TO DISCLOSE OR NOT TO DISCLOSE?

THE UNBIASED EFFECT OF NON-FINANCIAL INFORMATION IN IPOS

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Abstract

We study the effects produced by Intellectual Capital (IC) disclosure on the IPO results. Previous findings provide inconsistent results, possibly due to the multiple ways in which IC is classified.

In this paper we disengage from the traditional IC classifications and we make use of a principal component analysis (PCA) applied to the IC information disclosed in the listing prospectuses of a sample of firms recently listed on Borsa Italiana in order to let the data freely suggest the most relevant and unbiased IC categories by themselves. We then put the unbiased IC components revealed by the PCA into a series of regressions in order to study their effects on the behavior of primary and secondary market investors in the IPO. We find that primary market investors are sensitive to information regarding the way firms deal with their human resources, while secondary market investors appreciate information about research and development plans together with strategic alliances.

Keywords: IPO, Underpricing, Intellectual Capital Disclosure, Price Adjustment, IC classification

JEL: G12, G32, M14

1. Introduction

In the last years, firms have increased the disclosure of non-financial information regarding their business in order to face the new challenges coming from worldwide competition, globalization and technological changes. The phenomenon has revealed to be of great importance for listing firms, as the amount of publicly available information for IPOs is limited due to their short reporting history (Ding, 2015); additional information on intangible assets is therefore an important source of information for investors. Nevertheless, lots of firms are still reluctant to communicate their Intellectual Capital (IC) assets in their listing prospectuses: managers may have concerns that the disclosure of negative information might results in the issued being undersubscribed as investors react to potentially unfavorable outcomes (Ding, 2015) and also they might fear to release proprietary information thus losing their competitive advantage (Verrecchia, 1983); in addition to this, the disclosure of IC is often perceived as to give rise to unnecessary costs (Mangena, Pike and Li, 2010). That being so, firm's evaluation is still largely dominated by quantitative financial data.

In addition to this, there is no empirical evidence strongly and consistently supporting the positive effects that firms might obtain from the disclosure of non-financial information. Previous literature has tried to solve the puzzle about the effects of IC disclosure on the IPO results but the empirical evidences are scarce and often inconsistent: some of them maintain a positive effect of the IC disclosure in terms of a narrow underpricing (Dimosvki and Brooks, 2006; Ding, 2015; Hanley and Hoberg, 2010) and some others make a warn from potentially negative consequences in terms of a larger first day initial return (Singh and Van Der Zahn, 2007; Cardi and Mazzoli, 2015). The above mentioned contrasting evidences are also rarely comparable as the non-financial information that is considered from time to time is different or differently categorized. On the one hand, some authors consider the amount of IC disclosed into the listing prospectus by means of the disclosure of single IC items such as brands and trademarks (Dimosvki and Brooks, 2004 and 2006) or the description of the risk factors (Hanley and Hoberg, 2010; Ding, 2015); on the other hand, more sophisticated and comprehensive IC classification are often taken from the traditional intangibles literature

(Sveiby, 1997; Stewart, 1999; Guthrie and Petty, 2000; Meritum, 2002; Lev and Zambon, 2003; Chiucchi, 2004; Boedker et al., 2005; Previati and Vezzani, 2007) but authors make use of different categorization (Singh and Van Der Zahn, 2007; Cardi and Mazzoli, 2015). The differences in the IC information or classification that is considered is likely to produce discrepancies in the empirical evidences and this results in restricted ad unreliable operative recommendation being provided to firms in terms of the IC information that they should disclose in their prospectuses in order to please investors (Cardi, Mazzoli and Severini, 2016). Truthfully, the large heterogeneity of IC information that is considered in the previous studies reflects the same heterogeneity that is allowed to listing firms in their prospectuses; in fact, the disclosure of non-financial information still constitutes a voluntary practice and no standard framework is imposed by regulators to firms to disclose such information.

In this paper we try to contribute to the above mentioned debate regarding the effects of IC disclosure on the IPO results by disengaging from previously proposed categorization that could produce biased results. In particular, we emancipate from the traditional IC classifications proposed in the literature and we analyze in more depth the single intellectual capital items that influence the behavior of primary and secondary market investors. To do so, we consider all the IC information that is provided into the listing prospectus of a sample of firms recently listed on Borsa Italiana by considering a series of 87 variables, as suggested by Cordazzo (2007), and we apply a principal component analysis to such information in order to let the data freely suggest the most relevant and unbiased IC categories by themselves. We then put the IC components revealed by the PCA into a series of regressions in order to study their effects on the behavior of primary and secondary market IPO investors. At this time a robustness check is carried out by testing the same methodology on a different series of 61 IC variables suggested by Haniffa, Pike and Li (2008). Our empirical evidences are robust to the test and show that IC information is largely appreciated by investors in IPOs; in particular, primary market investors are sensitive to information regarding the way firms deal with their human resources, as revealed by the price adjustment, while secondary market

investors appreciate information about research and development plans together with strategic alliances, as suggested by the underpricing.

The remainder of the paper is organized as follows: in section 2, we review the literature on the relationship between IC disclosure and IPO results; in section 3 we describe the research design in terms of data and methodology and we illustrate our main hypotheses, while a discussion of the key findings is presented in section 4. Section 5 concludes.

2. Literature review

The current competitive and complex environment is characterized by high levels of information asymmetry between firms and investors. Such asymmetries are particularly relevant for the information concerning the non-financial assets of the companies due to the uniqueness and the specificity of such elements and also due to heterogeneity of intellectual capital reportings (Aboody and Lev, 2000; Mangena Pike and Lì, 2010). As a consequence, a gap between the book value and the market value of firms is often observed (Holland, 2003; Beattie and Thomson, 2004). The diffusion of IC information allows market participants to better understand the prospective value of the company leading to a more efficient capital market and lower direct and indirect costs of financing (Lev, 2001; Williams, 2001; Beattie and Thomson, 2007; Guthrie et al., 2007).

Starting from the theoretical studies, recent empirical works have tried to study the association between the disclosure of intellectual capital and the performance of the listing firms. Some authors analyze the effect of non-financial information disclosed in the IPO prospectuses on the performance of a listing firm during the first day of negotiations (underpricing). Nevertheless, the mentioned studies make use of different and generic measure of intellectual capital, thus giving rise to incomparable and controversial results.

Part of the literature supports a positive effects of the IC disclosure on the first day initial returns (Dimovski and Brooks, 2006; Hanley and Hoberg, 2010; Ding 2015). In particular, Dimovski and Brooks (2004 e 2006), making use of data from the Australian IPO market between 1994 and 1999, reveal a negative correlation between the first day returns and the amount of information disclosed

about intellectual capital. In their analysis, the two researchers make use of single intellectual capital elements and focus on the role of the information concerning brands and trademark in reducing information asymmetry. Hanley and Hoberg (2010) analyze a sample of 2112 IPO in the USA between 1996 and 2005, finding evidences that an increase of the informativeness of risk factor disclosure is associated with a more precise price range, a lower price adjustment and a narrow underpricing. Similar non-financial information is considered by Ding (2015) in the Australian IPO market providing additional support of the role of the informative risk factor disclosure in lowering the underpricing.

