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# Impairment of intangible assets and disclosure by Italian banks

Anna Grazia Quaranta
*Dipartimento di Economia e Diritto, Università degli Studi di Macerata, Macerata, Italy*
Nico Di Gabriele
*Directorate General Micro-Prudential Supervison 2, European Central Bank, Frankfurt, Germany, and*
Ermanno Zigiotti
*Dipartimento di Economia e Diritto, Università degli Studi di Macerata, Macerata, Italy*

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## Abstract

**Purpose** – The purpose of this paper is to examine the methods used to perform impairment test for intangible assets from a business combination and the information provided by the consolidated financial statements of a Group of Italian banks in the period 2009-2014. The purpose is to verify if, as assumed in literature, there is a positive link between profitability and the tendency of manager's to post the impairment losses of intangible assets promptly and accurately.

**Design/methodology/approach** – The existence of a link between profitability and the quality of disclosure was verified by constructing correlation indices, and then ascertaining not only the reliability but also the strength and direction of the statistical connection between the above two aspects. A multivariate linear regression reconfirmed the results obtained by the previous bivariate analysis.

**Findings** – The results confirm the basic assumption, showing that the link between the aspects considered is statistically significant and positive in all the years in question.

**Originality/value** – This study fills a gap, given that no papers were found in literature specifically pertaining to banks and other financial institutions. Moreover, the decision to focus the study on Italian banks seems to be particularly appropriate for a number of different reasons: before the financial crisis, Italian banks made numerous acquisitions, posting high amounts for intangible assets; the financial crisis made the stock market prices plummet, thus making it necessary to write-off intangible assets from business combinations; and even before the ESMA, the Bank of Italy intervened on several occasions on the question of reporting, urging Italian banks to comply with disclosure requirements and impairment criteria.

**Keywords** Disclosure, Banking sector, Intangible assets, Impairment test, Multivariate analyses

**Paper type** Research paper

## 1. Introduction

The valuation of intangible assets and the annual impairment test required by accounting standards for intangible assets with indefinite useful life, is a very important in terms of assessing the quality of financial statements.

This is a two-step process in which the assessment of the recoverable value of the cash generating units (CGUs) is of crucial importance; this assessment entails a complex economic calculation based on quantitative variables (expected cash flows, discount rate, growth rates of the cash flows to estimate the terminal value) and business policies (scope of the CGU and allocation of intangibles to one or more CGUs), that may be very subjective and thus difficult to monitor.

This means that the impairment process lends itself to the risk of opportunistic actions by whoever draws up the financial statements, given that they are indeed in a position to manipulate these variables and forecasts, in order to attain objectives different to those established by standard setters.

Many articles have been written on this aspect under the far-reaching research field of the accounting quality of financial statements (Dechow *et al.*, 2010), which examined the

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many reasons that may induce preparers to abuse the subjectivity they are allowed when performing the impairment test. According to these studies, the main reasons include: earnings management policies (timing and amounts of write-offs; information on the quantitative variables used in the impairment process), supporting stock market prices in order to attain personal benefits (economic incentives and reputation).

In recent years, the Italian standard-setter (Italian Standard Setter – OIC, 2009, 2011), the National supervisory authorities (Bank of Italy, Consob, ISVAP, 2009, 2010) and the European market regulator (European Securities and Market Authority, 2013) have all called attention to the importance of this matter, asking preparers of financial statements to apply the accounting standard rules on impairment tests more strictly.

After the 2008 financial crisis which reduced the enterprise value, making write-downs of intangible assets due to acquisitions more probable, it became necessary to perform an empirical analysis on the financial statements of Italian banks in the period 2009/2014 to monitor different aspects such as the impairment policies used, compliance with applicable accounting standards and the quality of the financial statements submitted to stakeholders.

The decision to focus on Italian banks was made for several reasons: in the years prior to the financial crisis, Italian banks made numerous acquisitions, posting significant intangible assets; the financial crisis caused the stock market prices to plummet, making it necessary to write-off the intangible assets of business combinations; and no specific paper has even been published on banks and other financial institutions, so that this study fills a gap; other articles published to date tend to study different industries and countries (above all, manufacturing in the USA).

Moreover, our study focussed on Italian banks, given that the reporting obligation required by IAS/IFRS standards is in addition to that of directive 262/2005 of the Bank of Italy, which imposes predefined and very detailed reporting schemes, meaning that the financial statements of Italian banks provide much more information than the financial statements of other EU banks (or other non-financial companies). Even before the ESMA, the Bank of Italy has more than once raised the question of reporting adequacy, urging Italian banks to comply with disclosure requirements and impairment criteria.

An empirical research on Italian banks is therefore considered to be of great interest, in order to verify if a more prescriptive regulatory framework may indeed improve disclosure and ensure the fairness of the impairment process.

Our study verifies the existence of a link between profitability and the quality of disclosure, in order to ascertain not only the validity but even the strength and direction of the statistical link between the above two aspects. The results of the study confirm the basic assumptions reached in literature, even in the banking sector.

This paper is structured as follows: paragraph two reviews existing literature; paragraph three defines our research assumption, giving a description of the group of banks studied and introduces the methodology used for the empirical analysis of the data, which is then reported by paragraph four together with the results. The conclusions of the paper are given in paragraph 5.

## 2. Literature review

Many accounting studies analyse the valuation of intangible assets and impairment test, in order to examine aspects that are of interest to users of financial statements (Quagli, 2011).

After outlining their research assumption according to existing literature, these studies generally describe empirical studies with statistical quantitative tools, on samples of Italian or cross-country companies, in order to test the behaviour of financial statement preparers. Using the results of these studies, the authors put forward opinions on the accounting practices used and make suggestions to standard setters in order to improve regulations and ensure the use of best practices.

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The issues mainly discussed are the following:

(1) the greater significance of IAS/IFRS compliant financial statements with respect to previous standards, given that intangible assets with an indefinite useful life (i.e. goodwill) cannot be amortised and the obligation of performing an annual impairment test;

(2) the strict application of the numerous accounting rules, in order to ascertain compliance with the requirements of standard setters and the need for enforcement;

(3) whether the data provided by financial statements on the valuation of intangible assets with indefinite useful life are reliable, and whether this information may be used by users (investors, financial analysts) when making decisions;

(4) the role of the private benefits of managers in the unfair application of accounting rules on impairment tests, pointing out the risks of opportunistic actions whose scope is to prevent or delay posting of losses from write-offs; and

(5) the value relevance of the intangible assets posted in the financial statements to determine the correlation with the market prices of enterprises.

