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Long-Lived Asset Impairments in the Shipping Industry and the Impact on Financial Statement Ratios: Comparing U.S. GAAP and IFRS Standards

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Abstract

In this paper, we investigate asset impairment standards particularly as they relate to differences between United States generally accepted accounting principles (US GAAP) and international financial reporting standards (IFRS) for the impairment of long-lived assets in the shipping industry and the corresponding impact on financial statement analysis ratios. Our study provides evidence that return on assets and asset turnover ratios diverge significantly as a result of the difference between US GAAP and IFRS on asset impairments within the shipping industry. Reporting differences between US GAAP and IFRS can impede the comparability of financial reporting. Asset impairment accounting differences can have significant differences for companies reporting under these two accounting standards.

Keywords: Asset impairment, financial statement ratios, IFRS

1. Introduction

During the period leading up to the 2008 stock market crash asset prices boomed. This stock market crash and the accompanying worst global economic recession since the legendary "crash of 1929"have significantly decreased asset values. The accounting for asset impairments has taken new meaning and significance. In this paper, we investigate asset impairment standards particularly as they relate to differences between United States generally accepted accounting principles (US GAAP) and international financial reporting standards (IFRS).As a case in point, the impairment of long-lived assets in the shipping industry and the corresponding impact on financial statement analysis ratios were analyzed. Comparing the financial statement ratios of companies in the same industry is extremely valuable. This comparison, however, can be misleading when companies file financial statements using different reporting standards. This paper examines the limitations of financial statement ratios in evaluating the performance of companies due to a lack of comparability in financial reporting standards for the impairment of long-lived assets. Our study provides evidence that select financial statement ratios within the shipping industry diverge significantly as a result of the differences between US GAAP and IFRS for asset impairments. These differences impede the evaluation of companies in the same industry, but reporting under a different external reporting system.

A single set of high quality accounting standards has been the goal of the Financial Accounting Standards Board (FASB) and International Accounting Standards Board (IASB) for many years. The advantages of converging to a single set of financial standards are many and include the comparability of financial statements and consistent high quality financial statements regardless of filing jurisdiction. However, the Securities and Exchange Commission (SEC) has recently delayed the implementation of a formal roadmap from US GAAP to IFRS citing the cost of implementation to be a major factor (SEC, 2012). Without one universal set of accounting standards, financial statement reporting can yield results with limited comparability. These comparability issues makes it critical that one understand the differences between US GAAP and IFRS and the resulting impact on financial statement ratios. The accounting for asset impairments in the shipping industry provides a good case in point of how varying accounting standards impact financial statement ratios and impair comparability.

US GAAP requires companies to perform a two-step approach in accounting for the impairment of assets. First companies must perform a recoverability test which compares the carrying value of the asset to the sum of its future undiscounted cash flows. If the carrying value of the asset exceeds the sum of its future undiscounted cash flows, an impairment test must be performed. The impairment test values the asset at the lower of its carrying value or its fair value, and a loss is recognized for any amount by which the carrying value exceeds the fair value. For IFRS, a one step process is performed, requiring companies to test for impairment if certain indicators are present. The calculation of the impairment is that amount by which the carrying value exceeds the higher of (1) the fair value less cost to sell or (2) the present value of future cash flows. Significant differences arise when using a discounted cash flow model for IFRS and an undiscounted cash flow

model for US GAAP in the shipping industry, where the useful life of vessels is approximately 25 years.

