

REGIONAL DISTRIBUTION OF IPOs AND GROWTH: AN EMPIRICAL ANALYSIS

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Abstract

This paper analyses if the proximity to financial centres affects costs and benefits to go public. First was tested, in the Italian case, the hypothesis that distance has a negative effect on the decision of a firm to go public. To this aim, we have compared firms which decided, during 1995-2004 period, to list to the Italian stock exchange with those not listed despite meeting the listing requirements. A probit model was estimated and econometric results show that distance of a firm from the main Italian financial centre of Milano, coeteris paribus, affects negatively the decision of the firm to go public.

Afterwards the paper analyses the relationship between distance from the financial centre of Milano and underpricing in the period 1995-2006. We used as control variables the usual ones (size, age, market volatility, underwriter reputation, etc). The OLS estimation shows a positive and significant effect of distance on underpricing. This result corroborates the hypothesis of a negative effect of distance on the IPO regional distribution.

In the end the analysis have been extended to three countries: Italy, France and UK. Our analysis have been limited to one but very significant sector, the ICT. This is a sector that in the past years registered a very high number of IPO and is characterized by an high number of high growth firm. The econometric estimation shows that the number of IPO per capita in ICT industry of a region is negatively correlated with distance of the chief town of the region from the main financial centre of the country and positively correlated with the degree of specialization in computer and related services industry.

Key words: growth, IPO, regions

JEL Classification :G24, O16, O18

1. Introduction

An old economic tradition dated back to the work of Schumpeter links the growth of the real economy to the development of financial markets. Recent economic literature has empirically analysed such relationship. Rajan and Zingales (1998) found a positive relationship between the degree of development of banking system and the rate of growth of PIL. Aghion *et al.* (2004) argue that the likelihood of converging to the US growth rate increases with financial development. Similarly the development of venture capital market has been found very important factor in the growth of innovative firms. Zook (2001) found that the regional distribution of venture capital investing played a central role in determining the location of new Internet start-up in USA. The contribution of the capital market to the growth of innovative firms has been very important (Storey 1993, Gompers and Lerner 2005). The US new business start-up and rapidly growing small business have largely compensate the loss of jobs in Large American Companies. Most of these new firms has grown so rapidly that three quarters of the Fortune companies in 2005 did not exist in the 1980 list.

Thus, it is very important for public policy to focus the attention on the equity market as a long run determinant of fastest growing firms. A proxy for the number of fast growth firms in a country is the number of Initial Public Offerings (IPOs), that is new firms listed on the Stock Exchange. Moreover one of the most important perceived constraints for firms in backward regions relates to the availability and cost of financing. At micro level the theory of financial growth of small business (Sahlman 1990, Wetzel Jr 1994, Berger and Udell 1998) suggests that very small business rely on insider finance, trade credit, and or angel finance. As firms growth they gain access to intermediate finance on the equity side (venture capital) and on the debt side (banks, finance companies, etc.). Access to public equity and debts markets is a condition for further growth of the firms. If firms, located in different areas, have not the same opportunities to have access or to use the sources of funds necessary to further growth economic development of such areas could be affected. Differences in the distribution of high growth firms may be responsible for the different economic performances among areas within a country. Therefore it is important to know if such differences are linked not only to real variables but also to other variables: efficiency of financial markets, distance from financial markets, etc..

Economic structure determines size and profitability of the firms in a given region and therefore the numbers of firms that satisfy economic and legal requirements in order to be listed and affects indirectly IPO regional distribution. In particular concentration within sectors, through creation of externalities, is a very important factor that could affect regional distribution of IPOs.

The proximity to financial centres is another factor that could effect the probability to go public. In the present paper we concentrate on some factors which appear to determine IPOs regional distribution.

In the first part of the paper we test the hypothesis that distance affects equity capital market in the Italian case. First of all we analyse the factors that affected the regional distribution of firms that went public in Italy during 1995-2004 period. In particular, we addressed the question if the distance from the main Italian financial centre of Milano could affect the decision of a firm to go public. To this aim, we have compared firms which decided to list to the Italian stock exchange with those not listed despite meeting the listing requirements. We estimated a probit model for the probability of going public. The dependent variable is equal to 1 if the firm is an IPO and equal to 0 if the firm stay private. The independent variables are: age (N), natural logarithm of enterprise turnover, the ratio between net profit and sales (RDEF) and kilometric distance between the company's legal seat and the town in Milano. The estimation for the full sample shows a negative effect of distance on the probability to go public.

Such hypothesis is strengthened by the analysis of the effects of distance on IPO underpricing. We analysed the relationship between distance from the financial centre of Milano and underpricing in the period 1995-2006. We used as control variables the usual ones (size, age, market volatility, underwriter reputation, etc). Econometric results show a positive and significant effect of distance on underpricing. These results corroborate the hypothesis of a negative effect of distance on the IPO regional distribution.

Afterwards the analysis have been extended to three countries: Italy, France and UK. Our analysis have been limited to one but very significant sector, the ICT. This is a sector that in the past years registered a very high number of IPO and is characterized by an high number of high growth firm. We show that variations between regions in the IPO in ICT industry are negatively correlated with distance and positively with the degree of specialization in computer and related services industry.

2. The effect of distance on the IPO listing prices

Finance literature has singled out different kind of costs to go public (flotation cost, on-going financial cost, disclosure requirements, loss of control and agency costs, to cite a few) and different benefits (such as acquisition, organic growth, repay debt, new finance for increased opportunities for future equity offers, greater publicity/better company images, increased liquidity of share, outside monitoring, etc). Table 1 shows how Italian firms weight the importance of different costs and benefits to go public. Some of these costs and benefits could be affected by distance. Therefore *distance from financial market* is a factor that contributes to uneven distribution of new firms

Table 1: Costs and benefits to go public in a sample of Italian firms

Benefits	Percentage of firms that estimated important the benefits	Costs	Percentage of firms that estimated important the costs
Opportunity to raise new capital for the development	65,5	Costs after the firm has turned public	61,8
Improvement of financial structure of the firm	57,9	Direct and indirect issuing costs	61,8
Improvement of planning of the firm	38,2	Instability of the market price of the share	41,5
Improvement of the organisation structure of the firm	26,5	Weaker control of the firm	30,5
Better firm image	23,3	Inadequate Ipo issue price	27,5
New governance	14,9	Organization cost and other fulfilment.	23,3

Source: Deloitte Financial Advisory services (2006)

The IPO issuing costs could increase with distance because it is more costly to exchange information with investment banks (IB) that are located away from the firm. There are also higher travel and time consuming costs that are positively affected by distance. If the firm is not known by market investors it must bear costs to advertise its stock issue, and greater is the distance from financial centre higher will be such costs. If investment bank on the other part must bear extra costs to gather information about the firm they could ask a larger fee. Coval and Moskowitz (2001) maintain that geographic proximity is inversely related to the cost of information acquisition. Therefore a firm located far away from the most important financial centres is in worst position to have access to venture capital or to the equity market than firms that are nearer. A firm that have to raise S euros in order to undertake some potentially valuable investment opportunities will have a lower net present investment (NPV) of such projects if there are high issuing costs: this will determines a lower IPO issue price.

