



**INTANGIBLE CAPITAL AND THE VALUATION OF
COMPANIES: A COMPARISON OF GERMAN AND U.S.
CORPORATIONS**

(INTERIM REPORT)

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SUMMARY:

The U.S. equity market puts a value on shareholder equity that is consistently more than twice the reported book value of a company, and many observers have pointed to the absence of most intangible assets from financial statements as an explanation of the gap. An earlier paper by Hulten and Hao found that much of the market-to-book-gap in the U.S. is explained by this omission. However, the market-to-book gap is by no means unique to U.S. corporations. The current paper looks at the financial statements of 12 German R&D intensive firms and finds a similar gap when most intangibles are excluded (the current accounting practice), and even bigger closing of the gap when they are included. The overall conclusion is that intangible investments are an important component of company value.

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I. Introduction

Market to Book Value Puzzle

Equity markets value a company and its assets according to what the highest bidder is willing to pay for the shares. One of the puzzles about these equity markets is why they tend to put a much higher value on a company than is indicated by the amount of shareholder equity on the balance sheet. This is the so-called market-to-book value puzzle. In an earlier paper, Hulten and Hao found that the gap for 617 R&D-oriented U.S. companies was quite large in 2006. The equity on the balances sheets of these companies accounted for only 31 percent of the corresponding market capitalization of the companies.

This price-to-book gap is too large to be attributed solely to the mismeasurement of conventional equity or to the vicissitudes of the stock market. Numerous observers, including Lev (2001), have argued that the problem is largely due to current accounting practice, which excludes most of the intangible assets developed within a corporation from the company's balance sheets. The money spent on R&D and brand development is treated as current expenses by accountants, even though the success of many companies depends on their capacity to develop and market products. A growing body of evidence suggests that companies should capitalize spending on R&D and other intangibles.^{1,2} Hulten and Hao (2008) report

¹ A growing literature explores the problem of accounting for intangibles in financial reports and valuing intangibles in the stock market, building on an earlier literature that examined the impact of R&D and advertising on the rate of profit (e.g., Grabowski and Mueller (1978)). Important overviews are provided by Lev (2001) and Blair and Waldman (2001). The literature on the economics of intangibles is reviewed in Corrado, Hulten, and Sichel (2005, 2006), and in the introductory comments of Corrado, Haltiwanger, and Sichel (2005). The general thrust of this literature is that a broad list of intangibles should be treated as capital expenditures.

² Recent estimates by Corrado, Hulten, and Sichel (CHS (2005, 2006)) suggest that there were approximately \$3.6 trillion in intangible assets in the U.S. nonfarm business sector in the period 2000- 2003, compared with some \$11 trillion in tangible plant and equipment. These estimates cover both corporate and noncorporate companies, although corporations accounted for some three-quarters of the total, according to the Bureau of Economic Analysis figures. The large size of the aggregate effect suggests that the average impact on the individual corporations in the non-farm business sector is also large.

that when R&D and organizational expenditures are capitalized and added to the balance sheet, the percentage of the market capitalization rises from 31 to 75 percent.

This finding is relevant for policy makers. The standard of living in high-wage economies is increasingly seen as dependent on investments in knowledge capital. “Knowledge capital” is a rather nebulous concept, but it surely includes R&D, worker training, and product development, and well as coinvestments in marketing and support and maintenance. As Mandel (2006) puts it: “Grab your iPod, flip it over, and read the script at the bottom. It says: ‘Designed by Apple in California. Assembled in China.’ Where the gizmo is made is immaterial to its popularity. It is great design, technical innovation, and savvy marketing that have helped Apple Computer sell more than 40 million iPods.”

How general are the Hulten-Hao results obtained for U.S. companies? Do they extend to companies in other high-income economies? This is the question examined in this research. We approach the problem by applying procedures similar to those used by Hulten-Hao to financial data derived from annual reports for the total of 12 German corporations and draw our attention on the different performance of a subsample of four automobile, three pharmaceutical, and five other high-R&D companies. We construct estimates of the cost of in-house investment in R&D and organizational capital for 2008 using data for the period from 1999 to 2008 to construct stocks for the new view balance sheet. We find that the addition of these intangibles to the conventional financial accounts increases the percentage of the market-to-book value gap in these companies from 48 percent to 110 percent when intangible capital is added to the balance sheets. This parallels the Hulten-Hao results and suggests that current financial practice understates the long-run intrinsic value of corporate Germany by a substantial amount.

This paper is organized as follows: The following section of this paper describes differences between the accounting principles IFRS and US GAAP. We then explain in detail the approach of our analysis and observe how traditionally generated income statements and balance sheets behave and how the market to book value as well as several key dimensions change, when internally generated R&D and organizational capital are capitalized in the following fourth section. We thereby distinguish between all, IT, and pharmaceutical companies.

II. Differences between IFRS and US GAAP

The movement towards a global economy has accelerated the need to move toward harmonized global accounting standards

The accounting environment has experienced many transformations during the last decade as a result of European regulations and changes in capital markets. The globalization of business activities and thus the increasing demand in capital has triggered the demand for timely and decision-useful investor information and thus for adjusted reporting systems. German companies participated increasingly in international capital markets, such as the New York Stock Exchange (NYSE) since the early 1990s. In this context, international accounting standards became relevant for German companies. At that time, all German firms prepared their financial statements according to the German Commercial Code (HGB – Handelsgesetzbuch) which was not known and not accepted outside of Germany. For example, to be listed at the NYSE, German corporations were to prepare their financial reports in accordance with US GAAP. Among all German companies, the Daimler Benz AG was the first German company who prepared additional financial information according to US GAAP to be listed at the NYSE in 1993³.

Long before the European Commission has made IFRS⁴ mandatory for consolidated financial statements of publicly traded companies in the European Union from 2005 onwards, the German legislation has opened up its accounting system to internationally accepted accounting standards to meet the demands of German capital market oriented firms. Amongst others, UN (2006) and Weißenberger et al. (2004) report that an increasing number of listed German companies published their financial statements according to international reporting systems, namely US GAAP or IFRS

³ Daimler-Benz AG prepared its consolidated statement in accordance with the German Commercial Code until 1995. For the listing at the NYSE and the required Form 20-F, an additional reconciliation of net income and stockholders' equity to values under U.S. GAAP was necessary 1993-1995. Financial statements were prepared entirely in accordance with US GAAP for the first time in 1996.

⁴ At that time, International Financial Reporting Standards (IFRS) were known by the older name of International Accounting Standards (IAS). The board of the International Accounting Standards Committee (IASC) has issued IAS between 1973 and 2001. The International Accounting Standards Board (IASB) adopted all International Accounting Standards in April 2001 and continued their development, calling the new standards IFRS.