1.1 The shipping industry – case in point

To test the differences in financial statement ratios between US GAAP and IFRS for the impairments of long-lived assets, we explored various industries experiencing significant declines in asset prices and chose the shipping industry for several reasons. First, the shipping industry is broken into three segments, dry bulk, tanker, and containers; each has experienced a significant boom and bust cycle during the last decade. The dry bulk segment transports coal, iron ore, and other dry materials while the tanker segment transports oil and gasoline, and the container segment transports finished goods. For instance, in the dry bulk segment a large ship during 2008 could be rented at a daily rate in excess of $200,000, and less than $5,000 per day during the winter of 2009. As daily rental rates plummeted, so did asset values. A large five-year old ship in 2007 could be sold for around $150 million and is now worth less than $40 million(Platou, 2011). The second reason the shipping industry was selected is the international focus of the industry, with approximately 40% of our sample filing financial statements using US GAAP, the remainder of the companies filing financial statements using IFRS. The presentation of operating and financial results varied among these two reporting standards, even though more than 80% of ships are flying "flags of convenience"(2011). An example of a "flag of convenience" would be when a U.S. publically listed company registers the vessel in a foreign country such as the Marshall Islands, Panama or Liberia. Owners often times chose to have a "flag of convenience" to avoid regulations in the owner's home country.

Within the context of this industry, the return on asset ratio revealed significant differences between those companies using US GAAP and those companies using IFRS. To further analyze those differences, the return on asset ratio was reduced to its two component pieces: the asset turnover and profit margin ratio. We find a significant relationship between asset turnover and required accounting standards for asset impairments. Companies filing financial statements using US GAAP have a lower asset turnover ratio than companies using IFRS, holding everything else constant. For the profit margin ratio, we do not find a significant relationship between profit margin ratios and required accounting standards for asset impairments. While these findings can be expected given the differences between US GAAP and IFRS on asset impairments, the results show the impact of the two accounting standards on the return on assets ratio and asset turnover ratio for firms in the shipping industry. The remainder of this paper is structured as follows. Section two presents the literature review. Section three presents the overview of the shipping industry. Section four discusses the sample and results. Section five concludes with contributions.

2. Literature Review

Asset impairments under both US GAAP and IFRS are intended to improve the information content of reported financial information and provide users of the financial statements with value-relevant information that more clearly reflects the underlying value of plant assets. Both standard setters contend that companies will use their private information about cash

flows, in determining asset impairments, to better reflect the underlying performance of the firm. Management is to determine the best estimate of future cash flows based on reasonable and supportable assumptions and projections, incorporating all available evidence and likelihood of possible outcomes for ranges of cash values. In so doing, management signals to the investing public internal information that may otherwise be unobservable. Levy and Lazrovich-Porat (1995) argued that signaling allows investors to make intelligible inferences about a firm's unobservable characteristics. Opponents of asset impairment loss accounting, however, suggest that managers may choose opportunistically to exploit their accounting discretion, resulting in impairments not adequately reflecting the firm's underlying economics.(Watts, 2003), for example, argues that "assessing impairment requires valuation of future cash flows. Because those future cash flows are unlikely to be verifiable and contractible, they, and valuation based on them, are likely to be manipulated." By exercising discretion inherent in the asset impairment standards, managers may, depending on their reporting incentives, overstate, understate, or simply not recognize an existing economic impairment by being selective with the underlying choices. Opportunistic behaviors, in absence of control by a strong corporate governance system, would be facilitated.

Moreover, the allocation of the cost of an asset over time through depreciation and the recognition of impairment losses are integrated. The greater the depreciation amounts, the less likely the asset will be impaired. That is, the recognition of an impairment loss is required if the asset's carrying value exceeds its "recoverable amount", which is defined differently under US GAAP and IFRS. Depreciation charges are advantageous to induce efficient long-term investment decisions. However, excess depreciation charges may prevent informative impairment losses in the future. This trade-off, as with the determination of cash flow, implies that management will use private information to properly match costs with revenues produced, and not adjust depreciation charges to avoid or trigger an asset impairment loss.

Managers may actually want to take an asset impairment loss. A loss can be seen by shareholders as a signal that management is aware of the situation and is taking corrective steps to address the problem. Shareholders may not view these impairment losses as extremely negative, as they represent noncash charges. Management may use these impairment losses as a means to "cleanup" the balance sheet and recognize current losses so that the prospects of future profits are more favorable, consistent with the "big bath" theory. For example, when SFAS No. 121 was implemented, PepsiCo, Inc. in 1995 took a $520 million pretax charge, mostly related to its Taco Bell, Pizza Hut, and KFC restaurants. This write-off was 7% of its long-lived assets, and yet according to Wayne Calloway, PepsiCo's chairman, these restaurants had a good year and a dramatic improvement in their cash flows (Kreuze and Newell, 1997). This write-off nevertheless "gives companies [like PepsiCo] a blueprint for creating future earnings" according to Bear Stearns' Pat McConnell (Lowenstein, 1996).

