	0.013 (0.012)
<i>Revision</i>	6.75*** (2.42)	6.93*** (2.54)			
<i>Size</i>	-0.83** (0.34)	-0.52 (0.37)	-1.01*** (0.33)	0.36 (0.23)	-2.05** (0.91)
<i>Age</i>	-3.52** (1.47)	-2.44* (1.39)	-2.69* (1.45)	-0.22 (0.45)	-3.91** (1.79)
<i>Index Return</i>	0.92** (0.40)	1.04** (0.45)	1.15** (0.57)	0.19*** (0.08)	0.34 (0.46)
<i>Index Volatility</i>	0.016* (0.009)	0.016* (0.01)	0.015* (0.008)	0.02*** (0.006)	0.11*** (0.021)
<i>Reputation</i>	-6.63** (2.59)	-6.11** (2.67)			
<i>Greenshoe</i>	-0.72** (0.33)	-0.65** (0.31)			
<i>Oversubscription</i>	9.95* (5.99)	10.85* (5.85)			
<i>Range</i>	-0.34 (0.04)	-0.038 (0.045)			
<i>Service Sector</i>		5.07* (2.90)	3.79 (3.05)	-2.82*** (0.96)	7.18 (5.61)
<i>Financial Sector</i>		6.89** (2.80)	7.5** (3.38)	1.04 (1.55)	-9.75*** (4.05)
<i>Fees</i>		2.32* (1.31)			
<i>Constant</i>	14.11 (9.78)	1.62 (9.56)	11.73** (5.69)	-5.20 (4.01)	34.39** (16.49)
R^2	0.4656	0.5014	0.2755	0.0786	0.1606
F-statistic	12.36	12.56	2.8	3.78	7.03
Observations	134	124	134	332	308

Notes: Figures in parentheses are standard errors.
***, **, * Significant at 1%, 5% and 10%.

4. Conclusions

Our empirical analysis shows that in Italy the underpricing is greater for the firms localized far away from the financial centre. Since in literature underpricing is considered the main indirect flotation cost, our ‘Localization Hypothesis’ means that the cost of equity is greater for the distant firms. In Italy we also found empirical evidence of the ‘Certification Hypothesis’. This finding corroborates the theory that explains the underpricing in the context of asymmetric information and

ex-ante uncertainty. International comparison shows that positive relationship between underpricing and distance holds in France but not in Germany. This suggests that probably the result is due to the centralized structure of the Italian and French financial systems. Further studies would be needed to corroborate ours results.

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ⁱ IPO process involves both direct costs (underwriting and audit fees, selling commission, legal expenses, etc.) and indirect costs. Underpricing is considered the larger indirect cost.

ⁱⁱ Frankfurt is the main financial centre with the major stock exchange. Moreover there are several regional financial centres with their own stock exchange and large concentration of regional banks and other financial institutions.

ⁱⁱⁱ Privatization Initial Public Offerings (PIPOs) and Equity Curve Outs (ECOs) are excluded from the sample because they are less risky than independent IPOs. Pagano *et al.* (1998) identify a significant difference between the factors underlying the decision to go public taken by PIPOs, ECOs and independent firms. Also foreign firms are excluded (firms that not have their own legal headquarter in Italy).

^{iv} We also compute market adjusted underpricing as difference between underpricing and the change in the market index during the first day of trading. Estimates with market adjusted underpricing and raw underpricing are very similar.

^v The variable shows a high positive correlation with the variable *Distance* then we use only the last one. Moreover if we introduce in the model Regional Dummies their coefficients are not significant.

^{vi} OLS estimates are adjusted for heteroschedasticity using White (1980) covariance matrix.

^{vii} As further check we estimate a model in which regional variables (gdp, R&D expenditure, coefficients of sectorial specialization, etc.) are included as regressors. The results are not statistically significant.

^{viii} *Underpricing* and market variables are calculated using Nyse-Euronext and Deutsche Boerse Group official data. Information about firms are collected from IPO prospectus.

^{ix} While in Italy all IPOs are conducted with the bookbuilding procedure in Germany and France many IPOs have been floated using different methodologies (minimum price, fixed price. etc).

^x Taking into account that in Germany there are many regional stock exchanges we calculate the variable *Distance* in two different way: both from the main stock exchange (Frankfurt) and from the closer stock exchange to the listing firm. Econometric results not change regardless of what method we use.