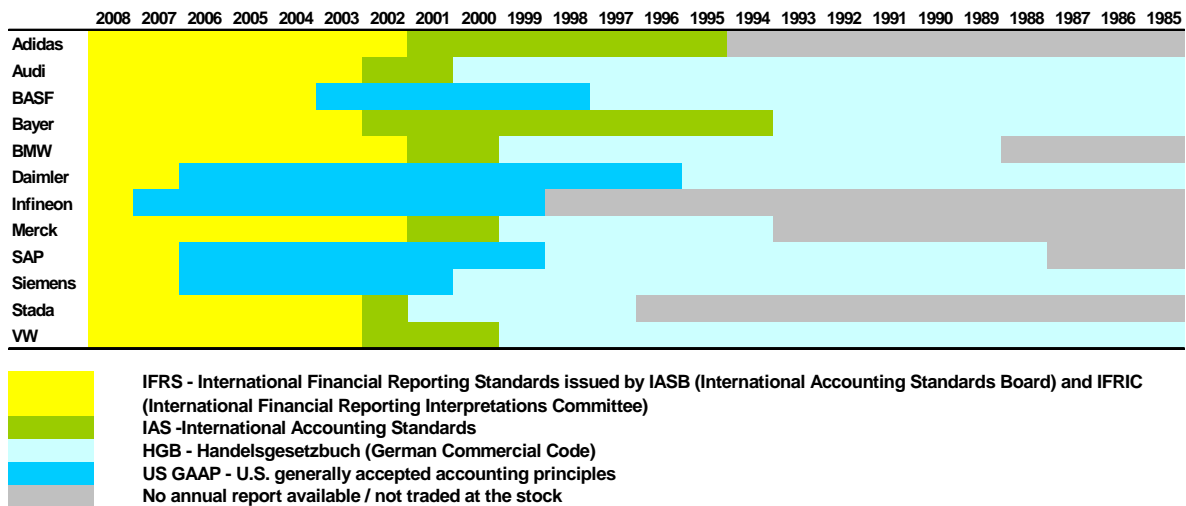
since 1993⁵. Already 20 per cent of the 30 companies listed at the German DAX-30⁶ published their financial statements according to IFRS, and further 10 per cent in accordance with US-GAAP in 1997. The German legislator approved this practice and allowed listed companies to prepare consolidated financial statements in accordance with internationally accepted accounting standards only, either IFRS or US GAAP in accordance with German GAAP in 1998 (§ 292a HGB). IAS tended to be closer to German GAAP compared to US-GAAP at that time, providing more accounting options. Thus, the majority of German companies who converted towards an international GAAP in the mid 1990s applied IFRS instead of US GAAP.

Figure 1 shows the accounting standards that were applied by the 12 German sample companies of this paper from 1985-2008. The developments described above are clearly visible when we compare the timelines. 7 out of 12 companies adopted IFRS before it became mandatory in 2005, and only 5 companies have chosen US GAAP. Even though IFRS were introduced within the European Union in 2005, Member States were allowed to defer the mandatory application of IFRS until 2007 for companies that either apply other international accepted accounting standards due to a listing outside the European Union or list debt securities only. The exemption from the latter rule until 2007 could have been applied by companies such as Siemens AG, Infineon Technologies AG, SAP AG, and Daimler AG because they are listed on the NYSE and thus prefer to prepare their financial reports the exemption under US GAAP.

⁵ Parallel and dual accounting was possible before 1998. Parallel reporting: companies prepared financial statements according to IFRS or US GAAP in addition to German GAAP reports. Dual reporting: Financial reports fulfilled simultaneously the requirements of the international and German GAAP (Gassen and Sellhorn, 2006).

⁶ DAX-30: Deutscher Aktienindex / German stock index: blue chip stock market index consisting of the 30 major German companies trading on the Frankfurt Stock Exchange. It measures the performance of the Prime Standard's 30 largest German companies in terms of order book volume and market capitalization. 9 out of our 12 sample companies are constituents of the DAX-30 (Adidas AG, BASF SE, Bayer AG, BMW AG, Daimler AG, Merck KGaA, SAP AG, Siemens AG, Volkswagen AG)

Figure 1: Accounting standards of financial statements of 12 sample companies



Treatment of Intangibles under US GAAP and IFRS

For the aim of our paper, the different treatment of intangibles, especially research and development costs, under US GAAP and IFRS is of special interest, as it affects directly the main question of the paper: how much of the market-to-book value puzzle can be explained by the inclusion of internally generated intangible assets on corporate financial statements.

Many publications, such as Deloitte (2008), KPMG (2008), or PWC (2008) summarize differences and similarities between US GAAP and IFRS. The recognition and measurement of intangible assets could differ significantly under IFRS compared to US GAAP. US GAAP requires all costs related to research and development to be expensed as they incurred. Therefore, the fair value of in-process R&D needs to be determined and expense immediately. There are only a few exceptions where different rules apply and US GAAP prohibits the capitalization of development costs. For example, costs related to the development of software for internal use or to software for sale to third parties are recognized initially at cost, but there are different thresholds for when capitalization commences. A Revaluation of intangible assets is also prohibited under US GAAP.

IFRS differentiates between research and development costs. According to IAS 38, all expenses related to research are expensed in full in the period in which they incurred. Development costs that initially are recognized as expenses cannot be capitalized in a subsequent period. Development costs are capitalized if, and only if, specified narrowly defined criteria are met:

- Development cost can be measured reliably
- Intention and technical feasibility of completing the intangible asset
- Ability to use or sell the intangible asset
- Future economic benefits are probable (external use: existence of a market for the output has to be demonstrated or; internal use, usefulness of the intangible asset has to be demonstrated).

The capitalization and amortization of certain development costs under IFRS addresses the absence of many internally generated intangibles on corporate financial accounts and consequences explained in the introduction. It is a step into the right direction as the discrepancy between the market and book value decreases. Nevertheless, the conditions for capitalization of these expenses are often not satisfied in reality in full, and development costs are mostly expensed as incurred. The success of development projects is often uncertain and subject to approval procedures. The requirements of IAS 38 are seldomly fulfilled and development costs are not capitalized in the pharmaceutical sector due the high level of risk up to the time pharmaceutical products are marketed. Amongst the 12 German sample companies, the automobile companies had the highest share of capitalized development cost in all research and development costs.

Table 1 from KPMG (2008) summarizes equal and different treatment of Intangible Assets under IFRS and. Other areas with selected major differences between those two accounting principles are shown in Appendix 1: Inventory, Property Plant Equipment, and Impairment of Assets.