The timing of these asset impairments is also interesting. In 1989 Fried, Schiff and Sondhi reported on a study conducted by the National Association of Accountants and the National Commission on Fraudulent Financial Reporting. The study focused on the impairments and

write-offs of long-lived assets. Results of the study indicated that the 4th quarter was the most frequently used period for disclosure of write-offs of impaired long-lived assets. The study concluded that write-offs of impaired long-lived assets were generally the result of environmental and industry factors rather than firm specific causes.

Ragothaman(1996) conducted an empirical study on the impact of asset impairment write-downs disclosures on stockholder wealth. Somewhat surprisingly the study found that the market reaction to write-downs of long-lived assets was positive. The author indicated the positive market reaction maybe because the market had previously adjusted to the reduced value of long-lived assets or the market looked favorably upon the actions of management in response to current market conditions.

Reinstein and Lander (2004) analyzed the impact of implementation of SFAS No. 144 on the impairment of long-lived assets. The authors conducted a survey to determine how key groups viewed the new financial reporting standard. The results were mixed as users of financial reports viewed the new standard more favorably than preparers of financial reports. In addition respondents expressed concern as to whether the new reporting requirements were cost justified. In a related study Reinstein and Bayou (2002) concluded that the requirements of SFAS 144 were important to the real estate industry because capital assets may need revaluation. And the ability to revalue assets would help financial statement users assess the effects of disposal transactions on ongoing operations.

In an article related to the accounting and disposal of long-lived assets under SFAS 144 requirements Rezaee, Spiceland and Agrawal (2003)cite a study conducted by Rezaee, Smith and Lindbeck(1996) under SFAS 121. These authors found that (1) companies reporting asset impairments recorded impairments equal up to 22 percent of sales, (2) that there was inconsistency in the measurement, recognition and write-downs of long-lived assets, and (3) the timing and amount of asset impairments were largely discretionary.

Riedl(2004)examined long-lived asset impairments prior to and subsequent to the issuance of SFAS 121, *Accounting for Impairment of Long-Lived Assets*. Empirical results found that economic factors had a weaker relationship to write-offs after SFAS 121. An interesting finding of this study was that there was a higher association of "big bath" behavior by companies after SFAS 121. Thus managers used SFAS 121 as an opportunity to write-down impaired long-lived assets.

Wu(2011)studied the influence of impaired asset policy on the quality of information disclosure across 12 different industries. The author found that impairment policy had an influence on the reported profit of a company but the influence was different from industry to industry. Wu concluded that impaired long-lived assets are calculated according to the characteristics in different industries in order to regulate impaired assets and the quality of accounting information provided to users.

Relevant results related to the impairment of long-lived assets were reported in a series of working papers. Gordon (2012)investigated the role of impairment of long-lived assets in predicting future performance under US GAAP and IFRS. The author found evidence that

impairments reported under IFRS are significantly associated with future earnings and cash flows and concluded impairment accounting standards under IFRS were more informative than GAAP about future performance. Trottier (2012) examined the effect of reversibility on a manager's decision to record asset impairments under IFRS. Empirical data based on an experimental study of 118 managers found that permitting managers to reverse write-downs of impaired assets significantly increased the likelihood that managers would record the impairment. In a 2013 working paper Siggelkow and Zulchconducted a sample of 1300 companies to examine the factors that influence write-offs of long-lived assets in Europe. The authors concluded that the write-off decision is driven by asset impairment while the magnitude of the dollar amount of the asset impairment seemed to be driven by earnings management.