A first field of research examined the general reasons for posting write-offs after a reduction of the economic value of a company (i.e. reduced expected cash flows and/or drop of the stock market prices), substantially confirming that the work of the preparers was correct (Henning *et al.*, 2004; Chalmers *et al.*, 2008; Godfrey and Koh, 2009; Jarva, 2009; Chalmers *et al.*, 2011; Chalmers *et al.*, 2012; Knauer and Wöhrmann, 2016).

These studies support the view that the introduction of new standards on impairment tests for intangible assets with indefinite useful life (and the fact that these cannot be amortised annually), has improved the significance of financial statements, ensuring a closer correlation between book values and economic values, while providing more useful information to investors on the actual economic performance of the company.

According to this line of thought, therefore, there are no real risks of opportunistic actions by the management, given that the empirical tests conducted confirm that the write-offs of goodwill are associated, at least tangentially, to reduced cash flows, as required by standards setters.

Other authors have reached exactly the opposite conclusion, maintaining that the impairment test lends itself to manipulation by preparers for many reasons, whether these are to prevent, reduce or delay the recognition of losses.

These authors believe that this valuation procedure must be examined very critically by those who use financial statements and, in the opinion of some, that regulations should be introduced by standard setters to prevent opportunistic action (Francis *et al.*, 1996; Watts, 2003; Beatty and Weber, 2006; Ramanna, 2008; Comiskey and Mulford, 2010; Carlin and Finch, 2010, 2011; Ramanna and Watts, 2012; Ji, 2013; Avallone and Quagli, 2015).

These authors have examined the main economic variables on which the quantitative calculation of the value in use (expected cash flows, discount rates, growth rates) are based, starting from the assumption that such amounts are: very subjective; and cannot be verified by external observers. They went on to carry out empirical tests to ascertain, *ex post*, the methodological consistency between the basic assumptions and the reliability of the quantitative estimates of managers. All this is very difficult to investigate given that these variables (above all the expected cash flows) are not known, nor may they be verified by an external observer because they are indeed confidential. This raises a typically asymmetric information problem, given that the confidential information used by managers to perform the impairment test cannot be verified, *ex post*, by the users of financial statements.

Ramanna and Watts (2012) documented a common management strategy to prevent/delay write-offs in a sample of US companies that showed a sharp drop in stock market prices,

indicating a potential impairment. The authors also pointed out that the managers in question put these opportunistic actions into practice specifically to increase their fees, protect their professional reputation and prevent breach of debt covenants.

Avallone and Quagli (2015) identify an important relationship between expected cash flows (estimated via the Price-to-Book value) and impairment losses; they nevertheless identify a strong correlation between the (over)estimation of the growth rate of expected cash flows and failure to/delayed recognition of write-offs, pointing out that results may potentially be manipulated by managers by overestimating the growth rate. According to the authors, the decision to recognise a write-down from the impairment tests and quantitative calculation show a negative correlation with profitability (measured through the return on assets) and a positive correlation with the book value of the goodwill.

Finally, Hayn and Hughes (2006) ascertained that managers often change the quantitative values of the variables used to calculate the recoverable values from one financial year to the next, using this expedient to manipulate the results in order to prevent (postpone) the write down of the goodwill that would otherwise be necessary.

But even before calculating the quantitative value of these variables, the question is whether or not the management allocates goodwill to one or more CGUs: this is very subjective, and at the sole discretion of the preparer.

Particularly worthy of note is the paper by Watts (2003) who points out that it is difficult for stakeholders to verify the market value of CGUs because often these are not listed (company divisions by product/market, business line, etc.). Wines *et al.* (2007) report the opportunistic tendency of companies to allocate goodwill to CGUs with a broad scope (groups of CGUs or even a general entity) in order to offset the positive and negative results generated by acquisitions, thus minimising write-offs. In the sample they examined, Carlin and Finch (2010) ascertained that many did not comply with disclosure obligation required by standard setters to allocate goodwill to each CGU. Shalev (2009) pointed out the critical aspects and (potential) manipulation of the procedure used to allocate the purchase price that, depending on the choices made by managers, residually produces the portion of the price allocated to goodwill and other intangible assets, and has a definite impact on the income statement in terms of expected profitability (constant charges for systematic amortisation vs random write-downs for impairment).

Another field of research has investigated the relationship between impairment policies and the "private benefits" of managers according to the agency theory, describing the main economic (variable fees, stock options, etc.) and reputational reasons for which managers will delay the disclosure of write-offs.

Given that the value in use is estimated above all on the basis of confidential information not available to the public, it is very difficult for stakeholders to assert, *ex post*, that the parameters estimated by managers were optimistic, and managers may consequently claim that unforeseen circumstances occurred to justify their previous (over)estimation.

According to this school of thought (Elliott and Shaw, 1988; Francis *et al.*, 1996; Gu and Lev, 2011), there is a significant relationship between untimely write-offs and the long tenure of directors, given that acquisitions with high goodwill value were made by managers who (then) had to write them off.

In particular, Gu and Lev (2011) found proof of the fact that most of the goodwill impairment, for high amounts, that was amortised over the years in an opportunistic manner by managers, was due specifically to the excessively high prices paid for acquisitions made (by the same managers) in previous years, and because the external growth strategy through M&A had produced high write-offs.

Similar conclusions were also reached by other authors who point out the delay with which write-downs are posted is directly related to the economic incentives paid to managers.

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Beatty and Weber (2006) confirmed that the induced distortion in the valuation of goodwill indicates a strong link between the remuneration policies of managers and profits, stock market prices and the launching of stock option plans. Muller *et al.* (2012) report cases of managers who disclose confidential information about the negative economic outlook of a company – not yet communicated to the market and failure to write-off the goodwill – in order to obtain personal economic benefits (trading on company shares).

In line with this school of thought, the link between stock market prices and accounting policies on impairment was also investigated, confirming the negative impact of write-offs on risk preferences of investors; managers tended to avoid/delay impairment in order to support share prices so as to hide from the market any signs of weakening of the company's performance (Dahmash *et al.*, 2009; Hamberg *et al.*, 2011; Li *et al.*, 2011).