Table 1: Treatment of intangible assets under US GAAP and IFRS (IAS 38)

IFRS	US GAAP
<ul style="list-style-type: none"> • An intangible asset is an identifiable non-monetary asset without physical substance. • An intangible asset is identifiable if it is separable or arises from contractual or legal rights. • Intangible assets generally are recognised initially at cost, which is the fair value of the consideration given. • Goodwill is recognised only in a business combination and is measured as a residual. • Acquired goodwill and other intangible assets with indefinite useful lives are not amortised, but instead are subject to impairment testing at least annually. • Intangible assets with finite useful lives are amortised over their expected useful lives. • Subsequent expenditure on an intangible asset is capitalised only if the definition of an intangible asset and the recognition criteria are met. • Intangible assets may be revalued to fair value only if there is an active market. • Internal research expenditure is expensed as incurred. Internal development expenditure is capitalised if specific criteria are met. These capitalisation criteria are applied to all internally developed intangible assets. • Advertising and promotional expenditure is expensed as incurred. • Expenditure on relocation or reorganisation is expensed as incurred. • The following costs cannot be capitalised as intangible assets: internally generated goodwill, costs to develop customer lists, start-up costs and training costs. 	<ul style="list-style-type: none"> • Like IFRSs, an intangible asset is an asset, not including a financial asset, that lacks physical substance. • IFRSs, an intangible asset is identifiable if it is separable or arises from contractual or legal rights. • Like IFRSs, direct-response advertising, software developed for internal use, and software developed for sale to third parties are recognised initially at cost. • Other Intangible assets generally are recognised at fair value, which usually equals the fair value of the consideration given, like IFRSs. • Like IFRSs, goodwill is recognised only in a business combination and is measured as a residual. • IFRSs, acquired goodwill and other intangible assets with indefinite lives are not amortised, but instead are subject to impairment testing at least annually. • Like IFRSs, intangible assets with finite lives are amortised over their expected useful lives. • Subsequent expenditure on an intangible asset is not capitalised unless it can be demonstrated that the expenditure increases the utility of the asset, which broadly is like IFRSs. • Unlike IFRSs, intangible assets cannot be revalued. • Unlike IFRSs, both internal R&D expenditure is expensed as incurred. Special capitalisation criteria apply to direct-response advertising, software developed for internal use, and software developed for sale to third parties, which differ from the general criteria under IFRSs. • Unlike IFRSs, direct-response advertising expenditure is capitalised if specific criteria are met. Other advertising and promotional expenditure is expensed as incurred, like IFRSs. • IFRSs, certain relocation costs following a business combination are capitalised. Other relocation or reorganisation expenditures are expensed as incurred, like IFRSs. • Like IFRSs, the following costs cannot be capitalised as intangible assets: internally generated goodwill, costs to develop customer lists, start-up costs and training costs.

Source: KPMG (2008): IFRS compared to U.S. GAAP: An overview.

III. Approach of the Analysis

Selection of companies for our analysis

Figure 2 shows which German joint stock companies we selected for this paper including both subgroups. The selected 12 German joint stock companies are considered to be top R&D spenders. The financial data stems directly from their published annual reports. We calculated averages of all 12 German joint stock companies “ALL” in our traditional and new view financial statements, as well as for the subsamples of 4 automobile “CAR” and 3 pharmaceutical companies “PHARMA”. The numbers in parentheses indicates the rank amongst the top 100 R&D spenders worldwide in 2006 published by Standard Poor’s. The financial statements of PHARMA are based on an average of the publicly available income statement and balance sheets of these six companies.

Figure 2: Selected joint stock companies and subgroups for the analysis

Analyzed groups:	
1. All 12 companies	
2. Pharmaceutical companies	
3. Automobile manufacturers	
Adidas AG	Infineon Technologies AG (61)
Audi AG	Merck KGaA (100)
BASF SE (59)	SAP AG (58)
Bayer AG* (38)	Siemens AG (8)
BMW AG (31)	STADA Arzneimittel AG
Daimler AG (6)	Volkswagen AG (10)

Note: *Bayer Schering Pharma AG, listed on the Standard and Poors’s list on rank 74, is a subsidiary of Bayer AG within the subgroup Bayer Health Care. As Bayer Schering Pharma AG is fully owned by Bayer AG, the stocks are not trade at the stock separately and own annual reports are not published. Hence, we cannot differentiate between Bayer AG and Bayer Schering Pharma AG in our analysis.

There is a fundamental asymmetry in accounting practice how R&D is treated: R&D is capitalized when the R&D is produced externally but expensed when it is produced internally, except the fraction of development costs that can be capitalized if certain criteria are met under IFRS - which is practically not often the case. We treat all internally generated R&D and organizational capital as an investment in the company instead of a pure cost and examine what effect this has on the company's financial accounts. We will show that this alternative view of R&D involves an expanded concept of "output" and "revenues". Therefore, we construct estimates of the cost-in-house investment in R&D and organizational capital in the following way and add these estimates stepwise to financial statements generated in a traditional way.

Expenditures related to research and development:

Own Production of R&D is a shadow value of the investment in R&D made by the company. It is equal to current cost of R&D shown in traditional annual reports, which is considered to be a capital expenditure except the fraction of development costs that met the criteria for capitalization under IFRS, plus an imputed mark-up for profit R&D. As the actual magnitude of this return is unknown, we therefore use an imputation procedure that allocates the total operating surplus to R&D according to R&D's share in current expense. This is the cost side of the investment and if the company is assumed to make its investment decisions using the discounted present value approach, own production of R&D is also the present value of the future profits on the investment.

As with plant and equipment, R&D investments depreciate in value over time. There is, however, an important difference. Machines lose value because they are used up in production due to wear, tear, and accident, or because of the obsolescence arising from the development of superior types of machinery. R&D capital, on the other hand, is more closely tied to the output it generates and is therefore subject to losses in value arising from competition from superior types of output, not superior inputs, as in the machinery case. R&D knowledge is largely a non-rival public good whose benefits can accrue to other users without diminishing the quantity available to the originator. The value of the R&D to the originator, on the other hand, is limited to the commercial value that can be extracted from the investment. If the knowledge

diffuses to competitors, that value is eroded as competition leads to lower product prices. Even though the appropriate depreciation rate for each intangible asset is debatable, we decided to amortize own production of R&D over a useful life of 10 years.

Expenditures related to organizational capital:

Own Production of Organizational Capital is also a shadow value of the investment in organizational capital made by the company. R&D is not the only type of intangible expenditure in the innovation process. Companies also invest in organizational development (e.g., strategic planning, new management systems) and worker training. Expenditures for brand equity and organizational development are usually not reported on financial statements. So we borrow the CHS/HH procedures and translate their approximate proportions of brand equity and organizational development investment into a corresponding fraction of SG&A spending. This leads us to impute about 30 percent of the companies total SG&A outlays in 2008 to investment in organizational capital.