2.1 Asset impairment under US GAAP

United States generally accepted accounting principles requires companies to perform a two-step test for impairment of long-lived assets. First, a long-lived asset shall be tested for recoverability whenever events or changes in circumstances indicate that its carrying amount may not be recoverable. Indicators of lack of recoverability could include decreases in the market prices of long-lived assets, a change in legal factors or business climate, a current period operating or cash flow loss as a result of the use of the long-lived asset or many other negative factors around the use of these long-lived assets (360-10-35).

Once an asset has been identified for possible impairment, companies are required to undergo a two-step process. The impairment test determines if the carrying amount of a long-lived asset exceeds the sum of the *undiscounted* cash flows expected to result from the use and eventual disposition of the asset(360-10-35). The assessment will be based on whether the asset is in use or under development. If the asset is considered impaired, the impairment loss is measured as the amount by which the carrying amount of the long-lived asset exceeds its fair value. An asset's fair value should initially be determined by quoted market prices in active markets, if available. Alternatively, the present value of future cash flows can be used to determine fair value. The rate used should be commensurate with the risks involved. Impairment charges are recorded as a separate line item on the income statement. After recording any impairment charge, the adjusted carrying amount becomes the new cost basis. The new cost basis will be depreciated over the remaining useful life of the asset. Reversals of prior impairments are prohibited under US GAAP. (360-10-35)

2.2 Asset impairment under IFRS

IAS 36 requires companies to review all assets on the balance sheet date to look for any indication that an asset may be impaired. Similar to US GAAP, IFRS provides indicators of impairment, including market value declines, changes in technology, markets or economy, and many others. If there is an indication of impairment, the company must calculate the asset's recoverable amount under IAS 36.9. Contrary to US GAAP, under IFRS, an asset's recoverable amount is defined as the higher of either the value in use, or the net sales price. Value in use is defined as the *discounted* present value of the future cash flows expected to arise from the continued use of an asset and its disposal at the end of its useful life. This

computation will undoubtedly be a lower value than that computed under US GAAP, for most assets in use.

The discount rate used in determining the value in use is the current market assessments of the time value of money and the risks specific to the asset. In addition, the following would normally be considered as factors in the discount rate, the entity's own weighted average cost of capital, the entity's incremental borrowing rate, and other market borrowing rates. Impairments are the amount by which the carrying value exceeds the higher of either the value in use or the net sales price.

Similar to US GAAP, impairments are recorded on the income statement and the new carrying value will be the basis for future years' depreciation. Unlike US GAAP, IFRS does allow for the reversal of impairments from prior years. Below is a table summarizing the differences in accounting for asset impairments between US GAAP and IFRS.

	US GAAP	IFRS
Method of determining impairment	Requires a two-step approach, with a recoverability test based on the sum of the undiscounted cash flows. If undiscounted cash flows are less than the carrying amount, an impairment loss is suggested.	One step approach that requires testing be performed if impairment indicators exist.
Calculation of impairment	The excess of the carrying value over the fair value as calculated in accordance with ASC 820.	The amount by which the carrying amount exceeds the recoverable amount. Recoverable amount is equal to the greater of the fair value less costs to sell and the present value of future cash flows in use.
Reversal of losses	Prohibited	Assets may be revalued to the newly estimated recoverable amount. Reversal may not exceed the initial carrying amount adjusted for depreciation.

In summary, US GAAP requires companies to use an undiscounted cash flow model in testing recoverability as opposed to a discounted cash flow model under IFRS. As assets in the shipping industry have long useful lives, the discounting of future cash flows makes those assets less likely to pass the recoverability test using IFRS. As a result, even though operating in similar, global shipping markets, with over 80% of ships flying a "Flag of

Convenience"(2011), companies filing under US GAAP are less likely to record impairments for long-lived assets as compared to those companies filing under IFRS.