But the main impact of distance on the IPO issue price is through the increase of the uncertainty and of asymmetric information.

Models based on information asymmetries between the issuers and underwriters predict that offer prices will be lower than would prevail in the absence of asymmetric information (Baron, 1982).

There is a positive correlation between the expected underpricing and ex ante uncertainty and the lack of information (Myers,1984, Beatty and Ritter,1986). Malloy (2005) investigates the effect of distance on the accuracy of equity analyst's forecast. He gave evidence that geographically proximate analysts are more accurate than other analysts. An implication of this finding is that there is an inverse relationship between the accuracy of information and distance.

Let V the market value of the firm (price per shares time the number of shares) if it does not issue shares and V' the market value if the firm issues shares. Let S the value of issued stocks and assumes that the new shares will be subscribed by new investors. Let the managers know well V and V' but investor in capital markets do not; they know only a distribution $N(V')$ of possible values. If the share issue price is based on the expected value $E(V')$ of the firm when

$$E(V') - S \leq V \quad (1)$$

owners will find that the value of their shares is lower than the true value of the firm, if it does not issue shares, and they will find it not worth to go public.

If distance increases asymmetric information and the distribution of possible market values of the firm is more skewed towards lower values of V' the expected value of distribution, $E(V')$, will decrease and the variance will increase. Therefore for a given V , the probability of no issues will increase.

Therefore the probability to go public will be lower for firms that are more far from financial centre.

We have considered only two players in the issue of shares game, but players are three: Investment Bank (IB), Firm, and investor on capital markets. Firms sell shares in an equity market with asymmetric information through IB. IB have better information on the value of the firms than the market (but they do not know the true values) and have the important function to reveal it to uninformed investors. IB have a strong incentive to overvalue the issue price of the IPO because in such way they gain profit from underwriting fee. On the other hand if IB want to be successful also in the future to take firms to the stock market, they must retain a good reputation in IPOs (Chemmanur and Fulghieri, 1999). Therefore they will provide truthful reports, and will be careful to propose an issue price of the IPO lower than what IB believe is a true value. Therefore the issue price will be not only lower than the value the owner believe true but also lower than the value the IB believe true. Higher uncertainty will decrease the value of the firm that the IB believe true and reduces the IPO issue price. Higher the uncertainty more careful will be the IB to fix the level of IPO issue price, and larger will be the difference between this price and that believed true by IB. Therefore higher uncertainty caused by a greater distance of the firm will determine an higher level of underpricing.

Distance from the main financial centre of the country affects in two ways IPO market:

- a) It decreases the probability that firms far from the financial centre will go public;
- b) It increases the level of underpricing.

In the following part of our work we will test both hypothesis.

3 Distance and regional distribution of IPO in Italy

3.1 Why firm go public

The literature shows at least three main variables which could affect the decision of a firm to go public: size, profitability, age (Table 2). In our estimates we use these variables as control to test our hypothesis on the negative effect of distance on the probability to go public.

Table 2: Variables that affect the probability that a firms goes public with expected correlation

Variables	Size	Age	Profitability
Correlation	Positive	Positive	Positive

Firms' *size* is considered very important for two reasons: a) the fixed costs necessary to support an IPO (Ritter, 1997); b) the cost necessary for producing the information to be passed on the market (Chemmanur and Fulghieri, 1999). Larger companies are more likely to go public.

Firms' *age* is often considered as a variable which affects the decision to go public because it is difficult for the market to give a correct estimation of young enterprises as Leland and Pyle (1977) point out; therefore there is an high degree of uncertainty about the correct evaluation of their shares (Ritter, 1986). In the Italian case the empiric analysis to test a positive correlation between age and decision to go public has often not given significant results (Cassia *et al.*, 2004).

Theory forecast a positive correlation between the decision to go public and *profitability* because enterprises which show a high profitability can also obtain favourable conditions as regards the issue price of shares (Pagano *et al.*,1998).The authors identify a significant difference between the factors underlying the decision to go public taken by a private company and taken by the subsidiary of a publicly traded company (carve-out). Private companies are more likely to go public after major investments and abnormal growth.

The timing of an IPO also depends on the *business environment*. Private companies wishing to go public are valued taking into account multiples of already listed firms (EV/Sales, P/E...)¹. Pagano, Panetta and Zingales (1998) find that the main factor affecting the probability of a company going public is *the market-to-book ratio* at which firms in the same industry trade. A one standard deviation increase in the market-to book ratio raises the odd of an IPO by 25%.Therefore when Stock Market values fall IPO valuations are negatively affected. Therefore the timing to go public is positively affected by the movements in the stock market.

3.2 Data and model

In this section we intend to test the hypothesis that distance from the main Italian financial centre, Milano, could affect the decision of a firm to go public. The Italian Stock Exchange is in the town of Milano, that has the main features of a financial centre (number of financial businesses, legal bank seats, capital circulation, number of employees in financial sector etc).

Our hypothesis will be tested with the following methodology. First we build the sample of companies, N, that have at least a minimal probability to going public in the period examined. Then we compute the vector $X_{i,t}$ of variables that characterize firm *i* (turnover, age, profitability etc); and the vector $Y_{r,t}$ of variables linked to the geographical location of firm *i*. Afterwards we estimate the following probit model:

$$\Pr(\text{IPO}_{i,t} = 1) = F(X_{i,t}, Y_{r,t})$$

IPO is a variable that equal 0 if company *i* stay private in the period *t* and equals 1 if it goes public.

Our sample is formed by 454 observations of which 66 are IPOs and 388 are firms that have all the characteristics to be listed but are not publicly traded companies listed. All these companies belong to the manufacturing sector.

The reference period for the quoted companies goes from 1995 to 2004 and in this time span there were listed 67 IPOs belonging to the manufacturing sector. From these IPOs we removed Eni as it is a privatization operation not directly comparable with the group of the other companies. Therefore the final sample includes 66 IPOs.

Data for the quotable companies are extrapolated by the Capitalia sample², that includes only companies belonging to the manufacturing sector. From this sample, have been selected companies with turnovers higher than 25 mln of euros. Even though such minimum threshold does not represent a requirement for the quotation in the Italian stock exchange, it is considered an essential feature for the access to the Stock Exchange market, as all IPOs of the period taken into consideration have a turnovers higher than the 25 mln of euro. Therefore the distinction among quotable and not quotable enterprises has been led with reference to the turnover dimension. The Capitalia sample takes back the variable values referred at the year 2000 and therefore also for the quoted companies values refer at this year or the year preceding the quotation if this happens before the 2000. Table 3 shows the descriptive statistics of the variables for the IPOs, quotable and not quotable companies.

Sales and the number of employees (mean and median values) are higher for the IPOs than for the not quoted enterprises; Net asset and operating profit of IPOs have greater values, as well.