Organizational investments depreciate over time for a variety of reasons. Brand equity loses value when new goods appear in the market place or the marketing programs of competitors cut into market share, and human capital erodes through worker attrition and with the adoption of new products, processes, and business models. Management competencies erode for many of the same reasons. We amortize own production of organizational capital over a useful life of 6 years.

In the next section of our paper, we compare the traditional view of income statements and balance sheets with financial statements where we add internally generated R&D and organizational capital stepwise.

IV. Comparison of traditional and new view financial statements

Hulten and Hao (2008) argue that because R&D expenses and part of SG&A costs are actually investments, they should appear as enhancements to company balance sheets and income statements. They examine 617 R&D-oriented companies and find that the market-to-book value gap was 69 percent in 2006, and that this gap narrows to 25 percent when these intangible assets are taken into account. In this report, we do a parallel examination of 12 R&D intensive German companies for the year 2008: the pharmaceutical companies Bayer, Merck and Stada: the IT companies Infineon, Sap and Siemens: the automobile companies Audi, BMW, Daimler and Volkswagen: and two other companies, Adidas and BASF. For these companies as a whole (the ALL sample), the initial market-to-book gap is 48 percent. The question we pose is whether the inclusion of a similar set of intangibles, constructed using similar techniques and assumptions, would narrow or close this gap.

Following HH, we must first translate R&D expenses and part of SG&A costs into investment. The German companies in our sample spent heavily on R&D and organizational capital: they spent 1,744 million Euros on R&D in 2008, equivalent to 4.1% of total revenue. The three German PHARMA companies spent an average of 1,310 million Euros on R&D in 2008, or 9.3% of total revenue, while the three German IT companies spent an average of 2,055 million Euros on R&D in 2008, or 6.6% of total revenue. As for spending on organizational capital, we follow CHS and HH and treat 30% of SG&A costs as investment on organizational capital. Under this convention, the companies in our ALL sample on average spent 1,212 million Euros or 2.9% of revenues on organizational capital. The details are set out in Tables 2 through 7.

These figures refer to current expenditures on R&D and organizational capital. This is not, however, the full value of the corresponding investments. To get at the full value, the profit associated with producing the investments must also be included. For example, if a research firm spends 8 million Euros to develop a new molecule, it must realize a profit in order to generate a return to the capital used in the development process. Thus, the development company might sell the new molecule to a pharmaceutical company at the price of 10 million Euros, and the pharmaceutical company records the investment of 10 million Euros on its balance sheet.

Accordingly, we add part of the operating surplus to the current cost of R&D and organizational capital (a pro rata share of cost). After making this adjustment, we estimate that all companies in our sample on average invested 2,058 million Euros in R&D and 1,453 million Euros in organizational capital (see Tables 2 and 3). Similarly, the three pharmaceutical companies invested an average of 1,706 million Euros in R&D and 1,585 million Euros in organizational capital. The three IT companies invested 2,399 million Euros in R&D and 1,648 million Euros in organizational capital.

The annual investments in each item are then added to the existing stocks of R&D and organizational capital. The stocks are the sum or past investment adjusted for depreciation. We estimate that 2008 R&D depreciation was 2,078 million Euros and the depreciation of organizational capital was 1,648 million Euros (for PHARMA, the figures were 1,244 million Euros and 1,217 million Euros on average in 2008, respectively; for IT, they were 2,843 million Euros and 1,255 million Euros). We also estimate that, for ALL companies, the 2008 R&D stock was 14,479 million Euros and the stock of organizational capital was 5,256 million Euros. As a result, total assets increased from 56,145 million Euros to 70,624 million Euros. Since liabilities stayed the same, equity increased from 15,529 to 30,183 million Euros. The gap between market-to-book value gap decreased from 48% of market to a position in which total equity exceeds market value by 10%. In other words, the value of the companies in our sample measured according to the investment cost exceeds what the market is willing to pay for the companies. This could indicate some degree of measurement error (highly likely but unclear in sign or magnitude). Also it is most likely due to the fact that 2008 was a terrible year in the stock market, a year dominated by the mark-to-market controversy in which the intrinsic value of assets was widely believed to be under-valued by the equity markets.

Similar results were obtained for the German PHARMA companies. The average R&D stock was 9,051 million Euros and the stock of organizational capital was 5,618 million Euros on average; after including intangible capital, the gap between book value and market value decreased from 45% of market value to an excess over market value of 19%. By comparison, the corresponding numbers for the updated (2008) HH sample of PHARMA show that the gap went from 71 percent to zero (Table 5). For the German IT companies in Table 7, the gap decreased from 34% of market value to 2%.

V. Comparison and Conclusions

Subject to all the necessary caveats, and there are many, the following conclusion emerges from our comparison of German and U.S. companies: when R&D and organizational intangibles are treated as capital, they have a large impact on the income statements and balance sheets of companies in both countries. In Germany, shareholder equity is increased by 265 percent (from 8,914 millions Euros), while in the U.S. the 2006 figure is 241 percent. Of course, the fact that intangibles *can* explain most (or all) of the market-to-book gap does not necessarily mean that they *actually do* explain the gap. However, when combined with the evidence surveyed by HH that suggests that intangible expenditures are indeed capital, our results imply that intangibles are an important factor determining the value of companies on both sides of the Atlantic. Moreover, the current practice of largely omitting them from financial statements leads to a biased perspective about the drivers of company value.

A look at Table 8 suggests that the inclusion of intangible capital lowers the rate of return on equity. If we use the traditional financial statements, that is, without intangibles, the rate of return for German pharmaceutical firms is 0.08, while that for American pharmaceutical firms is 0.21. When the missing intangibles are included, the rate of return for German pharmaceutical firms falls to 0.07, while that for American pharmaceutical firms drops to 0.11. We get similar results for IT firms. Note here the smaller returns for the German firms.

The inclusion of intangibles also lowers debt-equity ratios. In the traditional financial statements, the debt-equity ratio for German pharmaceutical firms is 1.64, while that for American pharmaceutical firms is 1.19. If we include intangible assets, debt to equity ratio for German pharmaceutical firms is 0.62, while that for American pharmaceutical firms is 0.34. We get similar results for IT firms. Note again the larger debt-equity ratios for the German firms.

German firms invest less in intangible assets than American firms. German pharmaceutical firms invested 12% of sales in R&D and 11% of sales in organizational capital, while American pharmaceutical firms invested 26% of sales in R&D and 14% of sales in organizational capital. German IT firms invested 8% of sales in R&D and 5% of sales in organizational capital, while American IT firms

invested 10% of sales in R&D and 11% of sales in organizational capital. Similarly, costs on intangible assets account for a larger share of total costs in German firms than in American firms.