Other studies pointed out the association between write-offs and management turnover (Riedl, 2004; Vanza *et al.*, 2011), on the assumption that new managers might wish to substantially clean up the balance sheet by writing off the assets in such a way as to lower the capital base on which their (future) performance is based.

Following this line of research, numerous papers have been written on big bath accounting (Chenheiter and Melumad, 2002; Jordan and Clarck, 2004) according to which the timing of the write-offs is open to opportunistic manipulation by the management, further compounding the loss in a given financial year (whose performance is negative), above all to improve the comparison of the results with subsequent years, often in association with a change of management.

Many studies report other opportunistic reasons for which specific impairment policies are used, including the need to: reassure lenders while preventing breach of debt covenants (De Fond and Jiambalvo, 1994; Beatty and Weber, 2006); support operating results in businesses with high financial leverage (Cotter *et al.*, 1998); and attenuate the natural fluctuations of financial results by posting write-offs in the most profitable financial years, according to an income smoothing logic.

Another field of research focussed on disclosure requirements, intended as the reliability, completeness and transparency (narrative and quantitative data) of the information provided by managers on impairment tests and the valuation of intangible assets.

This is certainly a crucial issue, which ultimately leads to an overall assessment of the best information provided by an impairment-based system – whose annual assessment is at the discretion of preparers who use private information that cannot be checked by stakeholders – with respect to the previous standards based on the systematic amortisation of goodwill and other intangibles.

The quality and extent of data presented in the reports attached to financial statements according to accounting standards, should include full details of what the managers have done (accountability), so as to allow stakeholders to assess, *ex post*, the effectiveness of their work. Given that the managers use in-house data however, including forecasts and estimates that are mostly unknown to the public (and therefore cannot be checked by stakeholders) to perform impairment tests, correct disclosure is extremely importance in terms of providing all the tools the market requires to evaluate what managers have done.

Analysing a sample of companies listed on European markets, and in part confirming the findings of other papers, Castellano *et al.* (2015) reported that the best disclosure in terms of goodwill went hand in hand with : high outstanding stock market shares, listings on several organised markets (multi-listing), the size of the business, efficient audits and numerous CGUs, while high ownership concentration levels, a low level of debt (leverage) and trading on a single market (mono-listing) often went hand in hand with medium-low quality levels of information disclosure.

Other authors place particular importance on the size of a company (Lang and Lundholm, 1993), with findings that show a positive link between the size of the business

and the quality of disclosure. Armitage and Marston (2008) for example, reported the positive effects of better disclosure in terms of reducing the cost of capital. The findings of Verriest and Gaeremynch (2009) show that (better) corporate governance, intended as the number of independent directors on the board, has a very positive effect on disclosure. Finally, these authors report that firms with better performance and a less concentrated ownership base (presence of stakeholders not associated to the control group), tend to write-off goodwill in a more consistent and timely manner.

## 3. Defining the research assumption, selecting the banks used for the study and description of the method used for the empirical analysis

After reviewing existing literature, and despite the somewhat contradictory conclusions reached by doctrine as regards the accounting treatment of intangible assets and the impairment test, we consider that it is reasonable to assume that the best-performing companies provide information of higher quality to the market (very detailed analysis and quantitative data; complete information).

The papers reviewed make it fair to suppose that there is a positive link between income-based performance and the management's willingness to recognise the impairment of intangible assets; there is nevertheless still a high risk of opportunistic actions when performing the impairment test, above all in the case of companies with intangible assets that are higher than the equity.

Given the above, the basic assumption of this study is that companies with good earnings will write off intangible assets for reasonable amounts and within a reasonable period of time, providing better disclosure than less profitable firms that, on the contrary, tend to postpone writing off intangible assets, and disclosing information of poor quality.

In particular, better-performing companies are expected to:

(1) perform the impairment of goodwill and other intangible assets more accurately;

(2) apply IAS 36 requirements more strictly, above all as regards: the reasonableness of the estimates of expected future flows; the basic assumptions of the test to check the recoverable value; and the relevance and appropriateness of the sensitivity analysis; and

(3) ensure a better quality of disclosure.

The consolidated financial statements of Italian banks were accordingly audited from 2009 to 2014, selecting the banks (Group) that posted intangible assets generated by business combinations in their financial statements during the study period, in order to ascertain if the banks which showed the best income-based performance had applied IAS/IFRS accounting standards more strictly and disclosed better and more reliable information.

The group consisting of 17 banks (13 listed and 4 unlisted), was selected according to the following criteria:

(1) The entire population of banks listed on the Italian Stock Market was taken into account; it was however necessary to exclude: five banks due to the substantial absence of intangible assets from M&A under the assets (Banca Profilo, Banca Finnat, Banco di Desio e della Brianza, Banca Popolare di Sondrio, Banca Ifis)[1]; and three additional banks that were included in the scope of consolidation of other listed banks (Creberg, Banca Intermobiliare and Banco di Sardegna, respectively controlled by Banco Popolare, Veneto Banca and Banca Popolare dell'Emilia Romagna), making their inclusion a question of double counting.

(2) All the unlisted banks were taken into account, according to the following criteria:

- cooperative banks were excluded, because prior to the Revised IFRS 3, the mutual entities were not included in the field of application of accounting standards;

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- consolidated financial statements, given that separate financial statements alone do not provide full proof of the intangible assets generated by the business combinations (goodwill and other intangible assets may be implicit in the book value of shareholdings);
- goodwill/total assets and goodwill/equity ratios exceeding the respective median ratio measured for the listed banks in 2009; and
- entities with at least one business combination as from 2005, thus excluding banks without intangible assets from M&A posted after the introduction of IAS/IFRS standards in Italy.

The Group of 17 banks shown by Table I was selected according to the above criteria; the banks represent about 90 per cent of the total assets of the Italian credit system[2].

The analysis of the financial statements of the banks in the group, and the subsequent construction of the intangible asset ratio with respect to the total assets and equity for each bank and for each of the financial years made subject of the study, confirmed the importance of the intangible assets and, consequently, how very important it is to evaluate the same (correctly). Generally speaking, there is a net reduction of the impact on assets and equity in time, mostly due to the impairment losses posted by the banks in the Group (above all) in 2011 and 2013; the analysis also shows that in the intangible assets from M&A, goodwill[3] is predominantly important.