Instead the age does not seem to give univocal indications. The average age of IPOs turns out in fact superior of 17% with respect to the average age of the not quoted firms but such enterprises difference is not confirmed if we compare the median variable values. We find the same results for the distance: the average distance of the quoted enterprises turns out lower of the average distance of the not quoted enterprises but the relation turns over if we

¹ Are valuation techniques are also taken into account (Sum of the part valuations, DCF and others).

² The Each Capitalia survey covers also the population of large firms (>500 employees).

consider the values as median. It is also interesting that standard distance deviation of the not quoted enterprises is higher than the standard deviation of IPOs.

Table 3: Summary statistics for the samples used in estimation

Variable	Mean	Median	Std. Dev	Min	Max	Obs.
Panel A: The Whole Sample						
Age	35.78604	30	28.28407	0	263	444
Sales	161.8287	72.56	335.4058	23.81	4465.14	454
Employees	600.9137	330	924.2697	14	8620	394
Net Assets	25.33748	8.16	75.40625	-2.11	802.9	453
Net Profit	2.414207	0.3	10.08888	-26.24	133.07	454
Distance	218.4048	163.4	224.3509	0	1494	454
Sector Dummy Variables					Freq.	Percent
Traditional sectors					176	38.77
Large Economy of scale sectors					87	19.16
Specialized and high tech sectors					454	42.07
Panel B: Not Listing Firms Eligibles to go Public						
Age	34.89418	30	26.08961	2	170	378
Sales	154.6913	67.66	333.4881	25.18	4464.14	388
Employees	530.7104	324.5	808.7528	14	8620	328
Net Assets	17.36729	6.765	50.66092	-2.11	677.15	388
Net Profit	1.064021	0.145	7.072078	-26.24	98.9	388
Distance	220.7186	163.4	232.6926	0	1494	388
Sector Dummy Variables					Freq.	Percent
Traditional sectors					155	39.95
Large Economy of scale sectors					82	21.13
Specialized and high tech sectors					151	38.92
Panel C: IPOs						
Age	40.89394	30.5	39.3779	0	263	66
Sales	203.788	103.05	346.083	23.81	2056.52	66
Employees	949.803	589.05	1313.803	64	5985	66
Net Assets	72.91338	26.6	148.1711	5.8	802.9	65
Net Profit	10.35167	5.505	18.35033	-3.64	133.07	66
Distance	204.803	170.4	167.8949	0	789.7	66
Sector Dummy Variables					Freq.	Percent
Traditional sectors					21	31.82
Large Economy of scale sectors					5	7.58
Specialized and high tech sectors					40	60.61

Panel A includes the sample of reference in which both the manufacturing IPOs and the not quoted companies are included; the B Group refers to not quoted companies and panel C to IPOs on the Stock exchange and on New Market. The enterprise age is calculated as a difference in the year of quotation and constitution year of the company; for the companies not quoted the differences is calculated as difference between the year 2000 and year of foundation. The variable turnovers, Net Asset and Operating profits are expressed in mln. The variable distance is expressed in kilometres and represents the physical distance among the legal enterprise seat and the financial center, that is Milano.

In our sample there are two proxies for firms' size: sales and number of employees. The two variables obviously have a narrow correlation, therefore we choose to use only sales³. We have two proxies of firms' profitability: the ratio between operating profit and sales and the relationship between operating profit and net asset. In our estimation we use the relationship between profit and sales since in calculating the second relationship we lose 60 observations. The two variables show an high degree of correlation (0,8) and they give identical results in term of sign and significance of coefficients for all variables.

The estimated model of the probability to go public is the following

$$\Pr(Q_i=1) = F(\beta_0 + \gamma_1 S1_i + \gamma_2 S2_i + \beta_1 N_i + \beta_2 LFATT_i + \beta_3 RDEF_i + \beta_4 DIST_i)$$

Where:

- Q_i is a variable equal to 1 if the enterprise stays private and equal to 0 if it goes public;
- N_i is the enterprises age; it is calculated as a difference between the year of quotation and the year of firm birth for the IPOs, and as difference between 2000 and year of firm birth for the not quoted enterprises;
- $LFATT_i$ is the natural logarithm of enterprise turnover expressed in millions of euros. It is calculated in the year preceding the quotation, for the IPOs and the year 2000 for the not quoted enterprises;
- $RDEF_i$ is the ratio between net profit and sales. Also this variable has been calculated in the year preceding the quotation for the IPOs and in 2000 for the not quoted companies;
- $DIST_i$ is the enterprise distance calculated as kilometric distance between the company's registered office and Milano. In alternative to the variable $DIST$, we have used a variable called T which measures the time necessary for covering the physical distance from the enterprise to the financial center. Estimate results have been substantially the same given the high degree of correlation among the two variables. Therefore we have considered only the results concerning the variable $DIST$ ⁴.

Other explanatory variables are industry dummies:

$S1_i$ is equal to 1 if the enterprise belongs to Traditional Sectors and is 0 otherwise. In the traditional sectors are included food, wood, ceramics, clothing, textiles, etc.;

$S2_i$ is equal to 1 if the enterprise belongs to Sectors with large economies of scale and is 0 otherwise. Such sectors are: rubber, steel, chemistry, etc;

$S3_i$ is equal to 1 if the enterprise belong to the Specialized Sectors (i.e. machinery electric and not electric) or to High Technology (pharmaceutical, data processing, etc).

We have also estimated model 1 without distance and with territorial dummies:

$Z1_i$ is equal 1 if firm i has legal location in North–East (Emilia Romagna, Friuli, Trentino-Alto Adige, Veneto), 0 otherwise;

$Z2_i$ is equal 1 if firm i has legal location in North–West (Liguria, Lombardia, Piemonte, Valle d'Aosta), 0 otherwise;

$Z3_i$ is equal 1 if firm i has legal location in Center of Italy (Lazio, Marche, Toscana, Umbria), 0 otherwise;

$Z4_i$ is equal 1 if firm i has legal location in Southern Italy (Abruzzo, Basilicata, Calabria, Campania, Molise, Puglia, Sardegna, Sicilia), 0 otherwise.

³ The choice is justified by the fact that 60 not quoted companies have omitted to show the number of employees, and therefore we would lose 60 observations.

⁴ We have considered as exogenous variable also the square and the reciprocal of distance, but the results had not been significant.

3.3 Econometric Results

Different estimates of model 1 for the whole sample are given in Table 4. The total observations get down to 444 since we lose 10 observations concerning not quoted companies for whom we do not have information on the age.

All estimates show that important determinants of IPOs are profitability and company's size⁵. Age has never a significant coefficient. As regards distance the sign of the coefficient is the expected ones but, in some of our estimates, it is not statistically significant. Estimates shown by column 1 of Table 4 has a negative sign but not significant of the coefficient of distance. Results change slightly when we introduce the square of distance in the estimates (Column 2). The square of distance has a negative coefficient, significant at the 10%.

Table 4: Coefficient estimates results of probit analysis on the probability that a firm will go public.