As a result of the smaller investment flows, the German firms have less intangible asset stocks than American firms. For pharmaceutical firms, intangible assets account for 39% of total assets for German firms and 54% for American firms. R&D capital accounts for 24% of total assets in German pharmaceutical firms and accounts for 39% of total assets in American pharmaceutical firms. Organizational capital accounts for 15% of total assets in both German and American pharmaceutical firms. For IT firms, intangible assets account for 38% of total assets for German firms and 43% for American firms. R&D capital accounts for 29% of total assets in German IT firms and accounts for 26% of total assets in American IT firms. Organizational capital accounts for 9% of total assets in German IT firms and 17 in American IT firms.

These comparisons must be taken with a dose of caution. German firms operate in different environment from American firms, and produce different product mixes. For example, pharmaceutical products accounted for 53% of total sales for German pharmaceutical companies and account for 71% for American pharmaceutical companies. That difference alone may explain why German pharmaceutical firms are less R&D intensive than American pharmaceutical firms. Moreover, IT firms have very different products from each other, so it is hard to tell whether German IT firms are comparable to American IT firms. SAP and Oracle focus on software and software services. Infineon sells automotive products and communication products. Siemens makes products targeting industry, energy and healthcare. Apple sells mostly Mac, iPod and iPhone. Intel sells semiconductors. IBM has an IT segment as well as a financial segment.

Finally, the samples involved in these comparisons are small. One direction for future research is to broaden the German sample to the point of comparability with the larger samples for the U.S. Another is to extend the German data backward in time to get a workable time series that is suitable for comparison.

This said, the main result is unlikely to change: intangible capital matters a lot for the valuation of companies.

Table 2
"New View" Income Statement¹
Based on 12 Company Average
2008 (€ millions)

	Trad. ²	+R&D ²	+Org C. ²
1. Conventional Revenue	42,127	42,127	42,127
2. Own Production of R&D³	0	2,058	2,058
3. Own Production of Org. Cap.³	0	0	1,453
4. Total Adjusted Revenue (L1+L2+L3)	42,127	44,185	45,637
5. Conventional Cost of Revenue	30,938	30,938	30,938
6. Current Cost R&D⁴	1,744	1,744	1,744
7. Current Cost of SG&A⁴	4,041	4,041	4,041
8. Total Current Cost (L5+L6+L7)	36,723	36,723	36,723
9. Operating Surplus (L4-L8)	5,404	7,462	8,914
10. Depreciation already accounted for⁵	2,459	2,459	2,459
11. Amortization of Own R&D⁶	0	2,078	2,078
12. Amortization of Own Org. Cap.⁶	0	0	1,648
13. Adj. Operating Surplus (L9-L10-L11-L12)	2,945	2,925	2,729
14. Net Interest and Other Adjustments	-437	-437	-437
15. Before-Tax Income (L13-L14)	2,508	2,488	2,293
16. Income Tax Paid⁷	804	804	804
17. After-Tax Income	1,584	1,566	1,385
18. Earnings per Share	2.69	2.66	2.35

Note 1: Based on annual reports and authors' calculations. Detail may not add up due to rounding error.

Note 2: Column 1, designated "traditional", contains conventional financial data from annual reports; Column 2, designated "+R&D", adds R&D data to the data of column 1; Column 3, designated "+ Org Capital", adds organizational capital data to column 2.

Note 3: "Own Production of R&D" is shadow value of the investment in R&D made by the company. It is equal to current cost of R&D on line 6, all of which is considered to be a capital expenditure, plus markup for profit (imputed fraction of line 9 attributable to production of R&D). "Own Production of Org. Capital" is shadow value of the investment in organizational capital made by the company. It is equal to approximately 30% of current SG&A costs on line 7, the portion considered to be a capital expenditure, plus markup for profit (imputed fraction of line 9 attributable to production of organizational capital).

Note 4: Current cost of R&D (line 6) and organizational capital (line 7) is the outlay for labor and materials, plus applicable depreciation and amortization. This differs from the shadow values on lines 3 and 4 (see note 3).

Note 5: Conventional Depreciation and amortization are allocated to costs on lines 5 to 7. They are subtracted, here, in order to arrive at net income.

Note 6: The amortization of own R&D and organizational capital arises when these items are capitalized, as in columns 2 and 3. R&D is amortized over a 10 year useful life with a quasi-hyperbolic write-off pattern. Organizational capital is amortized over a 5 year useful life with a quasi-hyperbolic write-off pattern.

Note 7: Assumes that the implicit income from R&D and organizational capital is not taxed.

Table 3
"New View" Balance Sheet¹
Based on 12 Company Average
2008 (€millions)

CONVENTIONAL BALANCE SHEET²	Trad.³	+R&D³	+Org C.³
1. Current Assets	24,093	24,093	24,093
2. Plant and Equipment	8,206	8,206	8,206
3. Purchased Intangibles	5,636	5,636	5,636
4. Goodwill	2,758	2,758	2,758
5. Other Assets	15,616	15,616	15,616
6. Total Assets (L1+L2+L3+L4+L5)	56,310	56,310	56,310
7. Total Liabilities	40,615	40,615	40,615
8. Equity	15,529	15,704	15,580
ADJUSTMENTS FOR OWN INTANGIBLES			
9. R&D capital⁴	0	14,479	14,479
10. Organizational Capital⁴	0	0	5,256
11. Assets adj. for Own Intang. (L6+L9+L10)	56,145	70,624	75,880
12. Equity adj. for Own Intang. (L8+L9+L10)	15,529	30,183	35,315
COMPANY VALUATION			
13. Market Value of Equities⁵	32,053	32,053	32,053
14. Financial Value of Firm (L13+L7)⁶	72,668	72,668	72,668
15. Core Finan. Value of Firm (L14-L1-L5)	32,959	32,959	32,959
16. Core Assets (L11-L1-L5)	16,436	30,915	36,171
17. Total Intangible Assets (L3+L4+L9+L10)	8,394	22,873	28,129
VALUATION RATIOS			
18. Tobin's equity Qe (L13/L12)	2.06	1.06	0.91
19. Percent MV Value Explained (1/Qe)	0.48	0.94	1.10

Note 1: Based on annual reports and authors' calculations. Detail may not add up due to rounding error.

Note 2: Conventional balance sheet items recorded at historical cost.

Note 4: See note 2 of Table 1

Note 4: See note 2 of Table 1 for amortization assumptions. Note also that valuation of intangibles is at current, not historical, cost.

Note 5: Average monthly market value of outstanding equities.

Note 6: Average monthly market value of outstanding equities plus balance sheet liabilities.