The research assumption, namely that banks with high income-based performance disclose the best information, meant that it was necessary to identify the explanatory variables of these two aspects.

In the first case, the income performance ratio (IPR) used was that obtained by dividing the other comprehensive income (OCI) by equity. The use of the OCI rather than the net result (item 340 of the income statement: Profit/loss for the period of the parent company) is considered to give a better representation of the income capacity of the bank, since the changes in reserves for valuation of the financial instruments available for sale, and the result of cash flow hedges are included in the calculation of the same.

| Bank | Listed |
|---|---|
| Banca Carige | Yes |
| Banca Generali | Yes |
| Banca MPS | Yes |
| BP Emilia Romagna | Yes |
| BP Etruria e Lazio | Yes |
| BP Bari | No |
| BP Milano | Yes |
| BP Vicenza | No |
| Banco Popolare | Yes |
| CR Parma e Piacenza | No |
| Credito Emiliano | Yes |
| Credito Valtellinese | Yes |
| Intesa Sanpaolo | Yes |
| Mediobanca | Yes |
| Unicredit | Yes |
| UBI | Yes |
| Veneto Banca | No |

**Table I.**
The group of 17 banks studied

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In the second case, given the need to identify a proxy for the quality of disclosure, a marker called global assessment (GA) was used and calculated for each bank in the group for each of the six years, after appreciation of the following four items:

(1) completeness of the general information relevant to the intangible assets (disclosure);

(2) appropriate description of the process used to check the existence of impairment losses (impairment test);

(3) consistency of the basic parameters indicated in the financial statements and used for the impairment test with respect to the reference context, operating results (historical and current) and business plan, if published; and

(4) sensitivity analysis, based on the valuation of: the significance and continuity in time of the parameters made subject of the stress analysis; and the significance of the changes in the value applied to the basic parameters.

A score from 0 (no references or absolutely inadequate references) to 4 (satisfactory – best practices)[4] was allocated to each of the four previous items (acronym: A1, A2, A3 and A4). The choice of a short scale reduced the dispersion of ratings, and limited the margin of subjectivity; the soundness of this choice was confirmed by a similar decision by the European Banking Authority in its Guidelines on common procedures and methodologies for the supervisory review and evaluation process of banking intermediaries, where a rating scale of (only) five levels was used.

The GA for each bank was calculated with the simple average of the scores obtained for each of the four items. The choice of equal-weighting is based on a principle of neutrality (a priori). An alternative weighting principle, e.g. 20 per cent for the first two items and 30 per cent for others, could, theoretically, have been considered more appropriate, given that A3 and A4 provide more interesting information to the market and stakeholders; this decision might not have been perfectly neutral, with the risk therefore of potentially strengthening the link between profitability and accounting quality.

The reasonableness of the research assumption is analysed in the next section of the paper in three steps:

(1) A preliminary analysis of the key IPR and GA variables according to the values for each of the banks in the group for each year in the period 2009/2014. In order to appropriately describe the extreme variability of the empirical values with respect to the average values of these variables, homogeneous groups of banks are created by means of a multivariate, cluster analysis.

(2) The actual existence of a link between key IPR and GA variables is assessed, and the direction is analysed by constructing correlation indices.

(3) A multivariate linear regression is used to assess the impact on the GA of the IPR, the impairment intensity (II) and the impact of intangible assets on equity (IA/E), in order to reconfirm the results obtained from the previous bivariate analysis.

## 4. Empirical analysis

Table II shows the average, the standard deviation (Std) and the corresponding variability index on the maximum (VIM) values of the IPR, together with the percentage changes in average values from 2009 to 2014 [5]. The values were calculated for the group as a whole and for the two specific subsets of listed and unlisted companies.

Figure 1 shows the dynamic in time of the IPR averages recognised in the period 2009-2014 calculated for the group as a whole, and for each of the two listed and unlisted bank sub-groups.

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| | 2009 | 2010 | 2011 | 2012 | 2013 | 2014 |
|---|---|---|---|---|---|---|
| *Group* | | | | | | |
| Average | 0.063 | 0.030 | −0.164 | 0.054 | −0.037 | −0.092 |
| Std | 0.059 | 0.055 | 0.217 | 0.168 | 0.225 | 0.260 |
| VIM | 0.501 | 0.519 | 0.465 | 0.473 | 0.432 | 0.465 |
| Δ% | | | | | | −245 |
| *Listed banks* | | | | | | |
| Average | 0.067 | 0.033 | −0.194 | 0.045 | −0.056 | −0.088 |
| Std | 0.066 | 0.062 | 0.241 | 0.193 | 0.256 | 0.286 |
| VIM | 0.550 | 0.579 | 0.505 | 0.543 | 0.487 | 0.514 |
| Δ% | | | | | | −232 |
| *Unlisted banks* | | | | | | |
| Average | 0.053 | 0.019 | −0.068 | 0.083 | 0.025 | −0.104 |
| Std | 0.033 | 0.015 | 0.054 | 0.035 | 0.027 | 0.177 |
| VIM | 0.826 | 0.979 | 1 | 0.974 | 0.819 | 0.942 |
| Δ% | | | | | | −299 |

**Table II.**
Average, standard deviation (std) and corresponding variability index on the maximum values of the IPR from 2009-2014

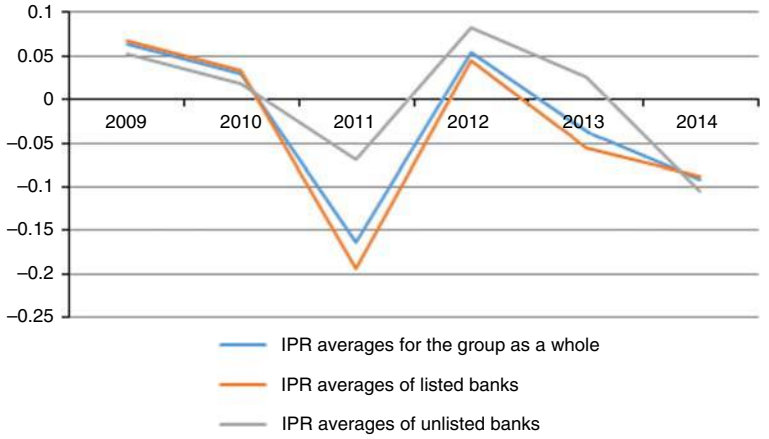


**Figure 1.**
Dynamic over time of the IPR averages in the period 2009-2014

In the graph, profitability shows a downward trend, probably due to the impact of the adverse macro-economic conditions after the 2008 crisis; the discontinuity in the trend in 2012 is probably due to the lower risk premium on Italian government bonds, after the sudden increase in 2011, which allowed most banks in the group to post consistent profits from the valuation and sale of sovereign bonds portfolios. The general economic downturn led to further losses over the next two years.