Dependant Variable: going public probability of the firms					
	1	2	3	4	5
Intercept	-2.609 ^a (0.454)	-2.942 ^a (0.514)	-3.251 ^a (0.636)	-3.167 ^a (0.556)	-3.192 ^a (0.564)
N	0.0003 (0.003)	0.0004 (0.003)	0.001 (0.002)	0.0008 (0.003)	0.002 (0.003)
LFATT	0.229 ^a (0.007)	0.0251 ^a (0.091)	0.281 ^a (0.093)	0.263 ^a (0.091)	0.304 ^a (0.093)
RDEF	24.408 ^a (2.828)	24.893 ^a (4.36)	24.403 ^a (4.533)	25.351 ^a (4.269)	24.763 ^a (4.378)
DIST	-0.0005 (0.0004)	0.001 (0.001)		-0.001 ^b (0.0005)	-0.001 ^c (0.0005)
DIST2		-3.64e ⁻⁰⁶ (2.36e ⁻⁰⁶)			
Dd				0.626 ^b (0.296)	0.617 ^b (0.297)
S1			-0.365 ^c (0.200)		-0.409 ^b (0.202)
S2			-0.739 ^a (0.265)		-0.739 ^a (0.27)
Z1			0.659 (0.423)		
Z2			0.408 (0.427)		
Z3			0.182 (0.468)		
Wald Test	41.93 ^a	48.20 ^a	54.33 ^a	55.17 ^a	57.44 ^a
Pseudo - R ²	0.3435	0.3528	0.3765	0.3577	0.3802
Observations	444	444	444	444	444

(a,b,c) Significantly different from 0 at the 1,5 and 10 level

Figures in parentheses are standard errors

The no significance of distance could be caused by a different behaviour of firms located in the Metropolitan area of Milano and out of this area. The more dynamic of the manufacturing firms need space to expand their plant and facilities but, in the Metropolitan area of Milano, space is costly and environment law makes difficult the physical expansion of the firm. Therefore firms that want expand will locate their facilities and offices in area far from metropolitan area of Milano. Manufacturing firms that stay within this area are the less dynamic and not interested to go public.

Such hypothesis found support in the age of firms located in the metropolitan area of Milano. We have considered that the ray of the Metropolitan area of Milano is 50 km.

⁵ The correlation matrix indicates that there is no correlation among between the explanatory variables.

Table 5: Age and turnover of firms located within and out 50 km from Milano

	DIST<50	DIST>50
Age		
- IPO	44.27	40.21
- Not IPO	42.6	32.85
Sales		
- IPO	195.6	205.4
- Not IPO	204.8	140.6

Table 5 shows the age of IPO and not IPO firms located within and out the metropolitan area of Milano. The age of manufacturing firms located in the metropolitan area of Milano, and not listed on the stock exchange is 42,6 years; that of firms located in the other areas of Italy, where there are lower problem of congestion, only 32,8 years. A difference of 30% is significant. On the other hand there is not such differences from the IPO of both areas. Most of the non IPO firms of the Metropolitan area of Milano do not go public because they do not need to rise capital to growth. These firms are satisfied with the size that they reached, much higher than that non IPO firms of the other areas.

Therefore we have estimated model (1) with a dummy equal to 1 if the distance of the firm is higher than 50 km and 0 otherwise. So the number of observations is 444. The coefficient of the dummy is significant and has positive sign. Also distance is significant and coefficient has a negative sign (columns 4 and 5).

The positive sign of the dummy means that, *coeteris paribus*, firms located within the area of 50 km from Milano have a lower probability to go public as it was hypothesized.

When we introduce the dummies for the sectors, the coefficient of distance is now significant at 10% level. The sectorial dummies show that enterprises belonging to traditional economies of scale industries have a lower probability to become an IPO than enterprises belonging to specialized and high technology sectors.

In the column 3 of Table 4 we reported estimates of model 1 with territorial dummies and without the variable distance. Estimates show a positive signs of the coefficients of the dummies of North-East (Z_1), North-West (Z_2) and Centre of Italy (Z_3) but they are not statistically significant.

We have also tried estimates removing from the sample the IPOs and not quoted firms located in the metropolitan area of Milano, where for metropolitan area we assume an area with ray of 50 kilometres extent. The new sample is now composed of 354 total observations of which 55 (the 15.54% of the sample) are IPOs and 299 not quoted firms (the remaining 84,46).

The results (Table 6) are very similar to that found in Table 4: distance has negative and significant coefficient.

Our analysis shows that economic structure of regions affects the probability that a firm go public through its effect on size and profitability of firms. Sectors specialization is another important factors that affects the regional distribution of IPO. Distance is the only variables that does not depends from economic structure and that affects IPO regional distribution.

Table 6: Coefficient estimates results of probit analysis on the probability that a firm will go public.

Probit model on firms with a distance higher than 50 km from Milano			
	1	2	3
Constant	-2.678 ^a (0.552)	-2.966 ^a (0.592)	-3.866 ^a (0.850)
N	0.002 (0.004)	0.003 (0.004)	0.003 (0.004)
LFATT	0.258 ^b (0.110)	0.371 ^a (0.120)	0.360 ^a (0.121)
RDEF	32.093 ^a (4.038)	30.976 ^a (4.151)	31.061 ^a (4.121)
DIST	-0.001 ^b (0.0007)	-0.001 ^c (0.0007)	
S1		-0.388 ^c (0.230)	-0.415 ^c (0.235)
S2		-1.535 ^a (0.535)	-1.534 ^a (0.531)
Z1			0.764 (0.570)
Z2			0.706 (0.579)
Z3			0.175 (0.637)
LR Test	125.88 ^a	139.67 ^a	140.39 ^a
Pseudo - R ²	0.4116	0.4567	0.4591
Observations	354	354	354

(a,b,c,) Significantly different from 0 at the 1,5 and 10% level

Figures in parentheses are standard errors

The interesting consequence of our results is that firms located at the different distance from Milano with the same size and profitability have different probabilities to go public. Such probabilities has been computed in Table 7. A firm located in Rome has a probability to go public that is the 32% of that of a firm located at 50 km from Milano.

Table 7: Probabilities to go public and distance

Location of the firms	Distance from Milano in Km	Probability
Brescia	100	13.35
Bologna	210	10.56
Treviso	290	8.85
Roma	570	4.27
Napoli	790	2.33
Reggio Calabria	1250	0.45

The average values of the control variables in the sample of the firms with distance > 50 km are: N = 34, LFATT = 4.407972, RDEF = 0.0146795, dd = 1.

4 Distance and underpricing

4.1 The IPO market in Italy

In Italy the syndicate expected to bring to the market the non listed company is generally made of a local global co-ordinator and a major non-domestic co-ordinator that, depending on the size of the deal, has the same power of the local broker or is placed just below it. The syndicate is then completed by a number of local and foreign brokers, that varies depending the size of the deal.

Local brokers play a fundamental role in the quota reserved to retail investors and local financial investors. Foreign investors cover the demand of foreign institutional investors. The roadshow, organised by the syndicate, doesn't last more than one week and very rarely touch the US market also because of its strict regulation.

All the Italian companies that went public during the period 1999-2006 were offered to the potential new shareholders through the bookbuilding procedure.