Different findings are provided by Sing and Van der Zahn (2007) and Cardi and Mazzoli (2015). In particular, Singh e Van Der Zahn (2007) hypothesize a negative relationship between the disclosure of non-financial information and the underpricing. They make use of their own Intellectual Capital Disclosure Index to synthetize six major IC categories applied to the listing prospectuses of a sample of new listing firms in the Singapore stock market. They find that, contrary to their expectations, the intellectual capital disclosure is positively linked to the underpricing and they explain the reported results with theories based on the litigation risk, the benefits connected with potential marketing effects and in the signaling theories. Similar findings are reported by Cardi and Mazzoli (2015) who test the relationship that occurs between intellectual capital disclosure and the performance of the IPO, by separating the effects produced on the price adjustment revealed in primary market and the underpricing observed in the secondary market. They build 6 intellectual capital disclosure indexes and, differently from previous studies, they considered the quality of the IC information that is provided together with its presence into the prospectus. Their results suggest that the IC disclosure in the IPO prospectus is positively linked to the price adjustment: higher IC information influences the bookbuilding in the primary market in terms of an increase of the money raised. In particular, the dimensions of IC disclosure that impacts the way the offer price is fixed are the description of the processes that the firm carries out during its activity and the information and technology. They also find that the IC disclosure in the IPO is positively linked to the underpricing:

despite the increase of the offer price, greater IC disclosure allows for a larger underpricing due to the increase of the market price produced by secondary market investors who are afraid to lose a potential profitable investment. Specifically, they found a positive and significant relationship between the disclosure of research and development and the underpricing in the secondary market. That being so, the evidences that previous studies provide are largely heterogeneous and also inconsistent. To shed light on this point, Cardi, Mazzoli e Severini (2016) investigate if and how the effects of the C disclosure are biased by the different IC classification that is employed. To do so, they develop a content analysis on a sample of Italian IPO prospectuses by considering two different IC classifications and they compare the results in terms of their effects on the IPO results. They find that, despite technical information appears to be the IC category that mostly influences the primary market behavior and communicative information appears to be of most interest to secondary market investors, some specific differences across the models based on the two classification prevent from considering the results are totally reliable.

3. Research Design

3.1 Data and methodology

The aim of this study is show if any reliable causal link exists between the IC information that is disclosed into the IPO prospectus and the behavior of IPO investors in the primary and secondary market. To do so, we disengage from previously proposed IC categorization that could produce biased results and we analyze in depth the single intellectual capital variables that influence the behavior of primary and secondary market investors. In particular, we consider all the IC information that is provided into the listing prospectus of a sample of firms recently listed on Borsa Italiana by considering a series of 87 variables, as suggested by Cordazzo (2007), and we apply a principal component analysis (PCA) to such information in order to let the data freely suggest the most relevant and unbiased IC categories by themselves. The 87 variables suggested by Cordazzo (2008) are specifically created for the Italian context and this makes them suitable for the sample we are considering in this paper. In addition to this, the PCA has to be preferred to the scoring

methods proposed by previous literature as it allows the data to freely suggest the IC components avoiding any biased IC classification.

To establish the number of components to be retained we set the minimum value of eigenvalues>1[1]. In order to ease the interpretation of the factor loadings, a varimax rotation is here used. The orthogonal rotation leads to the observation of the Rotated Component Matrix, which contains coefficients that show the degree of the association between single variables and components, after the rotation. Each variable should have an adequate coefficient in the matrix, corresponding to one single component (we took factor loading between 0.30 and 0.50)[2].

The PCA carried out on the 87 variables suggested by Cordazzo (2007) gives rise to 14 IC components, as reported in table 2 into Appendix 1. Such components are then used as independent variables into two different series of regressions, one on the price adjustment and one on the underpricing, in order to test their effects on the IPO results.

The price adjustment measures the percentage difference between the final offer price and the midpoint of the price range, as illustrated in equation [1] and it is here considered as an expression of the behavior of primary market investors.

$$PA = (OP - MFP) / MFP \qquad [1]$$

where: PA is the price adjustment; OP is the final offer price of the IPO; and MFP is the midpoint of the initial filing price range [(higher price + lower price) / 2].

The model described by equations [2] investigate the effect of IC disclosure on the price adjustment

$$PA = \alpha + \beta IPO + \gamma FIRM + \chi ICC_k + \varepsilon \qquad [2]$$

[1] Many sources recommend mineigen(1), although the justification is complex and uncertain. For a review of the PCA and Factor Analysis methods see Hair et al. (2005).

2 Despite a scientific rule is not established, international practices typically consider a restrictive criterion of loadings equal of greater than 0.5 as significant (Hair et al, 1987). Criteria that are more permissive suggest a minimum required factor loading between 0.30 and 0.50, an adequate factor loading between 0.50 and 0.70 and excellent factor loading over 0.70. After the components rotation some items may not be retained because they do not load on any component with a minimum value or greater, or they cross-loadings on two or more factors (≥ 0,30-0,50). In the case of oblique rotation, the factor loading analysis has to be supported by the analysis of the communality. The communality is the % of variance of one variable explained by the factorial solution, it has to be greater than 0.50-0.60.

The dependent variable is the price adjustment (PA) and independent variables are divided into three groups. The first and second groups (*IPO* and *FIRM*) include a set of the control variables, commonly used in the IPO literature, and they inform about the characteristics of the IPO and of the listing firm, respectively (as described in table 1). The third group of explanatory variables (*ICC)* describes the IC components (see table 1 into appendix 1 for a list of the components and their related variables).

The very same regressions were then re-run using the underpricing (UP) as the dependent variable, measured as the percentage difference between the closing price at the end of the first trading day and the IPO offer price net of the market performance on the same day[3], as described by equation [3] and it is here used as an expression of the behavior of secondary market investors.

$$UP = (MP - OP) / OP \qquad [3]$$

where UP is the underpricing that the listing firm generates by selling shares at a discount on the expected market price net of the market performance on the same day; MP is the first day closing market price; and OP is the final offer price.

$$UP = \alpha + \beta PA + \gamma IPO + \delta FIRM + \chi ICC_k + \varepsilon \qquad [4]$$

The independent variables are the same as described in equation [2]. The PA is added to the UP regression in order to take into account the bookbuilding results, as suggested in previous literature (Hanley, 1993).

Table 1 provides a description of the single control variables included in the *IPO* and *FIRM* categories. Of the IPO characteristics included in the analysis, DUMMY_YEAR is a dummy variable that has a value of 1 for years with a number of IPOs higher than the average number for the whole sample period and that signals hot IPO periods, as suggested by Lowry and Murphy (2007). SIZE is calculated as the number of shares offered in the IPO divided by the number of shares outstanding; we expect it to be negatively related to the price adjustment and also to the

[3] We make use of the FTSE MIB index to calculate the market performance.

underpricing due to the low probability of rationing (Hanley, 1993).