These initial observations on the IPR should be carefully considered because, as confirmed by the standard deviation and corresponding variability index on the maximum values in Table II, the differences in IPR values in each year for the banks studied and the annual average IPRs, are very high (VIM no less than 43 per cent in all cases, with particularly high peaks for unlisted banks).

The variability of the indicator suggests that further statistical analyses are required. In order to obtain more information on the IPR for inter-company comparison, using the IPR values posted in each year by the banks, a cluster analysis (Bolasco, 1999; Fabbris, 1983), was carried out in order to subdivide the banks into three homogeneous classes: those with IPR values that, as a whole, were higher, average and lower during the study period.

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All the variables used as clustering inputs were significant in the grouping process, and produced comparable results with either a non-hierarchical k-means algorithm (which subdivides the banks into separate subsets, so that each cluster is associated to a centroid and each bank is assigned to the cluster whose centroid is closest), or different hierarchical-type methods that organise the units on a tree (dendrogram) constructed according to a matrix of similarities between objects obtained according to a specific criterion.

Table III gives the composition of the three homogeneous groups of banks given by the *k*-means type procedure.

The annual IPR calculated involves a number of critical aspects that make it unsuitable to represent the structural capacity to generate income. Cluster 1 in Table III therefore shows the banks which in the six years studied posted a positive accumulated OCI, together with the banks that had a negative accumulated OCI. As shown by Table IV, in the period 2009-2014,

**Table III.**
Composition of the three homogeneous groups of banks obtained according to the assessment of the overall levels reached in the different years from IPR

| Cluster 1<br>Characteristics of the class: banks who recognised IPR values that as a whole were the highest over six years | Cluster 2<br>Characteristics of the class: banks who recognised IPR values that as a whole were average over six years | Cluster 3<br>Characteristics of the class: banks who recognised IPR values that as a whole were the lowest over six years |
|---|---|---|
| Banks | Banks | Banks |
| Banca Generali | Unicredit | Banca MPS |
| BP Emilia Romagna | Veneto Banca | |
| Credito Emiliano | BP Etruria and Lazio | |
| BP Bari | Banco Popolare | |
| CR Parma e Piacenza | Banca Carige | |
| Mediobanca | | |
| Credito Valtellinese | | |
| UBI | | |
| Intesa Sanpaolo | | |
| BP Vicenza | | |
| BP Milano | | |

**Note:** For the year 2014, the accounts situation as of 30 September was taken into account, because the bank was then placed under compulsory administration

**Table IV.**
IPR cumulated value of the banks in the group between 2009 and 2014

| Name of bank | IPR accumulated from 2009-2014 (%) |
|---|---|
| Banca MPS | −115 |
| BP Etruria e Lazio | −49 |
| Banca Carige | −44 |
| Banco Popolare | −44 |
| Unicredit | −29 |
| Veneto Banca | −21 |
| Credito Valtellinese | −18 |
| UBI | −13 |
| Intesa Sanpaolo | −8 |
| BP Vicenza | −7 |
| BP Milano | −4 |
| BP Bari | 7 |
| BP Emilia Romagna | 15 |
| CR Parma e Piacenza | 25 |
| Mediobanca | 32 |
| Credito Emiliano | 34 |
| Banca Generali | 155 |

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Credito Valtellinese, UBI, Intesa Sanpaolo, BP Vicenza and BP Milano showed a negative accumulated OCI, even if this was under that of the banks allocated in Clusters 2 and 3.

In a similar way as the analysis of the IPR, Table V shows the average, the standard deviation (Std) and the coefficients of variation (CV) of the GA, together with the percentage changes of the average values from 2009 to 2014 (see footnote 5). The values were calculated for the group as a whole, and for the two specific subsets of listed and unlisted companies.

Figure 2 shows the dynamics in of the GA averages posted in the period 2009-2014 calculated for the group as a whole, and for each of the two listed and unlisted bank sub-groups.

The GA gradually improves in the period examined, both for the group and the two sub-groups; the trend does however show a number of inconsistencies that are worth mentioning.

As confirmed by the financial statements, the downturn in 2010 in the case of the listed banks stems from the fact, that many of these changed, without evident justification, the quantitative parameters used in the impairment test, namely they avoided having to recognise impairment losses on intangible assets, despite the fact that the stress analysis had shown recoverable values for some CGU's below their respective book values; most of

| | 2009 | 2010 | 2011 | 2012 | 2013 | 2014 |
|---|---|---|---|---|---|---|
| *Group* | | | | | | |
| Average | 1.72 | 1.71 | 1.94 | 1.89 | 1.84 | 1.91 |
| Std | 0.712 | 0.626 | 0.622 | 0.645 | 0.547 | 0.632 |
| CV | 0.414 | 0.367 | 0.320 | 0.341 | 0.297 | 0.331 |
| Δ% | | | | | | 10.80 |
| *Listed banks* | | | | | | |
| Average | 1.88 | 1.75 | 2.02 | 2 | 2 | 2.04 |
| Std | 0.733 | 0.707 | 0.680 | 0.699 | 0.544 | 0.673 |
| CV | 0.389 | 0.404 | 0.340 | 0.350 | 0.272 | 0.33 |
| Δ% | | | | | | 8.33 |
| *Unlisted banks* | | | | | | |
| Average | 1.19 | 1.56 | 1.69 | 1.56 | 1.38 | 1.5 |
| Std | 0.239 | 0.239 | 0.239 | 0.315 | 0.144 | 0.204 |
| CV | 0.202 | 0.153 | 0.142 | 0.201 | 0.105 | 0.134 |
| Δ% | | | | | | 26.3 |