Institutional investors are required to express their interest based on the price range given at the beginning of the roadshow. The contacts between the company, the Lead Manager and the fund managers reach their peaks during this period.

The process tend to be quite long and elaborate and is expected to give sufficient information to the Lead Manager expected to fix the final price of the IPO.

Most Italian IPOs have been subscribed more than 3-4 times. It's somewhat enigmatic the way the Lead Manager (and underwriter) decides to convert the orders in the book. In general small institutional investors are requested to put the orders early as early orders receive, on average, a better treatment. Large investors are able to put their orders late without risking any *penalty*. Large investors therefore decide whether to put an order or not when the book is already well covered.

However everyone has the chance to call off the order, also at the very last minute (market conditions might have changed or the book isn't covered as initially expected).

The underwriters take the risk that the IPO is not fully subscribed. If the IPO is not subscribed they are generally compelled to subscribe for the remaining part. It's clear therefore that when the IPO is particularly unsuccessful there is particular interest from the underwriter either to push price below the price range or to call off the deal.

In order to decrease the level of volatility during the first days of trading Lead Managers of Italian IPOs has ,as instrument: the *overallotment option* (greenshoe). The overallotment option refers to the practice of allocating a greater number of shares than the advertised deal size. The Lead Manager through the overallotment option is able to support the share price (only if it goes below the IPO price) without having to incur in high losses. The greenshoe therefore not only guarantees a parachute to the new shareholders but also a good source of revenues for the syndicate.

4.2 Data and variables

Nearly all IPOs analysis have found significant abnormal returns on the first day of trading. The distribution of initial returns is highly skewed, with a positive mean and a median near zero. The average initial return varies from country to country (Ritter1997). Ritter estimated the average initial returns for 32 countries. He shows that in seven countries the return is less than 10%, in eight countries between 10 and 20%, in two countries is between 20 and 30%, in the remaining countries the return is higher than 30%.

In our analysis we have considered IPOs that took place in all markets of Italian Stock exchange (Blue Chip, Star, Standard, Expandi) on the period 1999-2006. During this period nearly all the companies have been floated using the bookbuilding procedure. A total of 135 IPO were considered. In Italy underpricing has been studied by many authors (Cherubini-Ratti (1991), Arosio et al. (2000), Fabrizio e Samà (2001),Cassia et al (2004), but no one analysed regional differences.

Tables 8: Characteristics of IPOs in the period 1999-2006 in relation to the whole sample and to smaller sub-samples.

Variables	Mean	Median	Min	Max
Whole sample				
Age	27.8	17	1	171
Sales	439.24	111.7	0.48	21542.45
Net profits	33.28	3.55	-22.21	2213.53
Total assets	1657.94	121.48	3.1	91790
Net Capital	300.32	28.02	-1.01	18573.19
Sectors of activities				
Total IPO	135			
PIPO	16			
ECO	13			
Sectors of activities				
Industrial	62			
Services	57			
Financial	15			

We have considered in our sample only firms that go on the equity market for the first time. We have, also, removed from our sample some observations that could be considered outliers. The average value of underpricing was 43,24% in the first semester 1999 and 52% in the first semester 2000. In the other semesters the average values is in between -1,42% e 12,39%. Such differences were caused by the speculative bubble in the internet sector. Therefore we have removed some firms belonging to the internet sector that could be considered outliers. The number of IPO in our sample is therefore lower than the number of firms that went public in the period 1999-2006.

We have 16 IPO that are government owned firms and 13 are carve-outs⁶.

Two measures of underpricing were calculated: raw return and market adjusted return.

The raw return is calculated as

$$R_i = (P_i - S_i) / S_i$$

So that R_i is the return of the firm i 's share, calculated as the difference between the last sale price on the day of initial listing (P_i) and the subscription price S_i divided by the subscription price.

We also have computed market adjusted return (R^*_i) as difference between the raw return and the change of the market index R_m during the first day of listing⁷. We have used the MIB 30 as index of the Italian stock market⁸. Data to calculate underpricing are those published by Borsa Italia SPA.

Financial and other informations about firms are those included in the IPO prospectus.

The exogeneous variables used in our estimates could be divided in four categories in relation to the characteristics of the issue, characteristics of the firms, market condition and distance from financial center:

Variables related to the characteristics of the issue

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) has used such variable. If there was great interest for the IPO the issue prices will be in top part of the range. In Italy the IPO price never was higher than the top of the range and six times the price was below the bottom of the range.

⁶ Carve-Out is the listing of a firm that is controlled by a firm already listed.

⁷ Estimated with market adjusted underpricing were very similar and they have not been reported in the paper.

⁸ We make the hypothesis that the β of the familiar market model is 1; our asset is expected to receive a return equal to that of the market R_m . Such hypothesis is usual done in most of the works on underpricing.

Reputation is a dummy that has a value equal to one if the underwriter has a good reputation and zero otherwise. There is a large body of literature⁹ that has examined the effects of underwriter reputation on the initial performance of the IPO. The better reputation of the underwriter, the lower is the ex-ante uncertainty and consequently the underpricing. There are several proxies for underwriter reputation. Carter and Manaster (1998) has found that each of the reputation proxies is significantly related to IPO initial returns; the better the reputation of the underwriter, the less is the short-run underpricing.

Range Institutional investors are required to express their interest based on the price range given at the beginning of the roadshow. This variable is a proxy of the uncertainty and higher is the uncertainty about the true value of the IPO higher is underpricing .

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

Greenshoe refers to the practice of allocating a greater number of shares than the advertised deal size. The Lead Manager through the overallotment option is able to support the share price (only if it goes below the IPO price) without having to incur in high losses. The greenshoe therefore not only guarantees a parachute to the new shareholders but also a good source of revenues for the syndicate. The greenshoe reduces the risk of the issue and the expected underpricing.

Variables related to characteristic of the firm

Firm size have frequently been used to proxy investors' ex ante uncertainty. Larger the firm lower is the uncertainty about the its true value. In this work size has been computed as the logarithm of total asset in the period before the listing.

Age The length of operating history prior to going public has been considered has important proxy for uncertainty and therefore older is a firm lower is the uncertainty. In this work age is computed as the natural logarithm of the difference between the year of the listing and the year of birth of the firm.

Ownership. The ownership of the IPO affect the uncertainty of the issue. Government owned firm (PIPO) and equity carved out are considered less risky than IPO where the owner is new on the equity market. Pagano, Panetta and Zingales (1998) identify a significant difference between the factors underlying the decision to go public taken by a private company and taken by the subsidiary of a publicly traded company (carve-out). Private companies are more likely to go public after major investments and abnormal growth.

Variables related to Business environment

Private companies wishing to go public are valued taking into account multiples of already listed firms (EV/Sales, P/E...) ¹⁰. Therefore when Stock Market values fall IPO valuations are negatively affected. Therefore the timing to go public is positively affected by the movements in the stock market. The importance of such factor in the decision to go public is proved by Loughran (1994) that found that in 14 of the 15 countries they examine, the IPO volume is positively correlated with inflation adjusted level of the stock market.