Table 4
"New View" Income Statement¹

	Average of Pharma (Bayer, Merck, Stada) 2008 (€millions)			Average of Pharma (J&J, Pfizer, Schering- Plough, Bristol Myer, Eli Lilly and Wyeth) 2008 (\$ billions)		
	Trad. ²	+R&D ²	+Org C. ²	Trad. ²	+R&D ²	+Org C. ²
1. Conventional Revenue	14,041	14,041	14,041	34.24	34.24	34.24
2. Own Production of R&D³	0	1,706	1,706	0.00	8.90	8.90
3. Own Production of Org. Cap.³	0	0	1,585	0.00	0.00	4.82
4. Total Adjusted Revenue (L1+L2+L3)	14,041	15,746	17,332	34.24	43.14	47.95
5. Conventional Cost of Revenue	6,422	6,422	6,422	7.49	7.49	7.49
6. Current Cost R&D⁴	1,310	1,310	1,310	5.80	5.80	5.80
7. Current Cost of SG&A⁴	3,351	3,351	3,351	9.47	9.47	9.47
8. Total Current Cost (L5+L6+L7)	11,083	11,083	11,083	22.76	22.76	22.76
9. Operating Surplus (L4-L8)	2,958	4,664	6,249	11.48	20.38	25.19
10. Depreciation already accounted for⁵	1,339	1,339	1,339	2.07	2.07	2.07
11. Amortization of Own R&D⁶	0	1,244	1,244	0	4.55	4.55
12. Amortization of Own Org. Cap.⁶	0	0	1,217	0	0	4.12
13. Adj. Operating Surplus (L9-L10-L11-L12)	1,619	2,081	2,449	9.41	13.76	14.45
14. Net Interest and Other Adjustments	-605	-605	-605	-2.24	-2.24	-2.24
15. Before-Tax Income (L13-L14)	1,013	1,475	1,844	7.16	11.51	12.20
16. Income Tax Paid⁷	287	287	287	1.79	1.79	1.79
17. After-Tax Income	722	1,184	1,552	5.37	9.72	10.41
18. Earnings per Share	1.76	3.75	5.03	2.08	3.77	4.04

Note 1: Based on annual reports and authors' calculations. Detail may not add up due to rounding error.

Note 2: Column 1, designated "traditional", contains conventional financial data from annual reports; Column 2, designated "+R&D", adds R&D data to the data of column 1; Column 3, designated "+ Org Capital", adds organizational capital data to column 2.

Note 3: "Own Production of R&D" is shadow value of the investment in R&D made by the company. It is equal to current cost of R&D on line 6, all of which is considered to be a capital expenditure, plus markup for profit (imputed fraction of line 9 attributable to production of R&D). "Own Production of Org. Capital" is shadow value of the investment in organizational capital made by the company. It is equal to approximately 30% of current SG&A costs on line 7, the portion considered to be a capital expenditure, plus markup for profit (imputed fraction of line 9 attributable to production of organizational capital).

Note 4: Current cost of R&D (line 6) and organizational capital (line 7) is the outlay for labor and materials, plus applicable depreciation and amortization. This differs from the shadow values on lines 3 and 4 (see note 3).

Note 5: Conventional Depreciation and amortization are allocated to costs on lines 5 to 7. They are subtracted, here, in order to arrive at net income.

Note 6: The amortization of own R&D and organizational capital arises when these items are capitalized, as in columns 2 and 3. R&D is amortized over a 10 year useful life with a quasi-hyperbolic write-off pattern. Organizational capital is amortized over a 5 year useful life with a quasi-hyperbolic write-off pattern.

Note 7: Assumes that the implicit income from R&D and organizational capital is not taxed.

Table 5
"New View" Balance Sheet¹

	Average of Pharma (Bayer, Merck, Stada) 2008 (€millions)			Average of Pharma (J&J, Pfizer, Schering- Plough, Bristol Myer, Eli Lilly and Wyeth) 2008 (\$ billions)		
	Trad. ²	+R&D ²	+Org C. ²	Trad. ²	+R&D ²	+Org C. ²
CONVENTIONAL BALANCE SHEET²						
1. Current Assets	7,525	7,525	7,525	24.20	24.20	24.20
2. Plant and Equipment	4,080	4,080	4,080	10.02	10.02	10.02
3. Purchased Intangibles	7,718	7,718	7,718	6.84	6.84	6.84
4. Goodwill	3,539	3,539	3,539	9.24	9.24	9.24
5. Other Assets	1,336	1,336	1,336	6.59	6.59	6.59
6. Total Assets (L1+L2+L3+L4+L5)	23,542	23,542	23,542	56.88	56.88	56.88
7. Total Liabilities	14,627	14,627	14,627	30.93	30.93	30.93
8. Equity	8,914	8,915	8,916	25.95	25.95	25.95
ADJUSTMENTS FOR OWN INTANGIBLES						
9. R&D capital ⁴	0	9,051	9,051	0	47.33	47.33
10. Organizational Capital ⁴	0	0	5,618	0	0	17.85
11. Assets adj. for Own Intang. (L6+L9+L10)	23,542	32,593	38,211	56.88	104.21	122.06
12. Equity adj. for Own Intang. (L8+L9+L10)	8,914	17,966	23,585	25.95	73.28	91.13
COMPANY VALUATION						
13. Market Value of Equities ⁵	19,761	19,761	19,761	90.97	90.97	90.97
14. Financial Value of Firm (L13+L7) ⁶	34,389	34,389	34,389	121.90	121.90	121.90
15. Core Finan. Value of Firm (L14-L1-L5)	25,527	25,527	25,527	91.11	91.11	91.11
16. Core Assets (L11-L1-L5)	14,680	23,732	29,349	26.09	73.42	91.27
17. Total Intangible Assets (L3+L4+L9+L10)	11,258	20,309	25,927	16.07	63.40	81.25
VALUATION RATIOS						
18. Tobin's equity Qe (L13/L12)	2.22	1.10	0.84	3.51	1.24	1.00
19. Percent MV Value Explained (1/Qe)	0.45	0.91	1.19	0.29	0.81	1.00

Note 1: Based on annual reports and authors' calculations. Detail may not add up due to rounding error.

Note 2: Conventional balance sheet items recorded at historical cost.

Note 4: See note 2 of Table 1

Note 4: See note 2 of Table 1 for amortization assumptions. Note also that valuation of intangibles is at current, not historical, cost.

Note 5: Average monthly market value of outstanding equities.

Note 6: Average monthly market value of outstanding equities plus balance sheet liabilities.