Table 1 – List of control variables

	Variable	Label	Description	Source	Model
IPO	IPO year	DUMMY_YEAR	Dummy variable (value 1 for years with a number of IPOs higher than the average number for the whole sample period)	Universoft	PA & UP
	Size of offer	SIZE	Number of shares offered in the IPO divided by the number of shares outstanding	Universoft	PA & UP
	Underwriter's reputation	UW_REP	Number of IPOs leaded by the underwriter divided by total number of IPOs in the whole sample period	Universoft	PA & UP
	Institutional demand	INST_DEM	Percentage of shares asked by institutional investors divided by the total number of shares asked by retail, institutional and employees investors.	Universoft	PA & UP
	Venture Capital backed	n_VC d_VC	n_VC is the number of venture capitalists involved into the IPO; d_VC is a dummy variable (value 1 if at least one VC is involved into the IPO)	Universoft	PA& UP
	% range	RANGE	Bookbuilding price range divided by the range midpoint	Universoft	PA
	Years of activity	AGE	Number of years the company has been operating in the market	Thomson Datastream	PA& UP
FIRM	Volatility of earnings	CVEARN	Standard deviation of earnings in the three years before the IPO	Universoft	PA
	Return on equity	ROE	Return on equity of the company as an average of the last 3 years	Thomson Datastream	UP
	Debt ratio	DEBT	Debt ratio of the company as an average of the last 3 years	Thomson Datastream	PA& UP
	Technology Based Sector	TECH	Dummy variable (value 1 if the firms belongs to a technology based sector)	Universoft	PA& UP
	Market Share	MRKTSHR	Firm's total assets divided by the sum of total assets for firms belonging to the same industrial sector	Universoft	PA& UP

The reputation of the underwriter (UW_REP) is expected to influence the way the offer price is set: underwriters are rewarded a percentage of the total amount of money raised, so the better their

reputation, the stronger their market power that is the power to price IPOs far from their intrinsic value (Chemmanur and Krishnan, 2012). An underwriter's reputation has also been found to increase first day returns (Carter at al., 1999; Liu and Ritter, 2011). Nevertheless, since national underwriters are excluded from any comprehensive ranking of international underwriters (Boreiko and Lombardo, 2011), as a proxy of each underwriter's reputation, we use the number of IPOs managed by each underwriter by the total number of IPOs issued over the sample period (2004-2014), as suggested by Signori, Meoli and Vismara (2013).

The interest of institutional investors is considered in terms of the demand coming from funds, as a percentage of the total demand coming from retail investors and employees (INST_DEM) (Wyatt, 2014). Finally, we include some variables that inform about the uncertainty surrounding an IPO; in particular, the presence of venture capitalists in the listing firm (d_VC) and their number (n_VC) are likely to produce positive effects on the price adjustment as investors are more willing to accept higher offer prices if the IPO is associated with less uncertainty (Guo et al. 2005). At the same time, the magnitude of the filing price range (RANGE) is expected to be negatively related to the PA; larger filing ranges are usually associated with greater uncertainty in the IPO results (Hanley, 1993).

Moving on to the variables related to the firm's characteristics, we control for the age of the firm (AGE), which has previously been documented to signal the uncertainty of the IPO (Hanley and Hoberg, 2008). Here, we expect AGE to be negatively related to the price adjustment, as mature firms that have been operating in the market for many years may be less appealing in terms of future growth and, as a consequence, their offer price is more likely to be kept low in order to induce investors to negotiate.

We also include a series of control variables that inform about the 'quality' of the listing firm in order to avoid any possible self-selection biases; since it is the issuing firm that decides the type and the amount of IC information it discloses, better quality firms may be more likely to disclose more IC information, as suggested by Barton and Waymire (2004). One of the quality variables we include in the analysis is earnings volatility (CVEARN); CVEARN is calculated as the standard

deviation of earnings over the three years prior to the IPO and it is expected to take on a positive sign; on this purpose the ROE is also considered. The incentive for managers to supply more information increases when the levels of shareholder–debtholder agency conflicts increase. Agency conflicts potentially intensify according to the amount of leverage (DEBT) in the firm's capital structure; we can, therefore, predict that managers of more indebted firms will issue higher quality reports (as in Barton and Waymire, 2004).

Moreover, in accordance with Barton and Waymire (2004), we added a tech dummy (TECH) and the market share (MKTSHR). TECH is a dummy variable that takes on a value of one if the firm belongs to a technology based sector, and MRKSHR is the firm's total assets divided by the sum of total assets for firms belonging to the same industrial sector.

The groups of explanatory variables for the underpricing models ([4]) are almost the same as those used for the price adjustment equations ([2]); only slight differences in the variables can be observed according to the specific dependent variable we are considering.

As multicollinearity represents a huge problem in multivariate regressions, we systematically computed and checked the VIF coefficients in the regression models, and obtained encouraging results.

In order to check or the robustness of our empirical evidences, the regressions above illustrated are then run on a different series of 13 IC components, taken from a second PCA that we carried out on 61 IC variables based on Haniffa, Pike and Li (2008) (see Appendix 2 for a description of the components and their related variables). Results are robust to the test and are illustrated in section 4.

3.2 Association between the IC disclosure and the IPO results: hypotheses development

The first hypothesis that we test deals with the price adjustment as an expression of the consultations that occur in the primary market between the issuer, the underwriter, and the funds that take part in the pre-issue period. In particular we maintain that a larger IC disclosure at this point of the pricing process reduces the uncertainty that funds suffer and also the costs they should stand in order to collect information, according to Sherman and Titman (2002) and Sherman (2005);

this is expected to enable the issuer and the underwriter to keep the offer price relatively high thus generating a positive relationship between the price adjustment and the IC disclosure. More specifically, we hypothesize that the price adjustment is influenced by the IC variables that are more technical and difficult to understand, like the one relative to the human resources, processes and information technology, because primary market investors are supposed to appreciate this information more than secondary market investors. Our first hypothesis is then as follows:

H1: IC information disclosed into the IPO prospectus is positively associated with the price adjustment

Despite the upward revision of the offer price, IC disclosure is expected to produce a sizeable underpricing due to an increase in the market price. Consistent with Singh and Van der Zahn (2007) we hypothesize that an intense IC disclosure induces a potential aggressive bidding up of the market price by unsophisticated secondary market traders who do not want to miss a good opportunity. This hypothesis is also consistent with the literature examining the relationship between share prices and specific intellectual capital indicators (Lev and Sougiannis, 1996; Ballester et al., 2003), which shows that share prices are positively associated with the estimates of R&D assets (Lev and Sougiannis, 1996).