3. Shipping Industry – More Specifics

The shipping industry provides an excellent opportunity to explore the difference between US GAAP and IFRS for the impairment of long-lived assets. Through 2008, the value of ships increased significantly. For example, a five-year old cape size vessel would have sold for over $150 million in early 2008 (Platou, 2011). The recession of 2008, however, has negatively impacted the shipping industry. The same five-year old cape size vessel decreased in value by 75% to $38 million in 2011[1]. In addition to the significant decrease in asset values, the revenue associated with the vessels also decreased significantly. Genco Shipping & Trading[2] for example, paid approximately $120 million each for9 cape size vessels (2007). These vessels remain on their balance sheet with book values of between $108 million and $117 million (2012). Comparing the carrying value on the balance sheet to the current market value for a similar vessel, we can calculate the difference in just these 9 vessels at over $500 million. This amount is economically significant as the total market cap for this company on 12-31-2011 was only about $280 million. Even with such a significant difference between the carrying value of these vessels and the current market value, this company has not recorded impairment under US GAAP.

This compares to Jinhui Shipping and Trading, a company filing under IFRS on the Oslo stock exchange in Norway that has recorded asset impairments of $74 million in 2010 and $25 million in 2011. These impairments have been recorded on the income statement as a result of the declining value of vessels. In calculating the in use value of their assets, the company used a discount rate of 7.35% at December 31, 2010 and 7.17% at December 31, 2011.

Table 1 illustrates the difference between US GAAP and IFRS in accounting for the impairment of long lived assets. In Panel A, we calculate the amount of revenue needed per day to meet the recoverability of the asset under the first test ofUS GAAP impairment standards. In Panel B, we take the same hypothetical asset from Panel A and apply the requirements under IFRS.

In arriving at the calculations of impairment under US GAAP and IFRS we must make several estimates. First, the *remaining useful life* of the asset purchased in 2007 is estimated to be 20 years. This is based on industry practices of a 25 year useful life for assets. Next, we estimate that the asset has a book value of $100 million. This estimate appears reasonable, as during 2007 and 2008, asset prices for a cape size vessel fluctuated between $100 and $160 million. Operating expenses were estimated at $5,800 per day, based on the 2011 Department of Transportation Comparison of U.S. and Foreign Flag Operating Costs[3](2011). Inflation present in revenue and operating expenses was estimated at 2% per

[1] Even accounting for depreciation of the asset over the 25 year life (20 years remaining) the carrying value on the balance sheet would be around 120 million.
[2] A US public company listed on the New York Stock Exchange
[3] The report also shows more than 80% of ships are flying a "Flag of Convenience", with over 30% of the world's fleet flying a Marshall Islands Flag.

year. We use the same inflation estimate between the US GAAP and the IFRS calculation. Lastly, as IFRS requires the net present value of cash flows, we use a 5% discount rate. If our discount rate were higher, that would increase the amount of required revenue per day, whereas a smaller discount rate would decrease the required revenue per day.

In panel A, we perform the recoverability test using the undiscounted cash flows. To avoid the impairment for the hypothetical asset, the sum of all undiscounted cash flows has to be greater than $100 million. Using operating expenses of $5,800 and inflation rate of 2% per year for revenues and expenses, we use goal seek to calculate the revenue per day in year 1. If the estimated revenue per day is greater than $17,076 an impairment would not be recorded for the asset under US GAAP.

Under IFRS, in Panel B, impairment is recognized if the carrying amount exceeds the recoverable amount. The recoverable amount is equal to the greater of the fair value less costs to sell or the present value of future cash flows in use. The fair value of these assets is roughly $40 million. To calculate the present value of future cash flows in use, we use the same operating expenses, remaining life, and inflation estimates as under US GAAP, but now use a discount rate of 5%. Under these assumptions, the required revenue per day in order to avoid impairment would be approximately $24,482, or 43% greater revenues.

Using the same estimates, a company filing financial reports under IFRS would be required to estimate significantly greater future revenues (or 43% higher) than a similar company filing financial statements under US GAAP in order to avoid an asset impairment. Through these varying standards, the comparability of financial statements between US GAAP and IFRS becomes more complicated as some companies record impairments while others do not, while operating in the same economic environment.