Table 6
"New View" Income Statement¹

	Average of IT(Infineon, SAP and Siemens) 2008 (€millions)			Average of IT (Oracle, Apple, Intel, IBM, HP, Cisco and EMC) 2008 (\$ billions)		
	Trad. ²	+R&D ²	+Org C. ²	Trad. ²	+R&D ²	+Org C. ²
1. Conventional Revenue	31074	31074	31074	52701	52701	52701
2. Own Production of R&D³	0	2399	2399	0	5218	5218
3. Own Production of Org. Cap.³	0	0	1648	0	0	5681
4. Total Adjusted Revenue (L1+L2+L3)	31074	33473	35121	52701	57919	63599
5. Conventional Cost of Revenue	21045	21045	21045	28106	28106	28106
6. Current Cost R&D⁴	2055	2055	2055	3737	3737	3737
7. Current Cost of SG&A⁴	4828	4828	4828	9431	9431	9431
8. Total Current Cost (L5+L6+L7)	27929	27929	27929	41275	41275	41275
9. Operating Surplus (L4-L8)	3146	5545	7193	11426	16644	22324
10. Depreciation already accounted for⁵	1431	1431	1431	2444	2444	2444
11. Amortization of Own R&D⁶	0	2843	2843	0	3366	3366
12. Amortization of Own Org. Cap.⁶	0	0	1255	0	0	4113
13. Adj. Operating Surplus (L9-L10-L11-L12)	1714	1270	1663	8981	10833	12401
14. Net Interest and Other Adjustments	94	94	94	-178	-178	-178
15. Before-Tax Income (L13-L14)	1808	1364	1756	8803	10655	12222
16. Income Tax Paid⁷	617	617	617	2258	2258	2258
17. After-Tax Income	1483	1039	1432	6545	8396	9964
18. Earnings per Share	1.57	1.10	1.52	1.94	2.50	2.96

Note 1: Based on annual reports and authors' calculations. Detail may not add up due to rounding error.

Note 2: Column 1, designated "traditional", contains conventional financial data from annual reports; Column 2, designated "+R&D", adds R&D data to the data of column 1; Column 3, designated "+ Org Capital", adds organizational capital data to column 2.

Note 3: "Own Production of R&D" is shadow value of the investment in R&D made by the company. It is equal to current cost of R&D on line 6, all of which is considered to be a capital expenditure, plus markup for profit (imputed fraction of line 9 attributable to production of R&D). "Own Production of Org. Capital" is shadow value of the investment in organizational capital made by the company. It is equal to approximately 30% of current SG&A costs on line 7, the portion considered to be a capital expenditure, plus markup for profit (imputed fraction of line 9 attributable to production of organizational capital).

Note 4: Current cost of R&D (line 6) and organizational capital (line 7) is the outlay for labor and materials, plus applicable depreciation and amortization. This differs from the shadow values on lines 3 and 4 (see note 3).

Note 5: Conventional Depreciation and amortization are allocated to costs on lines 5 to 7. They are subtracted, here, in order to arrive at net income.

Note 6: The amortization of own R&D and organizational capital arises when these items are capitalized, as in columns 2 and 3. R&D is amortized over a 10 year useful life with a quasi-hyperbolic write-off pattern. Organizational capital is amortized over a 5 year useful life with a quasi-hyperbolic write-off pattern.

Note 7: Assumes that the implicit income from R&D and organizational capital is not taxed.

Table 7
"New View" Balance Sheet¹

	Average of IT(Infineon, SAP and Siemens) 2008 (€millions)			Average of IT (Oracle, Apple, Intel, IBM, HP, Cisco and EMC) 2008 (\$ billions)		
	Trad. ²	+R&D ²	+Org C. ²	Trad. ²	+R&D ²	+Org C. ²
CONVENTIONAL BALANCE SHEET²						
1. Current Assets	17862	17862	17862	31394	31394	31394
2. Plant and Equipment	4658	4658	4658	7601	7601	7601
3. Purchased Intangibles	2305	2305	2305	3162	3162	3162
4. Goodwill	10490	10490	10490	13161	13161	13161
5. Other Assets	6664	6664	6664	7971	7971	7971
6. Total Assets (L1+L2+L3+L4+L5)	38482	38482	38482	63288	63288	63288
7. Total Liabilities	26221	26221	26221	37153	37153	37153
8. Equity	12261	12961	12462	26135	26135	26135
ADJUSTMENTS FOR OWN INTANGIBLES						
9. R&D capital ⁴	0	17574	17574	0	29622	29622
10. Organizational Capital ⁴	0	0	5375	0	0	19384
11. Assets adj. for Own Intang. (L6+L9+L10)	38482	56056	61431	63288	92910	112294
12. Equity adj. for Own Intang. (L8+L9+L10)	12261	30535	35411	26135	55757	75141
COMPANY VALUATION						
13. Market Value of Equities ⁵	35974	35974	35974	108303	108303	108303
14. Financial Value of Firm (L13+L7) ⁶	62194	62194	62194	145457	145457	145457
15. Core Finan. Value of Firm (L14-L1-L5)	37668	37668	37668	106092	106092	106092
16. Core Assets (L11-L1-L5)	13956	31530	36905	23923	53545	72929
17. Total Intangible Assets (L3+L4+L9+L10)	12795	30369	35744	16323	45945	65328
VALUATION RATIOS						
18. Tobin's equity Qe (L13/L12)	2.93	1.18	1.02	4.14	1.94	1.44
19. Percent MV Value Explained (1/Qe)	0.34	0.85	0.98	0.24	0.51	0.69

Note 1: Based on annual reports and authors' calculations. Detail may not add up due to rounding error.

Note 2: Conventional balance sheet items recorded at historical cost.

Note 4: See note 2 of Table 1

Note 4: See note 2 of Table 1 for amortization assumptions. Note also that valuation of intangibles is at current, not historical, cost.

Note 5: Average monthly market value of outstanding equities.

Note 6: Average monthly market value of outstanding equities plus balance sheet liabilities.

Table 8: Comparison of U.S. and German Companies on Several Key Dimensions

	IT		PHARMA	
	US '08	GER '08	US '08	GER '08
MCAP/EQ W/O INTANG	4.14	2.93	3.51	2.22
MCAP/EQ W/ INTANG	1.44	1.02	1.00	0.84
ROE W/O INTANG	0.25	0.12	0.21	0.08
ROE W/ INTANG	0.13	0.04	0.11	0.07
DEBT/EQUITY W/O INTANG	1.42	2.14	1.19	1.64
DEBT/EQUITY W/ INTANG	0.49	0.74	0.34	0.62
R&D INV/SALES	0.10	0.08	0.26	0.12
ORG INV/SALES	0.11	0.05	0.14	0.11
R&D COST/TOTAL COST	0.09	0.07	0.25	0.12
ORG COST/TOTAL COST	0.23	0.17	0.42	0.30
CONV ASSETS/TOT ASSETS	0.56	0.63	0.47	0.62
R&D ASSETS/TOT ASSETS	0.26	0.29	0.39	0.24
ORG ASSETS/TOT ASSETS	0.17	0.09	0.15	0.15

Table 9: Shares of Pharmaceutical Products

Company	Share of revenues (pharmaceuticals/total)
Germany	
Bayer	47%
Merck	72%
Stada	100%
Pharma	53%
US	
ABT	61%
Bristol	86%
Eli Lilly	100%
J&J	40%
Pfizer	92%
Wyeth	83%
Pharma	71%

Source: Annual Reports 2008.