In other terms, what we expect is that a generous IC disclosure enables the issuer to keep the offer price high (thus increasing the amount of money that is raised) but it also drives the market price up, partially producing an opportunity cost in terms of money that are left on the table.

More specifically, we expect that secondary market investors appreciate IC variables that are more communicative and easier to understand, such as those concerning the research and development activity, relationship with customers and firms' strategic alliances. Our second hypothesis is then:

H2: IC information disclosed into the IPO prospectus is positively associated with the underpricing

4. Results

4.1 Descriptive statistics

Below, we present some descriptive statistics about our sample. In particular, table 2 shows how IPOs are distributed across years; the period from 2005 to 2007 represents a hot IPO period, with the number of IPOs higher than the 6.7 average number for the whole sample period (2004-2014).

Table 2 – IPOs by year

Listing Date	N° of firms
2004	7
2005	12
2006	20
2007	23
2008	5
2009	1
2010	2
2011	1
2012	1
2013	2
2014	0
Total number of IPOs	74
Average number of IPOs	6.7

Note: This table presents descriptive statistics of IPOs in the sample by year

Table 3 shows that the largest number of IPOs in the period 2004-2014 took place in the non IC intensive sectors and also for firms that have long been in the market, thus possibly suggesting a fear of young and innovative firms for going public.

Table 3 – Number of IC intensive and non-intensive firms and age of firms in the sample

	Number
IC intensive	25
IC non intensive	49
< 10 years	21
< 25 years	23
> 25 years	30

Note: Firms have here been split into IC intensive sectors (banks, financial sector, health care, media, software components, support service, technological equipment e pharmaceuticals according to Mangena, Pike and Li, 2010) and non-intensive sectors. They have also been categorized into young firms (less than 10 years of activity), mature firms (between 11 and 25 years of activity) and largely mature firms (More than 25 years of activity).

Table 4 splits the sample into firms disclosing above vs below the median amount of IC information and presents univariate tests comparing the level of IC information with the number of years the company has been operating in the market (AGE) and the return on equity of the company (ROE). In particular, the disclosure of IC increases with firm age. This might suggest that firms that have been working in the market for more years are more inclined to inform their stakeholders about their intangible assets in order to compensate for the lower growth perspectives they can offer compared to younger firms. Moreover, better quality firms (as revealed by ROE) tend to disclose more IC information and this suggests the need to include quality variables into the models in order to avoid possible self-selection biases.

Table 4 - Firms disclosing information at above vs below median amounts

Level of IC information disclosed	AGE	ROE
Above median	31.054	21.311
Below median	23.621	19.685

Note: This table presents univariate tests by splitting the sample into firms that disclose information above the median level amount vs firms that disclose below median amount.

4.2 Effects of the IC disclosure on price adjustment and underpricing

After controlling for a set of variables that might explain the price adjustment generated during the pre-issue period, we find that components 3 and 6 (COMP_3 and COMP_6) are those influencing the way the offer price is fixed, as revealed by their positive and significant sign. In particular, component 3 informs about the career opportunities for human resources inside the firm and also about the working environment; component 6 is dedicated to the description of expenses and advantages of information and technology investments (see tables 1 and 3 into appendix 1 for a list of the components and their related variables). The positive sign of the relationships reveals that, as expected in hypothesis 1, when institutional investors have a wide range of IC information available to them for free, they are more willing to accept a higher offer price and this in turn, allows listing

firms to raise more capital. Moreover, as the investors taking part to the primary market are usually investment managers, they particularly appreciate IC variables that describe in deep the way the firms' work, such as information concerning human resources and information technology.

Table 5 – The effects of IC disclosure on the Price Adjustment (PA)

IC	COMP_3		0.011 **
			0.004
	COMP_6	0.014 *	
		0.007	
IPO	DUMMY_YEAR	0.056 ***	0.062 **
		0.019	0.020
	SIZE	0.073	0.071
		0.060	0.064
	UW_REP	0.177 *	0.173 *
		0.105	0.103
	INST_DEM	0.011	0.021
		0.048	0.052
	n_VC	0.010 *	0.011 *
		0.006	0.006
	RANGE	-0.288 **	-0.342 **
		0.142	0.156
FIRM	CVEARN	0.000	0.000
		0.000	0.000
	DEBT	0.000	0.000
		0.000	0.000
	AGE	-0.001	-0.001 **
		0.000	0.000
	TECH	-0.002	0.002
		0.022	0.023
	MKTSHR	0.007	0.030
		0.036	0.041
	const	-0.004	-0.009
		0.049	0.056
	r squared	0.3441	0.3596

Notes: This table contains the multivariate regression results of the price adjustment described in equation [2] (the standard error is the number below the coefficient). ***, ** and * indicates statistical significance at the 1%, 5% and 10% levels respectively. VIF scores are all lower than 2.0.

With reference to the control variables of the IPO characteristics, the DUMMY_YEAR is significant and positive, suggesting that PA tends to be higher during hot IPO periods when the demand coming from investors is likely to increase. The reputation of the underwriter (UW_REP) also significantly and positively influences the price adjustment, as suggested by Hanley and Hoberg (2008). As already largely mentioned in the literature, VC play a certification role in the IPO (Megginson and Weiss, 1991; Hanley and Hoberg, 2008) as an increase in the number of VCs

(n_VC) involved into the IPO enables the listing firm for an upward adjustment of the offer price. We also find evidence of a positive relationship between the percentage range (RANGE) and the price adjustment, according to what previously found by Guo (2005).

As far as FIRM characteristics are concerned, the AGE of the company negatively influences the price adjustment, as expected and according to what already found by Hanley and Hoberg (2008).

Moving on to the determinants of underpricing, the first variable that deserves attention as an explanatory variable is price adjustment (PA). The positive and significant sign of PA on UP indicates that any effects that are revealed on the level of underpricing is linked to what has already occurred during the bookbuilding phase. Moreover, PA is able to explain around the 60% of the underpricing that takes place in the secondary market (see the PA coefficients in table 6). In other words, as largely maintained by previous literature, the price adjustment is a good predictor of the IPO initial return (Hanley, 1993). As far as the core variables are concerned, we find a positive and significant relationship between components 2 and 5 (COMP_2 and COMP_5) and underpricing; such positive relationships suggest that secondary market investors appreciate information concerning research and development activities carried out by the listing firms (COMP_5) and also about its strategic alliances (COMP_2) (see tables 1 and 3 into appendix 1 for a list of the components and their related variables). Both evidences suggest that enhanced disclosure about research and development activities and strategic alliances could encourage secondary market investors to bid up aggressively due to their positive expectations about the firm's creation of future value (Bontis, 2001).

Furthermore investors might be afraid about losing a good opportunity to buy profitable stocks. Thus, we can suggest that the fear of losing the potential value linked to the intellectual capital, should it occur, represents an additional incentive to bid the market price up. This result confirms the findings of previous studies (Amir and Lev, 1996; Ballester et al., 2003; Mangena, Pike and Li, 2010) and indicates that unsophisticated investors react more in response to variables that are easier to understand (such as Research and Development expenses).