Table 1 – Panel A: US GAAP Calculation of Impairment of Long-Lived Assets

Remaining Useful Life	20 years				
Book Value	$100,000,000				
Inflation	2%				
Operating Exp. per Day	$5,800				
Revenue	$17,076				
Year	1	5	10	15	20
Revenue per Day	$17,076	$18,483	$20,407	$22,531	$24,876
Expenses per Day	5,800	6,278	6,932	7,653	8,450
Cash Flow per Day	11,276	12,205	13,476	14,878	16,427
Cash Flow Per Year	4,115,672	4,454,936	4,918,609	5,430,542	5,995,757
Total Cash Flow	$100,000,000				

Table 1 – Panel: B IFRS Calculation of Impairment of Long-Lived Assets

Remaining Useful Life	20 years				
Book value	$100,000,000				
Inflation	2%				
Operating Exp. per Day	$5,800				
Revenue	$24,482				
Discount Rate	5%				
Year	1	5	10	15	20
Revenue per Day	24,482	26,500	29,258	32,303	35,665
Expenses per Day	5,800	6,278	6,932	7,653	8,450
Cash Flow per Day	18,682	20,222	22,326	24,650	27,216
Cash Flow Per Year	6,818,770	7,380,856	8,149,061	8,997,222	9,933,660
Discounted Cash Flow per Year	6,494,067	5,783,094	5,002,817	4,327,818	3,743,892
Total Cash Flow	$100,000,000				

Note: This table presents a comparison of the calculation for impairment of long-lived asset under US GAAP (panel A) and IFRS (panel B). The revenue required per day in order to avoid an impairment loss is estimated. We use per day estimates since those are industry standards. *Remaining Useful Life* – Industry standards would suggest a 25 year useful life for vessels, for an asset purchased during the boom period of 2007-2008; this asset would have a remaining life of approximately 20 years. *Book Value* – We use a $100 million carrying value of our asset, this example would be reasonable given asset prices of up to $150 million during 2007-2008. *Inflation* – We estimate a2% inflation for operating expenses and revenue. *Operating Expense per Day* - We use an estimated operating expense per day of $5,800, taken from the 2011 U.S. Department of Transportation comparison of U.S. and Foreign Flag Operating Costs. The report shows 80% of the world fleet is operating under a "flag of convenience". *Revenue* – Is calculated to determine the amount of revenue required under each US GAAP and IFRS in order to avoid impairment. *Discount Rate* – as IFRS requires a net present value calculation of cash flow, we have estimated a discount rate of 5%. A higher discount rate would require companies filing under IFRS to have more revenue, while a lower discount rate would require less revenue to avoid asset impairment.

Based on estimates used by some companies, impairments may not be recorded. As a result,

analysts' and investors have to understand that balance sheet valuations may be overstated. For example, in the May 2013 Wells Fargo Securities analyst report for Genco Shipping & Trading analyst Mike Webber states "We are maintaining our Underperform rating while lowering our valuation range to $0-$0.50, from $1.00-2.50, based primarily on GNK's negative NAV (-$7/share), the likelihood of a significant restructuring/Chapter 11 that would leave little-no value to shareholders, and an operating outlook that shows few signs of providing meaningful support." This negative net asset value compares to a book value at December 31, 2012 of over $24 per share. Analysts and investors must have a thorough understanding of the implications of US GAAP and IFRS impairment standards when examining balance sheets and the impact of the impairment of long-lived assets.

4. Sample and Results

Our sample consists of all companies listed on the Bloomberg dry bulk, container and tanker indexes as of January 2011. It consists of approximately 70 companies and over 600 observations from 2002 to 2011. We exclude companies that do not have data on either Compustat North America or the Compustat Global database. The determination of each company's financial reporting standard is based on the classification given by Compustat. Due to data availability in the Compustat global file, it is difficult to analyze impairments of long-lived assets individually[4]. However, using the Compustat North America file within our sample, we are able to see no company filing under US GAAP has recorded asset impairments.

We have provided descriptive statistics for our sample in Table 2. The mean return on assets is approximately 7.6 percent with the 25th percentile at 1.5 percent and the 75th percentile at 13.1 percent. The profit margin for this industry has a mean of 19.5 percent with the 25thpercentile at 3.3 percent and the 75th percentile at nearly 35 percent. Approximately 37 percent of our sample files financial statements using US GAAP[5].