Two are the variables used in our work that are related to the behaviour of the stock exchange.

The dynamic of the market has been computed as the percentage change in the MIB 30 in the twenty working days before the listing. If the market is bullish investors are induced to upgrade their estimated on the value of a firm. Therefore we expect that underpricing will increase

Volatility of the market increases the systematic risk and investor will be more careful in the evaluation of the IPO. Therefore an higher volatility increase uncertainty and the level of underpricing. Volatility has been computed as the variance of the MIB 30 in the 60 working days before the listing.

These two variables has been considered by Cassia et al. (2003), and authors found a positive coefficient for the dynamic of MIB 30 and a negative sign for the volatility of such index

Variables related to distance

⁹ Beatty and Ritter (1986), Titman and Trueman (1986), Maksimovic and Unal (1993), Carter, Dark and Singh (1998)

¹⁰ Are valuation techniques are also taken into account (Sum of the part valuations, DCF and others)

Distance has been measured as by the km from Milano and the legal headquarter of the firm. Table 9 describe the variables and the expected sign on the dependat variable.

Table 9: Definition of variables and expected effected

Variable	Description
Dependants Variables	
Underpricing	<p>Underpricing equals::</p> $\frac{P_U - P_{IPO}}{P_{IPO}} * 100$ <p>Where P_U is the firm's official price at the end of first day of trading and P_{IPO} is the offer price of the shares.</p>
Adjusted Underpricing	Adjusted Underpricing is the difference between Underpricing and the return of the Mib30 index, both evaluated at the first day of trading.
Mlot	<p>Money Left on the Table in mln of Euros, equals :</p> $(P_U - P_{IPO}) * N$ <p>Where N is the number of shares sold in the initial public offering.</p>
Independents Variables	
Distance	Distance in Km between the city of Milano and the headquarters of the firm.
Revision	<p>Revision equals</p> $\frac{P_{IPO} - P_{MIN}}{P_{MAX} - P_{MIN}}$ <p>Where P_{IPO} is the offer price of the share, P_{MIN} e P_{MAX} are the high and low end of the bookbuilding price range.</p>
Total Asset	Total asset of the firm in mln of Euros. evaluated in the year before the initial public offering.
Age	Age is the IPO year minus the year of foundation of the firm, as disclosed in the IPO prospectuses.
Mib30 Return	<p>Return of the Mib30 index in the month before the initial public offering, equals.</p> $\frac{Mib30_{t-1} - Mib30_{t-20}}{Mib30_{t-20}} * 100$
	Expected Sign
	Positive
	Positive
	Negative
	Negative
	Positive

	Where Mib30 is the index and t the day of flotation. The lags refers to the day trading.	
Mib30 Volatility	Variance of the Mib30 index returns in the two month before the initial public offering.	Positive
Underwriter Reputation	Dummy equals to 1 if the underwriter show high reputation on capital markets, 0 otherwise.	Negative
Greenshoe	Greenshoe number of shares divided the number of shares sold in the initial public offering.	Negative
Oversubscription	Number of institutional investors that offer the shares divided the number of institutional investor that obtain the shares.	Positive
Range	Bookbuilding range equals: $\frac{P_{MAX} - P_{MIN}}{P_{MIN}} * 100$	Positive
Fees	Fees are the charges that the firm pay to the underwriter. The commissions are evaluated in percentage terms of the money raised in the initial public offering.	Positive

4.3 Results

The estimates of the factors that has determined underpricing in the period 1999-2006 are reported in Table 10. Column 1 shows estimates for the whole sample; column 2 shows estimates after removing privatization initial public offerings and carve-outs; column 3 refers to estimates with a sample from which has been removed also financial IPOs. The regression has been estimated with OLS with an heteroscedasticity consistent variance and covariance matrix.

The regression of the whole sample have the expected sign for all coefficients, with the exception of the variable *range*. This variables is a proxy for uncertainty and we expect a positive correlation with underpricing. The coefficient is negative but not significant. This results is similar to what found in other estimates. A reason could be that the range is decided six months before the day of the listing and in this period the underwriters could receive enough information to change its initial evaluation. The coefficient of the variable *age* is not significant. All other coefficients are significant, and distance is significant at 10% level. The dummy for reputation is significant with a negative sign ,as expected¹¹.

When we remove from the sample PIPOs and Carve-Outs our results improve. Age has a statistically significant coefficient and the coefficient of distance became significant at 1%. Size, on the other hand, became not significant; adjusted R^2 increases from 0.4443 to 0.4878.

When we remove from the sample Financial Firms the variable size is significant and the coefficients of the other variables are still significant.

¹¹ Habib e Ljungqvist (2001) have shown that the choice of the underwrtirer could be controlled by the IPO and therefore reputation could be a variable endogenous to the model, and have a positive coefficient.

Table 10: Multivariate regression analysis on the determinants of underpricing in Italy in the period 1999-2006

	Whole Sample	Without PIPOs and Carve-Outs	Without Financial Firms	Classification A	Classification B	With Fees
	1	2	3	4	5	6
Intercept	16.82 ^c (8.799)	17.85 ^c (10.62)	17.86 (11.176)	11.68 (10.183)	17.18 (10.99)	-6.597 (13.286)
Distance	0.013 ^c (0.007)	0.021 ^a (0.007)	0.023 ^a (0.008)	0.021 ^a (0.007)	0.024 ^a (0.008)	0.028 ^a (0.009)
Revision	7.255 ^a (2.333)	5.89 ^b (2.581)	5.157 ^c (2.702)	6.147 ^b (2.645)	4.9 ^c (2.724)	5.407 ^b (2.717)
Ln Total Asset	-2.443 ^a (0.719)	-1.846 (1.198)	-2.423 ^c (1.284)	-1.916 (1.195)	-2.402 ^c (1.36)	-1.556 (1.481)
Ln Age	-1.629 (1.38)	-3.682 ^c (1.908)	-3.721 ^c (1.971)	-2.5 (1.943)	-3.482 ^c (1.953)	-3.077 ^c (1.798)
Mib30 Return	0.99 ^b (0.428)	1.08 ^b (0.467)	1.18 ^b (0.477)	1.151 ^b (0.469)	1.054 ^b (0.464)	1.069 ^b (0.491)
Mib30 Volatility	3.68e ^{-0.6 c} (2.06e ⁻⁰⁶)	3.58e ^{-0.6 c} (2.05e ⁻⁰⁶)	3.54e ^{-06 c} (2.02e ⁻⁰⁶)	3.41e ^{-0.6 c} (1.97e ⁻⁰⁶)	3.38e ^{-0.6 c} (1.97e ⁻⁰⁶)	3.51e ^{-06 c} (1.93e ⁻⁰⁶)
Underwriter Reputation	-5.764 ^c (2.954)	-7.31 ^b (3.269)	-7.79 ^b (3.513)	-7.448 ^b (3.251)	-7.87 ^b (3.451)	-7.683 ^b (3.607)
Greenshoe	-0.654 ^b (0.307)	-074 ^b (0.343)	-0.644 ^c (0.363)	-0.721 ^b (0.331)	-0713 ^b (0.357)	-0.603 ^c (0.329)
Oversubscription Range	8.711 ^c (4.632)	11.09 ^c (6.223)	12.139 ^c (6.394)	11.23 ^b (5.652)	12.22 ^b (6.29)	12.598 ^b (6.280)
S1				6.77 ^c (3.491)		
S3				7.66 ^c (4.371)		
Sec1					-2.54 (3.971)	-1.792 (4.178)
Sec2					6.63 (5.129)	9.454 ^c (5.376)
Sec4					6.11 (6.041)	10.048 (6.195)
Sec5					12.99 ^a (3.857)	14.714 ^a (3.946)
Sec6					5.6 (5.599)	9.512 ^c (5.709)
Fees						3.599 ^c (1.883)
R ²	0.4443	0.4878	0.4948	0.5131	0.5094	0.5447
Observations	135	106	100	106	106	99