Table 6 – The effects of IC disclosure on underpricing

IC	COMP_2	0.016	*		
		0.009			
	COMP_5			0.017	**
				0.006	
IPO	PA	0.506	**	0.581	**
		0.242		0.270	
	DUMMY_YEAR	0.024		0.018	
		0.042		0.045	
	SIZE	-0.046		-0.036	
		0.091		0.093	
	UW_REP	-0.101		-0.188	
		0.176		0.190	
	INST_DEM	-0.100		-0.094	
		0.086		0.089	
	d_VC	0.003		0.003	
		0.034		0.034	
FIRM	ROE	0.000		0.000	
		0.001		0.001	
	DEBT	0.001		0.001	
		0.001		0.001	
	AGE	0.000		0.000	
		0.001		0.001	
	TECH	0.063	*	0.063	*
		0.035		0.036	
	MKTSHR	0.037		0.023	
		0.063		0.062	
	const	0.080		0.100	
		0.089		0.091	
	r squared	0.3462		0.3413	

Notes: This table contains the multivariate regression results of the underpricing described in equation [4] (the standard error is the number below the coefficient). ***, ** and * indicates statistical significance at the 1%, 5% and 10% levels respectively. VIF scores are all lower than 2.0.

As far as the control variables are concerned, the TECH dummy is positively related to the underpricing, according to Barton and Waymire (2004) and Hanley and Hoberg (2008); the absence of a future dividend 'anchor' makes it difficult for investors to induct backward to fundamental values, so investors may substitute towards forecasts of future prices (Hirota and Sunder, 2002; Blanchard and Watson, 1982) and this will be more likely for firms in technology-driven, emerging industries where value depends more on future growth prospects.

4.2 Robustness check

As previously mentioned in section 3, we carried out a robustness check in order to confirm and validate the results we obtained by making use of the principal component analysis applied to the 87 IC variables suggested by Cordazzo (2007). To this extent, we run another series of regressions

based on a different set of IC components revealed by the PCA applied to the 61 IC variables proposed by Haniffa, Pike and Li (2008); the price adjustment and the underpricing are the dependent variables, as already done in the core analysis above described. Our results confirm and validate the empirical evidences previously described. In particular, as far the core variables are concerned, we found a positive and significant correlation between components 4 and 13 (COMP_4 and COMP_13) and the price adjustment (table 7); such a result confirms that the offer price is adjusted upward when information about human resources is disclosed (COMP_13), as already illustrated for the core analysis in this paper (see tables 1 and 3 into appendix 2 for a list of the components and their related variables).

Table 7 – Robustness check for the effects of IC disclosure on the Price Adjustment (PA)

IC	COMP_4	0.016	*		
		0.009			
	COMP_13			0.024	**
				0.010	
IPO	DUMMY_YEAR	0.056	***	0.066	***
		0.020		0.019	
	SIZE	-0.046		-0.042	
		0.052		0.053	
	UW_REP	0.189	*	0.160	
		0.102		0.101	
	INST_DEM	0.061		0.079	**
		0.047		0.043	
	n_VC	0.001		-0.003	
		0.007		0.008	
	RANGE	-0.122		-0.381	**
		0.168		0.200	
FIRM	CVEARN	0.000	***	0.000	***
		0.000		0.000	
	DEBT	0.000		0.000	
		0.000		0.000	
	AGE	0.000		-0.001	
		0.000		0.000	
	TECH	0.025		0.023	
		0.020		0.020	
	MKTSHR	-0.066	*	-0.063	*
		0.038		0.036	
	const	-0.035		0.010	
		0.055		0.057	
	r squared	0.3904		0.4188	

Notes: This table contains the multivariate regression results of the price adjustment described in equation [2] (the standard error is the number below the coefficient). ***, ** and * indicates statistical significance at the 1%, 5% and 10% levels respectively. VIF scores are all lower than 2.0

We also find a positive and significant link between underpricing and COMP_2 (table 8), a result confirming that underpricing increases when information about research and development is revealed, as previously illustrated.

Table 8 – Robustness check for the effects of IC disclosure on the Underpricing (UP)

IC	COMP_2	0.024	*
		0.014	
IPO	PA	0.647	***
		0.188	
	DUMMY_YEAR	0.080	*
		0.041	
	SIZE	-0.002	
		0.069	
	UW_REP	-0.124	
		0.151	
	INST_DEM	0.112	
		0.107	
	d_VC	-0.013	
		0.032	
FIRM	ROE	0.000	
		0.001	
	DEBT	0.001	
		0.001	
	AGE	0.000	
		0.001	
	TECH	-0.023	
		0.029	
	MKTSHR	-0.019	
		0.059	
	const	-0.050	
		0.083	
	r squared	0.4407	

Notes: This table contains the multivariate regression results of the underpricing described in equation [4] (the standard error is the number below the coefficient). ***, ** and * indicates statistical significance at the 1%, 5% and 10% levels respectively. VIF scores are all lower than 2.0

The evidences obtained in the robustness check allow us to definitely contribute to the literature about the effects of the IC disclosure on the short term IPO results by providing unbiased and reliable results; in fact, differently from previous studies which were based on different IC classification or different IC items, in this case we started from the IC variables themselves (without applying any arbitrary classification) and we let the data freely suggest what IC components are significant to the IPO results in the primary and secondary market. Moreover, the robustness check

we carried out enables us to maintain that, no matter the IC variables that are considered (87 or 61 according to the different sources we employed), results do not change.

5. Concluding remarks

Our study contributes to the recent debate regarding the effects that IC disclosure produces in terms of IPO results. Previous studies fail to provide a consistent interpretation of such effects, possibly due to the different classification of Intellectual Capital being employed. This paper aims to shed light on this point by analyzing the effects that unbiased IC information exert on the IPO results. In particular, we disengage from the traditional IC classifications proposed in the literature and we analyze in more depth the single intellectual capital items that influence the behavior of primary and secondary market investors. To do so, we consider all the IC information that is provided into the listing prospectus of a sample of firms recently listed on Borsa Italiana by considering a series of 87 variables, as suggested by Cordazzo (2007) and we apply a principal component analysis to such information in order to let the data freely suggest unbiased IC categories by themselves. We then put the IC components into a series of regressions in order to study their effects on the IPO results. Finally, a robustness check is carried out by testing the same methodology on a series of 61 different IC variables proposed by Haniffa, Pike and Li (2008). Our empirical evidences are robust to the test and show that IC information is largely appreciated by investors in IPOs; in particular, primary market investors are sensitive to information regarding the way firms deal with their human resources while secondary market investors appreciate information about research and development plans together with strategic alliances. Such empirical evidence provides reliable operative recommendation for firms in terms of the IC information that they should disclose in their prospectuses in order to please primary and secondary market investors and the increase the success of the IPO. As previously mentioned, the disclosure of IC information still constitutes a voluntary practice and represents a time consuming and costly effort for firms going public; as such, the awareness about the IC information that are mostly interesting to investors could help such firms to focus their efforts towards a specific disclosure. In fact, it is important for firms to understand that

the disclosure of some of their non-financial information is a critical way to communicate their value to investors and often has a direct effect on their shares value.