**Table V.**
Average, standard deviation and coefficient of variation of the global assessment (GA) from 2009 to 2014

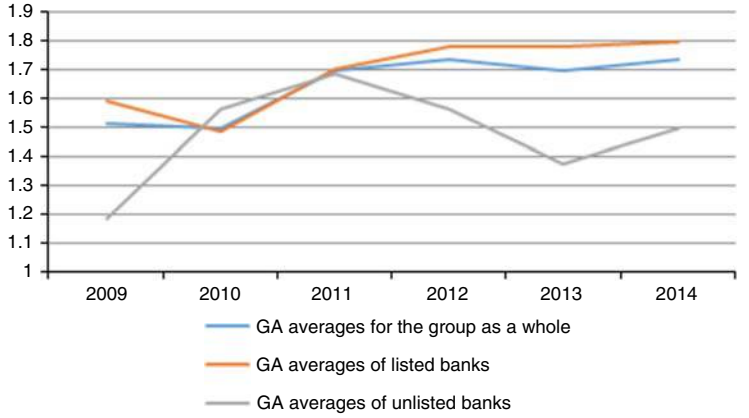


**Figure 2.**
Dynamic over time of the GA averages in the period 2009-2014

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the above banks then posted high write-offs the year after, and this explains the recovery of the GA.

In the case of unlisted banks, the positive trend in the period from 2009 to 2011 is largely due to the A1 and A2 items, while in the period 2012-2013 the downturn is due to a less strict application of accounting standards and the consequent drop of A3 and A4. The recovery in 2014 is due to the increase of A3 and A4 due, above all, to two banks which realigned the book values and economic value of the intangible assets.

These initial considerations on the dynamics in time of the GAs should however be accepted with caution because, as shown by the values of the Std and CV in Table V, the variability of the GA between the different banks is high (CV no less than 27 per cent for the group and listed banks; less for the unlisted banks).

In order to provide additional references to ensure more accurate analysis of the disclosure summarised by the GA, a cluster analysis was performed with the same methodology as that of the IPR, to classify the banks into three homogeneous groups, distinguishing those with GA values that were as a whole the highest, average and the lowest during the study period.

As before, all the variables used as clustering input, were significant in the grouping process. The grouping produced substantially comparable results with different hierarchical methods, in whose application different similarity measurements were tested.

Table VI gives the composition of the three homogeneous classes of banks resulting from the Ward method (Kaufman and Rousseeuw, 2005).

By narrowing the cluster analysis to the average of A3 and A4 alone (which, as mentioned previously, are of greater interest to the market and stakeholders), the results obtained are more closely aligned to the basic research assumption. As shown by Table VII, Cluster 3 contains only the banks that in the six years studied showed a negative accumulated OCI.

Given the above, the basic assumption was checked. In other words, if the banks with the best income-based performance (measured via the IPR) are indeed the banks with the best accounting quality score (measured via the GA).

In order to quantify the strength of the link between the two variables, the values of the Pearson correlation ratio $\eta^2_{GA/IPR}$ were calculated for each year. The $\eta^2_{GA/IPR}$ values are shown by Table VIII together with the percentage changes between the beginning and the end of the period studied.

The table shows that the GA strongly depends (on average) on the IPR. In order to assess the dynamics in time of the value of $\eta^2_{GA/IPR}$, Figure 3 shows the values posted in the 2009-2014 for the group as a whole and for the two sub-groups of listed/unlisted banks.

**Table VI.**
Composition of the three homogeneous classes of banks obtained according to the assessment of the overall levels reached in the different years from GA

| Cluster 1<br>Characteristics of the class: banks with the highest GA values in the six years | Cluster 2<br>Characteristics of the class: banks with average GA values in the six years | Cluster 3<br>Characteristics of the class: banks with the lowest GA values in the six years |
|---|---|---|
| Banks | Banks | Banks |
| Credito Emiliano | UBI | Banca Carige |
| | Intesa Sanpaolo | BP Etruria e Lazio |
| | Unicredit | Veneto Banca |
| | BP Emilia Romagna | Banca MPS |
| | Banco Popolare | Banca Generali |
| | | Credito Valtellinese |
| | | Mediobanca |
| | | BP Vicenza |
| | | BP Bari |
| | | CR Parma e Piacenza |
| | | BP Milano |

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| Cluster 1<br>Characteristics of the class: banks with the highest A3 and A4 values as a whole in the six year period | Cluster 2<br>Characteristics of the class: banks with average A3 and A4 as a whole in the six year period | Cluster 3<br>Characteristics of the class: banks with the lowest A3 and A4 values as a whole in the six year period |
|---|---|---|
| Banks | Banks | Banks |
| Credito Emiliano | Banca Carige | BP Etruria e Lazio |
| | MPS | Veneto Banca |
| | Banca Generali | BP Milano |
| | BP Emilia Romagna | BP Vicenza |
| | Banco Popolare | |
| | Credito Valtellinese | |
| | Mediobanca | |
| | BP Bari | |
| | CR Parma e Piacenza | |
| | UBI | |
| | Intesa San Paolo | |
| | Unicredit | |

**Table VII.**
Composition of the three homogeneous classes of banks obtained according to the assessment of the overall levels reached in the different years from A3 and A4

| | 2009 | 2010 | 2011 | 2012 | 2013 | 2014 |
|---|---|---|---|---|---|---|
| *Group* | | | | | | |
| $\eta^2_{GA/IPR}$ | 0.915 | 0.866 | 0.943 | 0.926 | 0.943 | 0.953 |
| $\Delta$% | | | | | | 4.19 |
| *Listed banks* | | | | | | |
| $\eta^2_{GA/IPR}$ | 0.943 | 0.866 | 0.972 | 0.962 | 0.951 | 0.972 |
| $\Delta$% | | | | | | 3.08 |
| *Unlisted banks* | | | | | | |
| $\eta^2_{GA/IPR}$ | 0.807 | 0.846 | 0.849 | 0.857 | 0.898 | 0.912 |
| $\Delta$% | | | | | | 13.01 |