[4] Compustat Global includes the impairment of long-lived assets with several other items in a category called special items, and makes it impossible to break out the asset impairment piece individually.
[5] Variance Inflation Factors tested, all were below 3, and as a result multi-collinearity does not appear to be an issue.

Table 2: Descriptive Statistics for Dependent Variables and US GAAP

Variable	N	Mean	Median	Std. Dev.	Lower Quartile	Upper Quartile
Return on Assets	635	0.0768	0.0628	0.1161	0.0152	0.1310
Asset Turnover	635	0.5452	0.3900	0.4460	0.2194	0.7778
Profit Margin	635	0.1948	0.1273	0.6997	0.0331	0.3495
US GAAP	635	.3701	0	0.4832	0	1
US GAAP						
Return on Assets	235	0.0590	0.0533	0.1142	0.0060	0.1036
Asset Turnover	235	0.2765	0.2262	0.1814	0.1560	0.3433
Profit Margin	235	0.1948	0.2453	0.4141	0.0289	0.4324
IFRS						
Return on Assets	400	0.0872	0.0689	0.1161	0.0223	0.1399
Asset Turnover	400	0.7031	0.5822	0.4788	0.3331	0.9642
Profit Margin	400	0.1949	0.1149	0.8230	0.0372	0.2528

Note: This table presents descriptive statistics for our sample of firm years from 2002 until 2011, the top panel includes all companies. The middle panel includes only companies filing under US GAAP. The bottom panel includes companies filing under IFRS. **Return on Assets** is pre-tax income divided by total assets. **Asset Turnover Ratio** is total revenue divided by total assets. **Profit Margin** is pre-tax income divided by total revenue. **US GAAP** is an indicator variable of 1 if company files financial statements using US GAAP or a comparable local reporting standard based on Compustat declaration, 0 otherwise.

We examine the impact of accounting standards on the return on assets ratio within the shipping industry. We define return on assets as pre-tax income divided by total assets. Under US GAAP we anticipate fewer asset impairments and as a result predict higher total assets and a lower return on assets. We do not have a prediction for the impact of US GAAP on the numerator, pre-tax income[6]. If a company records an asset impairment it will lower the current year income, however will increase future years income as depreciation expense will be lower as a result of lower property, plant and equipment assets. We include year indicator variables to control for the significant impact of time over our sample period.US GAAP is an indicator variable of 1 if the company filed its annual report using US GAAP, 0 otherwise. Our model to test the impact of US GAAP on return on assets is listed below in equation 1;

$$Return\ on\ Assets_{it} = \beta_0 + \beta_1 Year_{it} + \beta_2 USGAAP_{it} + \varepsilon_{it} \quad (1)$$

We take the return on assets ratio (in equation 2) and split it into its two component pieces: profit margin and asset turnover ratio in equation 3 below. We then are able to test the

[6] We use pre-tax income as most companies have a zero percent tax rate as a result of the activity of shipping is conducted in international waters and can't be taxed by any taxing jurisdiction.

impact of US GAAP on profit margin (in equation 4) and also the asset turnover ratio (in equation 5). We do not have a prediction for the impact of US GAAP on profit margin as pretax income is going to be impacted by numerous factors, including choice of reporting standard, jurisdiction, manager compensation and so forth. The denominator, revenue, will not be impacted as the shipping industry acts like a global commodity. Lessors will strive to get the maximum amount, while lessees will try to reduce their shipping costs and rent the cheapest asset available. Within the industry there is little differentiating between vessels.For the asset turnover ratio, we again expect managers to attempt to maximize revenue regardless of reporting standard. As discussed above, we anticipate higher assets under US GAAP and as a result we anticipate a lower asset turnover ratio for those companies filing under US GAAP. We test this hypothesis in equation 5.