Future improvements on this research might deal with the long-run performance of the firms listed on the Borsa Italiana. Such an analysis would enable us to investigate whether the IC information disclosed actually rewards the interests of both primary and secondary market investors in terms of good long-run performance of the shares they bought or, on the contrary, whether the IC information actually disclosed is used by firms as a marketing tool in the short-run.

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APPENDIX 1 – CORDAZZO (2007)

Table 1- Rotated Component Matrix

Variable	Comp1	Comp2	Comp3	Comp4	Comp5	Comp6	Comp7	Comp8	Comp9	Comp10	Comp11	Comp12	Comp13	Comp14	Unexplained
v1	-0.0412	-0.0346	0.0261	-0.0304	0.0186	-0.0077	0.5775	-0.0324	-0.0784	-0.0561	-0.0218	-0.1131	-0.0812	-0.0403	.1967
v2	0.3832	0.0171	-0.0513	0.0533	0.1241	-0.0152	0.2597	0.0132	-0.0721	0.0307	0.0142	0.1221	0.0410	-0.0408	.139
v3	0.0042	0.0084	0.0482	-0.0030	-0.0617	0.0162	0.5780	-0.0152	0.0499	0.0701	-0.0205	-0.1079	-0.0036	0.0534	.1803
v4	0.4903	-0.0269	0.0360	-0.0044	0.0086	0.0037	-0.0477	0.0212	0.0101	0.0174	-0.0452	-0.0417	-0.0122	0.0188	.1018
v5	0.5142	-0.0105	0.0013	-0.0075	-0.0027	-0.0164	-0.0410	-0.0753	0.0361	-0.0674	-0.0259	-0.0414	-0.0579	-0.0525	.09889
v6	0.4927	0.0345	0.0343	0.0178	-0.0322	-0.0508	-0.0401	0.0059	0.0195	-0.0021	0.0630	-0.0035	0.0237	0.0639	.09424
v7	-0.0094	0.0442	-0.1345	0.0436	-0.0145	-0.0172	0.4721	0.0679	0.0738	-0.0425	0.0553	0.2780	0.0674	-0.0503	.2427
v19	-0.0292	-0.1454	-0.0529	-0.1388	0.0617	0.0407	-0.0333	-0.1403	-0.0169	-0.1511	0.2712	0.3796	-0.1562	0.1492	.2259
v20	0.0454	-0.0002	0.5501	-0.0296	-0.0321	0.0519	-0.0145	-0.0201	-0.1020	0.0533	0.0147	0.0734	-0.0286	0.0106	.151
v21	0.1201	0.0222	0.4435	-0.0783	-0.0147	0.1153	-0.0197	0.0253	-0.0447	0.0345	0.1138	-0.0196	0.0558	-0.0579	.2305
v22	0.0083	-0.0822	0.1447	0.0856	-0.0701	-0.0012	0.0190	0.0102	-0.1217	0.0823	0.6221	-0.1262	0.0755	0.0879	.2285
v23	-0.0110	0.1373	-0.1251	-0.0177	0.0592	-0.0214	-0.0265	0.0358	0.1385	-0.0792	0.6102	0.0296	-0.0511	-0.2111	.1857
v25	-0.0113	0.0669	0.0335	0.0542	-0.0116	-0.0724	-0.0602	0.0369	0.0080	0.0234	-0.0972	0.6771	0.1161	0.0140	.2255
v28	0.0912	-0.0135	-0.0004	-0.3328	0.1824	0.0060	0.0492	0.4341	0.0708	0.0126	0.0393	0.0624	0.1329	0.2256	.2878
v34	-0.0019	0.0711	0.0031	0.0448	-0.1128	-0.0452	-0.0141	0.0152	-0.0397	0.0649	-0.0603	0.0356	-0.0649	0.7125	.2586
v39	-0.1062	0.1386	-0.0363	-0.0429	-0.0938	-0.1764	-0.0052	0.4780	-0.1323	0.0204	0.0005	-0.0481	-0.1120	-0.2725	.3492
v42	-0.0148	-0.0811	-0.0805	0.0881	-0.0038	-0.0379	-0.1063	0.4708	0.1405	-0.0651	0.0991	-0.0426	-0.1140	0.0857	.3201
v46	-0.0954	0.0489	0.0475	0.0363	0.1437	0.5158	-0.0067	-0.0184	-0.0014	0.0027	-0.0434	-0.0373	0.0504	-0.0227	.1438
v48	-0.0124	-0.1030	0.1394	0.1482	0.0231	0.2391	0.0531	0.4650	-0.1203	0.0730	-0.0443	0.1077	0.0666	0.0621	.2035
v49	-0.0423	0.0201	0.0522	-0.0339	-0.0424	0.5606	0.0040	-0.0730	0.0672	0.0096	0.0416	-0.0736	0.0771	-0.0515	.1606
v50	0.1475	0.0483	-0.1471	0.0176	-0.1899	0.4360	-0.0077	0.1844	0.0058	-0.0566	-0.0619	-0.0231	-0.1343	-0.0238	.1221
v52	-0.0750	0.0111	0.4043	0.0289	0.1067	-0.1992	0.0352	0.0553	0.2831	-0.1310	-0.2082	-0.0160	0.0136	-0.0082	.2778
v57	-0.1071	0.0404	0.4094	0.1170	0.0104	-0.0275	0.0288	-0.0217	0.0760	-0.1899	0.0509	-0.0113	-0.1391	0.0084	.2989
v58	-0.0451	0.0224	0.0607	0.0012	-0.0864	-0.0337	0.0485	0.0017	0.6012	0.1637	0.1450	-0.0015	0.1296	0.1069	.1965
v61	-0.0336	-0.0439	-0.0345	-0.1017	0.0554	0.0770	0.0067	0.0372	0.0833	0.6202	0.0009	0.1038	-0.1231	0.0741	.3124
v62	0.0088	0.0294	0.0011	0.0200	0.5942	-0.0074	-0.0210	0.0109	-0.0451	0.0396	-0.0099	-0.0172	-0.0011	-0.0758	.05909
v63	0.0088	0.0294	0.0011	0.0200	0.5942	-0.0074	-0.0210	0.0109	-0.0451	0.0396	-0.0099	-0.0172	-0.0011	-0.0758	.05909
v65	0.0159	0.0033	-0.0497	0.4722	0.0698	-0.0579	0.0424	0.0478	0.0718	-0.1632	0.0465	-0.0163	0.0573	0.0553	.2054
v66	0.0432	-0.0186	0.0441	0.5634	-0.0308	-0.0010	-0.0179	0.0046	0.0059	0.0817	0.0846	0.0705	-0.0229	0.0234	.1464
v67	-0.0395	-0.0593	-0.0694	0.4183	0.1804	0.1278	-0.0065	0.0024	0.0154	-0.0292	-0.0561	0.0464	-0.0887	0.1011	.2668
v69	0.0047	0.0549	-0.0187	0.1175	0.0823	-0.1421	-0.0157	-0.0228	0.0395	0.5254	0.0152	-0.2810	0.1124	0.0386	.1936
v71	-0.0071	0.5427	0.0773	-0.0623	0.0421	0.0115	0.0091	0.0501	0.0699	-0.0402	0.0111	0.0205	-0.0444	0.0226	.06161
v72	0.0403	0.5367	0.0305	-0.0336	0.0093	0.0152	-0.0171	0.0520	0.0452	-0.0299	0.0144	0.0239	-0.0518	0.0009	.09611
v73	-0.0346	0.5101	-0.0917	0.0632	0.0259	0.0667	0.0106	-0.1855	-0.1217	0.0633	0.0332	0.0523	0.0248	0.1612	.1294
v80	0.0728	-0.0127	-0.0887	0.0263	-0.0067	0.0969	-0.0453	-0.0314	0.6033	-0.0388	-0.1259	0.0048	-0.0946	-0.1528	.2111
v84	0.0182	0.1722	-0.0357	0.1692	-0.2042	-0.0705	-0.0529	0.1175	-0.1033	-0.0344	-0.0929	-0.1005	0.5194	-0.1408	.2675
v86	-0.0210	-0.1030	-0.0080	-0.0898	0.0761	0.0632	-0.0039	-0.0687	0.0616	-0.0392	0.0508	0.1150	0.6939	0.0131	.2172
v87	-0.0235	0.0048	-0.1010	-0.0939	0.1680	0.0070	0.0083	0.0489	0.0619	-0.3707	0.0300	-0.3184	0.1150	0.3801	.2906