**Table VIII.**
Values of the Pearson correlation ratio $\eta^2_{GA/IPR}$ and relevant changes from 2009 to 2014

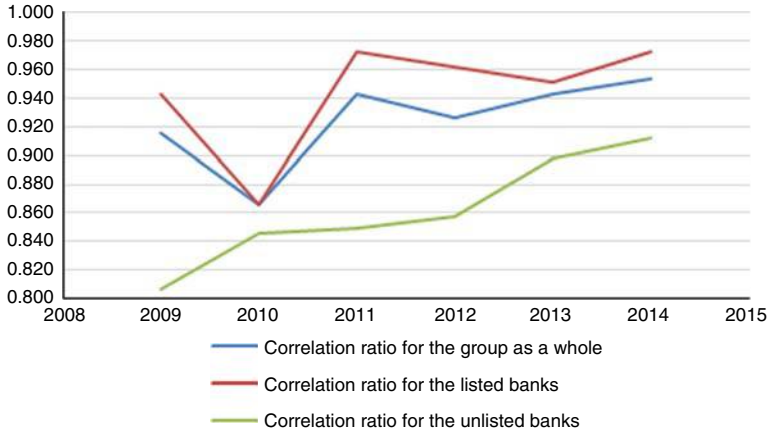


**Figure 3.**
Dynamic over time of the correlation ratio $\eta^2_{GA/IPR}$ in the period 2009-2014

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The trend of the correlation ratio seems to be consistent with the macroeconomic context in question, and the behaviour of the banks in the group. The reduced ratio in 2010 for listed banks (and for the group as a whole, 76 per cent of which are listed banks) is due, as previously mentioned, to the worsening of the GA: the modified parameters used in the impairment test resulted in lower write-offs in 2010 (than would otherwise have been necessary), and a consequent improvement of the OIC. In the following year most of the value adjustments not previously made were posted, producing a negative impact on the OCI and a recovery of the GA.

Having confirmed the strong link between the IPR and GA, in order to determine its direction, scatter plots were created of the two variables for all the years between 2009 and 2014, that showed a substantially positive relationship between the IPR and GA in the period in question (see footnote 5).

The Braais-Pearson linear correlation coefficient $r$ was then calculated, given that, by varying this in the range [−1, +1], it could provide further information regarding the link direction. Examining the scatter plots of the IPR and GA for single years however suggested calculating the $r$ index only for the last three years of the analysis, due to the fact that there was limited evidence of a linear relationship between the two variables in the first three years.

Table IX shows the values recorded by the $r$ index in the period 2012-2014 for the entire group and for the subgroups of listed and unlisted banks, which show a positive link and tangentially a linear link between income trend and accounting quality. This link increases in time, with the exception of the unlisted banks for which the value of the $r$ ratio in the years 2012 and 2013 is in any case considerably higher than that shown by the listed banks and the group as a whole.

In order to reconfirm the results obtained by the previous bivariate analyses, the following multivariate linear regression model was implemented on the data of each year:

$$\mathrm{GA}_i = \beta_1 \mathrm{IPR}_i + \beta_2 \mathrm{II}_i + \beta_3 \left(\mathrm{IA/E}\right)_i + \varepsilon_i \quad (1)$$

where $i = 1, \ldots, n$ are the banks considered to evaluate the impact on the GA of the IPR together with the impairment intensity (II = Impairment loss$_{(t)}$/Intangible assets$_{(t-1)}$) and the impact of the intangible assets on equity (IA/E = Intangible assets$_{(t)}$/Equity$_{(t)}$). In the model, the error term $\varepsilon_i$, as usual, is normally distributed.

The estimated model parameters (Table X) confirm the results obtained[6] by the previous bivariate analyses, showing that the link between GA and IPR is statistically significant (with a significance level that increases in time) and is positive in all the years considered (separately analysed and on average).

**Table IX.** Values of the Bravais-Pearson linear correlation index and relevant changes from 2012 to 2014

| | 2012 | 2013 | 2014 |
|---|---|---|---|
| *Group* | | | |
| $r$ | 0.20 | 0.13 | 0.46 |
| Δ% | | | 132 |
| *Listed banks* | | | |
| $r$ | 0.23 | 0.25 | 0.51 |
| Δ% | | | 126 |
| *Unlisted banks* | | | |
| $r$ | 0.88 | 0.70 | 0.40 |
| Δ% | | | −54 |

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## 5. Conclusions

The analysis of a group of Italian banks in the period 2009-2014 showed a number of trends previously observed in literature. First, it would seem that the group as a whole postpones the posting of impairment losses on intangible assets from M&A; second, listed banks show greater compliance in the application of IAS-IFRS standards with respect to unlisted banks.

In the first case, we believe this is due to ineffective corporate governance mechanisms and inadequate monitoring by the auditors. The most critical issue is that of modifying the parameters to perform the impairment test (expected cash flows, discount rate, and growth rates of the cash flows to estimate the terminal value). It would therefore be desirable for standard setters and market regulators to strengthen the enforcement system in the direction indicated. The calculation of impairment test should be consistent in time; in exceptional circumstances where preparers decide to redefine critical parameters, they should: explain the changes; explain the reasons why these changes produce reliable and more pertinent information; and provide restated comparative figures, adopting a what if approach.

The basic assumption of this paper, namely that the best-performing banks disclose the best information for the impairment of intangible assets, is substantially confirmed by the results of the analysis performed.

More specifically, a statistical assessment of the data shows that there is a strong link between profitability (IPR) and the quality of financial reporting (GA), as confirmed by the high levels of the Pearson correlation ratio $\eta^2_{GA/IPR}$ over the entire period considered. The scatter plots of the two variables created for all the years between 2009 and 2014, show a substantially positive link between IPR and GC for the entire period. Moreover, the link is positive and tends to be linear in the years 2012-2014, with values of the $r$ index that increase in time, with exception of the unlisted banks when these decrease. In the case of the latter, the value of the $r$ index in the years 2012-2013 is in any case considerably higher than that of the listed banks and the group as a whole.

Furthermore, the implementation of a multivariate linear regression in which the impact of IPR on the GA, together with II and the impact of the IA/E, confirms the results previously obtained, confirming that the link between GA and IPR is statistically significant and positive in all the years considered (separately and on average).