Figures in parentheses are standard errors
(a,b,c,) Significantly different from 0 at the 1,5 and 10% level

The effect of distance on underpricing could be caused by the different territorial distribution of the firms. We have therefore considered dummies for the different sectors. In Table 11 are shown two different disaggregation of the sectors. The first one is that used by Borsa Italia SPA. We have three sectors: industrial, services and finance.

A second one is more disaggregated. We distinguish between utilities and manufacturing. In this last sector we differentiate between traditional, economy of scale and high tech sector.

Tab 11: Disaggregation of sectors

Panel A	
Dummy	Sector
S1	Services
	Retail, wholesale, Utilities, Transport, Tourism, Other services
S2	Industrial sector
	Manufacturing, Building and Others
S3	Fiancial services
	Insurance, Banks, Financial services, Real estates and Other financial services
Panel B	
Dummy	Sector
Sec1	Traditional sectors
Sec2	Economy of scale sectors
Sec3	High Tech sectors, IT sectors and Specialized sectors
Sec4	Financial services
Sec5	Utilities
Sec6	Other services

Results of our estimates are shown in Table 10. When we use classification A we find that underpricing is lower in the industrial sector (column 4). When the classification B is used dummies are no more significant but the significance of other coefficients increases and R2 increases from 0.4878 to a 0.5094 (column 5). In both cases distance is still significant.

An interesting result, shown in the last column, is that if we add in our regression the variable fees paid by IPO to the underwriter we found a positive correlation.

5. Distance and the determinants of IPO regional distribution in the ICT sector in three European Countries: France, Italy, UK.

In the previous sections we have investigated the effect of distance from the financial centre of Milano on the probability that a firm goes public. Our hypothesis is that firms located at the different distance from the main financial centre with the same economic and structural characteristics (i.e size and profitability) have different probabilities to go public. Therefore we could expect that the number of IPO located in a region, once that we have considered the structural variables that characterize the area (population, index of sector specialization and so on) will decrease with the distance from the main financial centre of the country. In this section we want verify such hypothesis as regards the number of IPOs in the ICT sector of three countries, France, Italy, UK. The stock markets of the three countries considered have only one big financial centre (Milano, Paris, London). We have not considered other european countries that have more than one financial centre. In Germany for instance there are many financial centres. The main stock exchange is at Frankfurt, but there are 5 regional stock exchanges: Berlin/Bremen, Hamburg/Hannover, Dusseldorf, Munich and Stuttgart. In Germany firms that want go public could therefore choose between different stock exchanges. We will consider the period 1999-2001 when there was a very high rate of start-up of IPO in the ICT sector. The dependent variable is the number of IPO per capita in a given region. The total number of observations is 52 distributed as follows: 21 regions in France, 19 regions in Italy, and 12 regions in UK.

The dependent variable is the number of IPO per capita. First we have estimated a regression model where explanatory variables are: the logarithm of distance of the chief town of the region from the main financial centre of the country and dummy variables for the countries (Table 12, Column 1). The result shows a negative and significant coefficient of the logarithm of distance.

We have repeated the estimation adding to the previous model explanatory control variables. From the literature on ICT sector one could extrapolate the most important variables that affect IPO regional distribution. Such variables are linked to spatial externalities that characterize ICT industries. A first kind of externality arises in the labour market. In regions where ICT production is substantial, ICT industries firms benefit from a large market of skilled and experienced people and therefore search, recruitment, and training costs are greatly reduced. ICT firms face a high fluctuating demand both for cyclical factors and because there is a very fast substitution of old products with new one. If there is an outside pool of skilled labour in the geographical area around the firms, these are released from a commitment to a large internal work force that must be laid off or called back as demand fluctuates. When firms require highly specialized skills to solve occasional esoteric problems that go beyond the capabilities of their regulars staff they could easily turn to outside specialists if they are located near the firms.

Another kind of externality could arise because geographical proximity facilitates and intensifies transmission of information (knowledge spillovers). ICT industries are both vertically and horizontally linked and therefore share a lot of common knowledge. A recent paper by Vicente and Suire (2007) shows that information externalities (and observational learning) play a major role in the formation of ICT cluster, whereas network effects are the significant condition of their stability. Information exchange and knowledge spillovers are distinguished features of many technological high tech clusters such as Silicon Valley¹². The high level of externalities increase the opportunities for new firms to grow. Therefore we expect a positive relationship between IPO regional concentration and ICT spatial specialization.

Another important variable that must be considered is the specific knowledge. A proxy of the diffusion of ICT knowledge in a given area could be given by the number of patent per capita (p.h.). In this paper we refer to the number of patents since 1978 for the following industries which are part of the ICT sector: “Manufacture of office, accounting and computing machinery” (ISIC–D300); “Manufacture of radio, television and communication equipment, and apparatus” (ISIC–D320); “Hardware consultancy” (ISIC–K721).

¹² One of the pioneer of Silicon Valley, Nolan Bushnell illustrated this point: There is a tremendous amount of networking here in Silicon Valley, unmatched anywhere else. I recently visited a group of engineers in London who were working on a new product in competition with a group here in Silicon Valley. Both started at the same time, but the Silicon Valley team got the jump by six months. Our group included an engineer that had a friend worked at Intel. He smuggled out a couple of prototypes of a new chip that was just what they needed. The chip was soon to be on the market, but it was not yet in the catalog. “Reported by J.K.Larsen - E.M.Rogers” Silicon Valley fever Unwin paperback 1984.

We have estimated a model where the explanatory variables are: the logarithm of the distance, the number of the patents (per million people) and the employment in “Computer and related activities” (ISIC–K72) as percentage of total employment in Manufacturing and Market services at 1998, both before the IPOs¹³. We report OLS estimates of the parameters of interest for the overall sample of 52 regions (Table 12, Column 3).