Table 2 - Cumulative explained Variance

Principal components/correlation — Number of obs = 72
Number of comp. = 14
Trace = 38
Rotation: orthogonal varimax (Kaiser off) — Rho = 0.8043

Component	Variance	Difference	Proportion	Cumulative
Comp1	3.55311	.739171	0.0935	0.0935
Comp2	2.81394	.166169	0.0741	0.1676
Comp3	2.64777	.10515	0.0697	0.2372
Comp4	2.54262	.0053443	0.0669	0.3041
Comp5	2.53728	.0845256	0.0668	0.3709
Comp6	2.45275	.156983	0.0645	0.4355
Comp7	2.29577	.186882	0.0604	0.4959
Comp8	2.10889	.191991	0.0555	0.5514
Comp9	1.9169	.250681	0.0504	0.6018
Comp10	1.66621	.027287	0.0438	0.6457
Comp11	1.63893	.0166213	0.0431	0.6888
Comp12	1.62231	.177596	0.0427	0.7315
Comp13	1.44471	.122082	0.0380	0.7695
Comp14	1.32263	.	0.0348	0.8043

Table 3 –IC variables in Cordazzo (2007)

A) Dimension of human resources

1 Staff breakdown by age
2 Seniority
3 Staff breakdown by sex
4 Nationality
5 Staff breakdown by department
6 Staff breakdown by functions
7 Education
8 Employees' turnover
9 Comments on turnover
10 Employees' health and work safety
11 Work absences
12 Interviews
13 Development of competencies
14 Programs and plans on competencies
15 Training costs
16 Employees' training costs
17 Employees' general costs
18 Recruitment programs
19 HRM departments and functions
20 Working shifts
21 Carriers
22 Organisational incentives and bonus
23 Pensions plan
24 Insurance
25 Description of key employees
26 Revenues on employees
27 Value added on employees
28 Trade unions organisations
29 Number of employees by country

B) Dimension of customers

30 Number of customers
31 Sales by customers
32 Sales by products
33 Customers' geographical breakdown alliances
34 Description of key clients
35 Description of customers participation
36 Description of relationship with customers
37 Customers' education/ training
38 Customers on employees
39 Value added on customers
40 Products breakdown
41 Products breakdown on customers
42 Products breakdown by country
43 Buying backs
44 Competitors
45 Contacts

C) Dimension of information technology

46 IT investments
47 IT systems
48 Software
49 IT benefits
50 IT costs

D) Dimension of processes

51 Internal communication system
52 Working environment system
53 Online working
54 Internal information and knowledge
55 External information and knowledge
56 Measurement of internal and external risk
57 Social programs and plans
58 Environmental programs, plans and certification

E) Dimension of R&D

59 R&D plans, programs, strategies
60 R&D costs
61 R&D costs on sales
62 First stage of R&D
63 Development stage of R&D
64 R&D prospects
65 Patents
66 Numbers of patents and licenses
67 Outstanding patents
68 Marks

F) Dimension of strategy

69 Description of the new production technology
70 Quality of firm performance
71 Strategic alliances
72 Objectives and reasons of strategic alliances
73 Comments on the consequences of strategic alianc
74 Supply and distribution system
75 Firm image and mark
76 Firm culture
77 Best practices
78 Organisational structure
79 Use of energy, raw materials, and other goods
80 Environmental investments
81 Community participation
82 Social responsibility
83 Employees' contracts
84 Sector analysis
85 Financial ratios analysis
86 Suppliers and financial control
87 Future plans and strategies

APPENDIX 2 – HANIFFA, PIKE AND LI (2008)