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Appendix

1. Other selected Areas with significant differences US GAAP - IFRS

Table A.1: Treatment of Inventory under US GAAP and IFRS (IAS 2)

IFRS	US GAAP
<ul style="list-style-type: none"> • Generally inventories are measured at the lower of cost and net realisable value. • Cost includes all direct expenditure to get inventory ready for sale, including attributable overheads. • Decommissioning and restoration costs incurred through the production of inventory are included in the cost of that inventory. • The cost of inventory generally is determined using the FIFO (first-in, first-out) or weighted average cost method. The use of the LIFO (last-in, first-out) method is prohibited. • Other cost formulas, such as the standard cost or retail method, may be used if the result approximates actual cost. • The same cost formula is applied to all inventories having a similar nature and use to the entity. • Net realisable value is the estimated selling price less the estimated costs of completion and sale. 	<ul style="list-style-type: none"> • Unlike IFRSs, generally inventories are measured at the lower of cost and market. • Like IFRSs, cost includes all direct expenditure to get inventory ready for sale, including attributable overheads. • Unlike IFRSs, asset retirement obligations incurred through the production of inventory are added to the carrying amount of the related item of property, plant and equipment. • Unlike IFRSs, the cost of inventory can be determined using the LIFO method in addition to the FIFO or weighted average method. • Like IFRSs, the standard cost or retail method may be used if the result approximates actual cost. • Unlike IFRSs, the same cost formula need not be applied to all inventories having a similar nature and use to the entity. • Unlike IFRSs, “market” is replacement cost limited by net realisable value (ceiling) and net realisable value less a normal profit margin (floor). Like IFRSs, net realisable value is the estimated selling price less the estimated costs of completion and sale.

Source: KPMG (2008): IFRS compared to U.S. GAAP: An overview

Table A.2: Treatment of Property, Plant, and Equipment under US GAAP and IFRS
(IAS 16)

IFRS	US GAAP
<ul style="list-style-type: none"> • <i>Property, plant and equipment is recognised initially at cost.</i> • <i>Cost includes all expenditure directly attributable to bringing the asset to the location and working condition for its intended use.</i> • <i>Cost includes the cost of dismantling and removing the asset and restoring the site.</i> • <i>Changes to an existing decommissioning or restoration obligation generally are added to or deducted from the cost of the related asset and depreciated prospectively over its remaining useful life.</i> • <i>Property, plant and equipment is depreciated over its useful life.</i> • <i>An item of property, plant and equipment is depreciated even if it is idle, but not if it is held for sale.</i> • <i>Property, plant and equipment may be revalued to fair value if fair value can be measured reliably.</i> 	<ul style="list-style-type: none"> • <i>Like IFRSs, property, plant and equipment is recognized initially at cost.</i> • <i>Like IFRSs, cost includes all expenditure directly attributable to bringing the asset to the location and working condition for its intended use.</i> • <i>Like IFRSs, cost includes the cost of dismantling and removing the asset and restoring the site.</i> • <i>Like IFRSs, changes to an existing decommissioning or restoration obligation generally are added to or deducted from the cost of the related asset and depreciated prospectively over its remaining useful life.</i> • <i>Like IFRSs, property, plant and equipment is depreciated over its useful life.</i> • <i>Like IFRSs, an item of property, plant and equipment is depreciated even if it is idle, but not if it is held for sale.</i> • <i>Unlike IFRSs, estimates of useful life and residual value, and the method of depreciation, are reviewed only when events or changes in circumstances indicate that the current estimates or depreciation method no longer are appropriate.</i> • <i>Unlike IFRSs, component accounting is permitted but not required.</i> • <i>Unlike IFRSs, the revaluation of property, plant and equipment is not permitted.</i>

Source: KPMG (2008): IFRS compared to U.S. GAAP: An overview

Table A.3: Treatment of Impairment of Assets under US GAAP and IFRS (IAS 36)

IFRS	US GAAP
<ul style="list-style-type: none"> • The impairment standard deals with the impairment of a variety of non-financial assets, including property, plant and equipment, intangible assets and goodwill; investment property and biological assets carried at cost less accumulated depreciation; and investments in subsidiaries, joint ventures and associates. • Impairment testing is required when there is an indicator of impairment. • Annual impairment testing is required for goodwill, and intangible assets that either are not yet available for use or have an indefinite useful life. This impairment test may be performed at any time during an annual reporting period provided that it is performed at the same time each year. • Goodwill is allocated to cash-generating units (CGUs) or groups of CGUs that are expected to benefit from the synergies of the business combination from which it arose. • A CGU is the smallest group of assets that generates cash inflows from continuing use that largely are independent of the cash inflows of other assets or groups thereof. • Whenever possible an impairment test is performed for an individual asset. Otherwise assets are tested for impairment in CGUs. Goodwill always is tested for impairment at the level of a CGU or a group of CGUs. 	<ul style="list-style-type: none"> • Unlike IFRSs, goodwill is allocated to reporting units (RUs) that are expected to benefit from the synergies of the business combination from which it arose. • Unlike IFRSs, an RU is defined as an operating segment or one level below an operating segment. • Unlike IFRSs, an asset group is the lowest level for which there are identifiable cash flows that largely are independent of the cash flows (rather than cash inflows) of other groups of assets. • Unlike IFRSs, the carrying amount of goodwill is not grossed up for impairment testing if minority interests are present. • Unlike IFRSs, an impairment loss is recognized for assets other than goodwill and identifiable intangibles with indefinite lives only if the asset's (asset group's) carrying amount is less than the undiscounted cash flows of the asset or asset group. The impairment loss is calculated based on the fair value of the asset (asset group), unlike IFRSs. Unlike IFRSs, an impairment loss is recognized for goodwill if the fair value of the RU is less than its carrying amount, and for an indefinite lived identifiable intangible asset if its fair value is less than its carrying amount. • Unlike IFRSs, the cash flows used to assess recoverability are not discounted. • Unlike IFRSs, an impairment loss for an asset group is allocated pro rata to assets in the asset group, which excludes goodwill, corporate assets and indefinite-lived intangible assets. • Unlike IFRSs, the revaluation of property, plant and equipment and intangible assets is not permitted; therefore all impairment losses are recognized in profit or loss. • Unlike IFRSs, reversals of impairments are prohibited.

Source: KPMG (2008): IFRS compared to U.S. GAAP: An overview