Table 12: The determinants of ICT IPO regional distribution in three European countries

	1*	2**	3***	4****
LNDistance	- 0.3953351 ^a (-3.70)	- 0.0400233 (-0.34)	- 0.183421 ^a (-3.25)	0.0354385 (0.32)
PATP			0.003101 (0.24)	0.0005783 (0.38)
SK72			0.7324201 ^a (3.75)	0.4676854 ^b (2.49)
UK	0.2689164 (1.33)	0.3609898 ^c (1.94)	0.312460 ^c (1.82)	0.3515478 ^c (1.94)
F	0.279518 (1.43)	0.259229 (1.57)	0.62368 ^a (2.88)	0.5026459 ^b (2.24)
R ²	0.5387	0.1024	0.7217	0.2907
Observations	52	49	52	49

(a,b,c) Significant at 1,5, 10%

t statistics in parenthesis

* Whole sample and without control variables

** Whole sample, without control variables and without Lombardia, Ile de France, Greater London

*** Whole sample

**** Whole sample and without Lombardia, Ile de France, Greater London

PATP - Number of patents per capita . for region in the ICT sector

SK72 - Employment in “Computer and related activities” (ISIC–K72), as percentage value of total employment in Manufacturing and Market Services at 1998.

LNDistance - natural logarithm of the distance

Country dummies: UK= United Kingdom; F=France

The coefficient of distance is negative and significant at 1% level. The value of R² is equal to 0,72 and the coefficient of the variable SK72, the percentage of employment in ICT, is significant at 1%. Countries dummies are also significant. In order to check if these results are robust the above regression has been estimated without the regions where are located the main financial centres (Greater London, Ile de France, Lombardia). In this regression SK72 and the dummies are significant but not the coefficient of distance.¹⁴ (Table 12, Column 1 and 3). This result could be caused by the fact that IPO in the ICT sector are concentrated, as the ICT industry, in the regions where are located the main financial. Therefore the exclusion of these regions could affect the result. Further investigation with more observation are needed.

¹³ The number of IPOs are relative to the level of population at 1999, the number of patents are relative to the level of population at 1998, which is the last year covered by the data set on patents. Employment in “Computer and related activities” is entered as percentage value of total employment in Manufacturing and Market Services at 1998.

¹⁴ When we consider the sample with England and Italy regions, but not those of France, the coefficient of distance is negative and significant also without Greater London and Lombardia.

7 Conclusions

This paper has analyzed the effect of distance on IPO regional distribution. The study of this subject is justified by the evidence that differences in the distribution of IPO (a proxy) for high growth firms may be responsible for the different economic performances among areas within a country.

An important literature has emerged identifying the empirical determinants of the going public decision. Size, profitability, age, market-to-book ratio, etc. are the main variables that affect the decision of firm to go public. However, a limitation of this literature is that geographic aspects that could affect IPO regional distribution have been not considered. In our paper we have tested the hypothesis that the geographic proximity to financial centre is a factor that could affect positively the probability to go public.

The impact of regional concentration of financial services, in the case of Italy, has been studied in the first part of the paper. Listing costs, uncertainty, and information asymmetries increase with the distance from the main financial centre. The probability that a firm far away from a financial centre will decide to go public will be lower than that of a firm nearer to a financial centre, if the distance affects negatively the issue price. Econometric results have shown negative and significant effect of distance from the main Italian financial centre of Milano on the decision of a firm to go public. In this paper has been also estimated a simulated a model that shows the distance of firms from the financial centre of Milano affects positively underpricing. Therefore concentration of financial services in one region affects the regional distribution of IPO. In the last part of the paper we have shown that variations between regions in the IPO in ICT industry that are related to the degree of ICT specialization in computer and related services industry, and that also distance could affect IPO region distribution.

By utilizing different data set and methodologies this paper has asked the question “distance from the main financial centre of a county affects IPO Regional distribution”. The answer found in this paper is a positive one. However the most robust results look at Italian experience. Further research must examine other countries and investigate if there are significant factors that increase the gap in the opportunities that firms of different regions have in going public. One important question is that difference in the institutional differences of capital market ,i.e. central versus decentralized system of stock exchanges, affects IPO regional distribution.

One implication of the results of the paper is that public policies must find instruments that could reduce the negative effects of distance on listing costs, uncertainty and information asymmetries (i.e. the location of regional branches of stock exchange well connected to the main market).

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Appendix A1. Sources:

- D30: Eurostat-New Cronos
- D32: Eurostat-New Cronos
- K72: Eurostat-New Cronos (Germany: Statistisches Bundesamt-IIID2-Beschäftigtenstatistik; UK: Annual Employment Survey: Employee Analysis-ONS Crown)
- Employment in manufacturing and market services, GVA in manufacturing and market services: Cambridge Econometrics.

Appendix A2. Regions and Countries:

GERMANY

BadenWürttemberg, Bayern, Berlin, Brandenburg, Bremen, Hamburg, Hessen, MecklenburgVorpommern, Niedersachsen, NordrheinWestfalen, RheinlandPfalz, Saarland, Sachsen, SachsenAnhalt, SchleswigHolstein, Thüringen.

FRANCE

Île de France, ChampagneArdenne, Picardie, HauteNormandie, Centre, BasseNormandie, Bourgogne, Nord PasdeCalais, Lorraine, Alsace, FrancheComté, Pays de la Loire, Bretagne, PoitouCharentes, Aquitaine, MidiPyrénées, Limousin, RhôneAlpes, Auvergne, LanguedocRoussillon, ProvenceAlpesCôte d'Azur, Corse.

IRELAND

ITALY

Piemonte-Valle d'Aosta, Liguria, Lombardia, Trentino Alto Adige, Veneto, Friuli-Venezia Giulia, Emilia-Romagna, Toscana, Umbria, Marche, Lazio, Abruzzo, Molise, Campania, Puglia, Basilicata, Calabria, Sicilia, Sardegna.

UK

Cleveland, Durham (NUTS95), Cumbria (NUTS95), Northumberland, Tyne and Wear (NUTS95), Humberside (NUTS95), North Yorkshire (NUTS95), South Yorkshire (NUTS95), West Yorkshire (NUTS95), Derbyshire, Nottinghamshire (NUTS95), Leicestershire, Northamptonshire (NUTS95), Lincolnshire (NUTS95), East Anglia (NUTS95), Bedfordshire, Hertfordshire (NUTS95), Berkshire, Buckinghamshire, Oxfordshire (NUTS95), Surrey, EastWest Sussex (NUTS95), Essex (NUTS95), Greater London (NUTS95), Hampshire, Isle of Wight (NUTS95), Kent (NUTS95), Avon, Gloucestershire, Wiltshire (NUTS95), Cornwall, Devon (NUTS95), Dorset, Somerset (NUTS95), Hereford and Worcester, Warwickshire (NUTS95), Shropshire, Staffordshire (NUTS95), West Midlands (County) (NUTS95), Cheshire (NUTS95), Greater Manchester (NUTS95), Lancashire (NUTS95), Merseyside (NUTS95), Clwyd, Dyfed, Gwynedd, Powys (NUTS95), Gwent, MidSouthWest Glamorgan (NUTS95), BordersCentral FifeLothianTayside (NUTS95), Dumfries and Galloway, Strathclyde (NUTS95), Highlands, Islands (NUTS95), Grampian (NUTS95), Northern Ireland (UK)(NUTS95).