Table 1- Rotated Component Matrix

Variable	Comp1	Comp2	Comp3	Comp4	Comp5	Comp6	Comp7	Comp8	Comp9	Comp10	Comp11	Comp12	Comp13	Unexplained
v2	-0.0364	0.0088	0.0557	-0.0549	-0.1031	-0.0232	0.0282	0.0304	0.0818	-0.0249	0.7328	-0.0359	-0.0489	.1742
v5	0.0354	0.0037	-0.0400	-0.0583	-0.0494	0.0258	-0.1054	0.7211	-0.0204	0.0137	0.0075	0.0840	-0.0557	.1816
v6	-0.0323	0.0234	0.1679	-0.4324	0.1230	0.4132	-0.0657	0.1082	-0.3110	0.1431	0.1093	0.1089	0.1259	.1907
v8	-0.1943	0.4948	0.0347	0.0936	0.0743	0.2887	-0.0135	0.0859	0.0386	-0.0245	0.0341	-0.0418	-0.1259	.349
v11	-0.0678	0.0947	-0.0057	0.4988	-0.0304	0.1600	0.1195	-0.1284	-0.1674	-0.1922	0.0838	-0.0101	0.1473	.2605
v16	-0.0315	-0.0279	0.0360	0.0031	-0.0071	0.0143	-0.0288	-0.0517	-0.0563	0.7109	0.0059	-0.0704	-0.0083	.1991
v17	0.5374	-0.2306	0.0232	0.0730	-0.0787	0.1073	-0.0179	0.1464	-0.0141	-0.0444	0.0019	0.0082	0.0584	.32
v19	0.0045	0.0065	0.0683	0.0103	-0.0571	0.0630	0.1115	0.0854	0.0858	-0.1017	-0.0287	0.7145	0.0563	.1861
v20	0.1179	0.0113	0.4287	-0.0787	0.1604	0.0146	-0.1906	-0.1520	0.0573	-0.4032	-0.0352	0.0612	-0.1033	.1859
v21	0.0298	0.0051	-0.0504	0.0430	-0.0356	0.6918	0.0721	-0.0376	0.0638	-0.0297	-0.0167	0.0398	-0.0546	.2072
v22	-0.0462	-0.0127	-0.0064	-0.0616	0.0152	0.0385	0.0125	-0.0297	0.7427	-0.0375	0.0776	0.0785	0.0064	.1368
v23	0.1679	0.4487	-0.0549	0.0075	-0.0812	0.0410	-0.1750	-0.0620	0.0170	-0.1393	0.0939	-0.3219	0.0594	.2494
v24	0.2946	0.2850	0.1543	-0.0242	0.0795	-0.0934	0.1209	0.0469	0.2999	0.3671	-0.0495	-0.0008	0.0200	.1856
v27	-0.0503	0.1253	-0.0240	0.0119	0.6618	0.0310	0.0497	0.0015	0.0076	-0.0240	-0.0975	-0.0370	0.0566	.2659
v29	0.5241	0.0912	0.0869	-0.0386	0.0240	-0.1073	0.2062	-0.0255	-0.0835	-0.0611	0.0504	-0.0552	-0.1910	.2192
v30	0.2133	-0.0332	-0.1316	0.0916	0.2437	0.1306	-0.0353	-0.0120	-0.0153	0.0832	0.4891	-0.0135	0.1448	.2466
v31	0.0917	0.1227	-0.0880	0.0562	0.1241	-0.2193	0.0847	0.4076	-0.2185	-0.1681	0.0486	0.0442	0.0732	.2231
v35	-0.0250	0.1963	0.0083	-0.2705	-0.3123	-0.1695	0.0768	-0.2079	-0.1564	-0.0805	0.1187	0.0457	0.2512	.4364
v36	-0.0450	0.5116	0.0201	-0.0707	0.0664	-0.1738	0.0935	0.0073	-0.0975	0.0631	-0.1021	0.1928	-0.0286	.3367
v39	0.0527	0.0849	0.5923	0.1663	-0.0848	-0.0733	-0.2021	-0.0201	0.0393	0.1270	0.0949	0.2022	0.1100	.1637
v41	0.1174	0.0110	-0.2781	-0.0894	0.1746	0.0046	-0.3431	-0.1457	0.0433	0.0161	-0.0967	0.2618	0.0525	.2732
v44	0.0336	-0.0290	0.1235	0.6089	0.0454	-0.0010	-0.0676	0.0246	-0.1003	0.1594	-0.0455	0.0606	-0.0053	.186
v45	0.3361	0.0734	-0.2091	-0.0430	-0.0645	0.0798	-0.1536	-0.3380	-0.2084	0.0790	-0.0630	0.2317	-0.1245	.2387
v47	0.0621	0.0044	-0.0872	0.0012	0.0370	0.0415	0.7491	-0.0827	0.0315	0.0127	0.0107	0.1199	0.0218	.1571
v48	0.0465	0.1511	-0.4641	0.1493	-0.0415	-0.0983	-0.2296	0.0380	0.1571	0.0079	0.1260	0.1910	0.0631	.3212
v53	-0.0479	-0.0328	0.0165	0.0168	0.0433	-0.0378	0.0099	-0.0327	-0.0117	0.0156	0.0002	0.0495	0.7851	.1768
v59	0.0139	-0.1690	0.0429	-0.0781	0.4957	-0.1648	0.0017	-0.1043	-0.0142	-0.0320	0.1277	-0.0333	0.0154	.3449
v61	0.2435	0.0472	0.0135	-0.0543	-0.0768	0.1564	0.0031	0.1172	0.1867	-0.0701	-0.2971	-0.2832	0.3681	.2505

Table 2 - Cumulative explained Variance (Robustness test)

Principal components/correlation — Number of obs = 71

Number of comp. = 13

Trace = 28

Rotation: orthogonal varimax (Kaiser off) — Rho = 0.7619

Component	Variance	Difference	Proportion	Cumulative
Comp1	2.06954	.14919	0.0739	0.0739
Comp2	1.92035	.0579133	0.0686	0.1425
Comp3	1.86243	.0488693	0.0665	0.2090
Comp4	1.81356	.0974893	0.0648	0.2738
Comp5	1.71607	.150614	0.0613	0.3351
Comp6	1.56546	.0171276	0.0559	0.3910
Comp7	1.54833	.00108838	0.0553	0.4463
Comp8	1.54725	.0293032	0.0553	0.5015
Comp9	1.51794	.000372688	0.0542	0.5557
Comp10	1.51757	.0189941	0.0542	0.6099
Comp11	1.49858	.0357625	0.0535	0.6635
Comp12	1.46281	.168767	0.0522	0.7157
Comp13	1.29405	.	0.0462	0.7619

Table 3 – IC variables in Haniffa, Pike and Li (2008)

A) Structural Capital

1 Intellectual property
2 Process
3 Management philosophy
4 Corporate or organisational culture
5 Organisational flexibility/adaptability
6 Organisational structure
7 Organisational learning
8 Research and development
9 Innovation
10 Technology
11 Financial relations
12 Customer support function
13 Knowledge-based infrastructure
14 Quality management and improvement
15 Accreditations
16 Overall infrastructure/capability
17 Networking
18 Distribution network

B) Relational Capital

19 Customers
20 Market presence
21 Customer relationships
22 Customer acquisition
23 Customer retention
24 Customer training and education
25 Customer involvement
26 Company image/ reputation
27 Company awards
28 Public relations
29 Diffusion and networking
30 Brands
31 Distribution channels
32 Relationship with suppliers
33 Business collaborations
34 Business agreements
35 Favourable contracts
36 Research collaborations
37 Marketing
38 Relationship with stakeholders
39 Market leadership

C) Human Capital

40 Number of employees
41 Employees age
42 Employee diversity
43 Employee equality
44 Employee relationship
45 Employee education
46 Skills/know-how/expertise/knowledge
47 Employee work-related competences
48 Employee work-related knowledge
49 Employee attitudes/ behaviour
50 Employee commitments
51 Employee motivation
52 Employee productivity
53 Employee training
54 Vocational qualification
55 Employee development
56 Employee flexibility
57 Entrepreneurial spirit
58 Employee capabilities
59 Employee teamwork
60 Employee involvement with community
61 Other employee features