The results suggest that it would be necessary to extend the analysis at an international level, checking the impairment policies for intangible assets (and related disclosures) used by EU banks. If the results from the international comparison confirm the existence of a positive link between GA and IPR (as ascertained for Italy), the next step would be to construct other multivariate models to further test the link between the many reasons that affect the assessment of the intangible assets reported in literature, but not taken into account in this study.

| Year | IPR parameter $\hat{\beta}_1$ | II parameter $\hat{\beta}_2$ | IA/E parameter $\hat{\beta}_3$ | $R^2$ | Adjusted $R^2$ |
|---|---|---|---|---|---|
| 2010 | 2.145 (3.248)***** | 46.354 (53.38)***** | 4.226 (0.558)***** | 0.85 | 0.82 |
| 2011 | 2.124 (1.717)**** | 4.244 (1.528)**** | 4.203 (0.772)**** | 0.84 | 0.81 |
| 2012 | 4.104 (2.48)*** | 3.936 (2.016)*** | 3.315 (1.203)*** | 0.81 | 0.80 |
| 2013 | 4.938 (2.169)** | 5.240 (1.699)** | 4.815 (1.082)** | 0.78 | 0.73 |
| 2014 | 4.928 (2.139)** | 5.239 (1.681)** | 4.802 (1.073)** | 0.78 | 0.72 |
| 2010-2014 | 5.733 (2.283)* | 8.643 (3.045)* | 3.734 (1.124)* | 0.85 | 0.81 |

**Notes:** *,**,***,****,*****Significant at 95, 90, 87, 75 and 50 per cent levels, respectively

**Table X.**
Multivariate linear regressions results

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## Notes

1. In the period 2009/2014, the five banks in question showed intangible assets with respect to the total assets of under 0.58 per cent, with a median oscillating between 0.24 per cent in 2009 and 0.15 per cent in 2014.
2. Source: processed by the authors according to data published by the Bank of Italy.
3. Detailed data are available on request. In 2009 the banks in the Group posted goodwill equal to 62.7 €/billion under their assets and 12.6 €/billion for other intangible assets from M&A (Brand name, Core deposits, Assets under management, Assets under custody, Customer relationships) with an average impact on the equity of 34.4 per cent. In 2014, the total intangible assets from M&A amounted to 18.2 €/billion with an impact of 14.9 per cent on the equity. Write-downs from write-offs in the entire period amounted to 54.9 €/billion, 90 per cent of which in 2011 and 2013.
4. In Table AI the meaning of the scores next to each item considered.
5. Detailed data are available on request.
6. Data are available on request. It was not possible to run the regression for the year 2009 because of the zero values of the variable II in that period. The preliminary analysis conducted for every regression highlighted the absence of clear outliers, a general distribution of each independent variable close to the normal and an acceptable level of collinearity among the regressors. The further OLS assumptions for a multiple regression were also tested.

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## Appendix

| Aspect | Absent = 0 | Mediocre = 1 | Poor = 2 | Sufficient = 3 | Satisfactory = 4 (Best-practice) |
|---|---|---|---|---|---|
| A1 | Absence of references or absolutely inadequate references | Superficial information provided (e.g. only the quantitative tables required by Bank of Italy Circular 262/2005), with minimal details or explanations, particularly as regards the indefinite useful life and "client-relationship based intangible assets" | The information table set forth by Circular 262/2005 is provided together with additional references that do not however comply with IAS 38 standard (e.g. absence of information on the criterion used to determine the useful life of intangible assets) | Description of all the items set forth by the reference law | Score allocated to cases that represent the best-market-practices on accounting disclosure |
| A2 | Absence of references or absolutely inadequate references | Superficial information provided (e.g. only the quantitative tables required by Bank of Italy Circular 262/2005), with minimal details or explanations, particularly as regards the indefinite useful life and "client-relationship based intangible assets". Absence of the impairment test on intangible assets arising from customer relations when the goodwill is written off in full | The information table set forth by Circular 262/2005 is provided supplemented by further references but in any case not in compliance with IAS 38 (e.g. lack of information as regards the basic parameters used in the impairment process, explanation of the impairment test only for the goodwill without reference to other applicable intangible assets) | Explanation of all the items set forth by the reference law. In particular, in the case of intangible assets from business combinations other than goodwill, the reasons for which the impairment test was performed or otherwise are given | Score allocated to cases that represent the best-market-practices on accounting disclosure |
| A3 | Absence of references or absolutely inadequate references | The exceptions to the accounting standards are not justified, or they are justified in an unsatisfactory manner, while the assumptions of the trends of the economic and financial variables are difficult to assert or obviously discontinuous with respect to the previous performance of the company or contrary to industry trends | The exceptions to the accounting principles are justified only in part, or the assumptions for the trends of the economic and financial variables are optimistic, or sufficient reasons are not given for the discontinuity with respect to the previous performance of the company | Consistency of the criteria applied in time or explanations in the case of any discontinuity, sustainable economic and financial forecasts | Detailed explanation of the business-plan with an indication of the gaps with respect to the trend for the industry suggested by survey companies; the basic parameters may be reconstructed in full; complete description of the main uncertainties, conservative approach to preparing the economic-financial forecasts |

(*continued*)

**Table AI.** Description of the scores meaning in relation to each aspect considered

| Aspect | Absent = 0 | Mediocre = 1 | Poor = 2 | Sufficient = 3 | Satisfactory = 4 (Best-practice) |
|---|---|---|---|---|---|
| A4 | Absence of references or absolutely inadequate references | Analysis limited to a single basic parameter or to several basic parameters, but applying comparisons that are not appropriate to represent a situation of stress; discontinuities in time of the parameters made subject of the stress test or unjustified stress scenarios. No justification for the absence of impairment in the case of stressed recoverable values under the book value. No references relevant to the higher recoverable value with respect to the book value after the application of the stress conditions | Analysis limited to two parameters but with insignificant stress assumption. No justification for the absence of impairment in the case of stressed recoverable values under the book value. Inconsistencies between the stress tests performed on Level I and II impairment tests. Indication of threshold values for at least two basic parameters. The parameters made subject of the stress tests are changed from year to year | Analysis of at least two parameters important for the performance of the company and application of significant stress scenarios; consistency in time of the stressed parameters and full compliance with the market context. Absence of stressed recoverable values under the book value | Analysis of at least two parameters important for the performance of the company with the application of less strict assumptions. Simultaneous stress of the basic parameters. Absence of stressed recoverable values under the book value |

**Table AI.**

**Corresponding author**
Anna Grazia Quaranta can be contacted at: annagrazia.quaranta@unimc.it

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