$$Return\ on\ Assets = \frac{Pretax\ Income}{Total\ Assets} \quad (2)$$

$$\text{Return on Assets} = \frac{Pretax\ Income}{Revenue}\ X\ \frac{Revenue}{Total\ Assets} \quad (3)$$

$$Profit\ Margin_{it} = \beta_0 + \beta_1 Year_{it} + \beta_2 USGAAP_{it} + \varepsilon_{it} \quad (4)$$

$$Asset\ Turnover\ Ratio_{it} = \beta_0 + \beta_1 Year_{it} + \beta_2 USGAAP_{it} + \varepsilon_{it} \quad (5)$$

First, in Table 3, Model 1 we examine the impact of financial reporting standards on the return on assets ratio using ordinary least squares. We find a significant association between a lower return on assets ratio and companies filing financial statements under US GAAP. This finding is especially interesting as the return on assets ratio is one of the most commonly used financial ratios in business. Careless investors may look at two companies and invest in the company with the highest return on assets ratio. This investment decision may be faulty as those higher returns may not reflect more favorable operating results but rather the financial reporting standard used. However, this finding can be difficult to interpret, as companies filing under US GAAP maybe reporting significantly lower net income, higher assets, or a combination of both. As discussed above, we then attempt to divide this interesting finding into the two component pieces: the asset turnover ratio and the profit margin. In Model 2 of Table 3, we examine the impact of financial standards on the asset turnover ratio we find a significant relationship between a lower asset turnover ratio and filing under US GAAP. This finding is interesting as companies are reporting a lower ratio simply based on the reporting standard. These findings are particularly interesting as comparability between company's financial statements in the same industry may be impacted by the reporting standard used by the company. This finding also provides insight into why the return on assets ratio in Model 1 is significant. As discussed previously, managers regardless of reporting standard will attempt to maximize revenue. The difference in reporting standard alone however could be impacting whether a company is recording asset

impairment or not, resulting in a difference in total assets reported. In Table 3, Model 3, we do not find a significant association between profit margin and firms filing under US GAAP. This finding is expected as we do not have a prediction for the impact of US GAAP on income, for some periods companies will record impairments which will lower income, in other periods they will report increased income as a result of having lower depreciation. Nevertheless, the study results indicate that financial statement users should consider the reporting standard used by the company when examining the asset turnover ratio and also the return on assets ratio.

Table 3: Regression Results for Asset Turnover Ratio

Variable	Model 1 – Return on Assets		Model 2 – Asset Turnover		Model 3 – Profit Margin
US GAAP	-0.0281	***	-0.4241	***	0.0113
	(-3.50)		(-15.93)		(0.30)
Year 2003	0.0563	***	0.0959		-0.2131
	(3.77)		(1.27)		(-0.65)
Year 2004	0.1653	***	0.1267		-0.0242
	(8.24)		(1.62)		(-0.07)
Year 2005	0.1155	***	0.0867		-0.0816
	(8.34)		(1.14)		(-0.25)
Year 2006	0.0652	***	0.0415		-0.1524
	(5.28)		(0.56)		(-0.47)
Year 2007	0.0976	***	0.0338		-0.0829
	(6.19)		(0.45)		(-0.25)
Year 2008	0.0588	***	0.0852		-0.2130
	(3.98)		(1.05)		(-0.65)
Year 2009	-0.0119		-0.1210	*	-0.2836
	(-0.90)		(-1.79)		(-0.87)
Year 2010	0.0082		-0.0978		-0.2872
	(0.81)		(-1.40)		(-0.88)
Year 2011	-0.0610	***	-0.1100		-0.5125
	(-3.70)		(-1.62)		(-1.55)
Constant	0.0397	***	0.6937	***	0.3861
	(4.81)		(12.28)		(1.15)
Adj. R Squared	.3128		.2536		.0432
Observations	635		635		635

*** p<.01, ** p<.05, * p<.10.t-statistics are in parenthesis. In Model 1 we present the regression results for return on assets. **Return on Assets** is pre-tax income divided by total assets. In Model 2 we present the regression results for the asset turnover ratio. **Asset Turnover Ratio** is total revenue divided by total assets. In Model 3 we present the regression

results for Profit Margin. **Profit Margin** is pre-tax income divided by total revenue. **US GAAP** is an indicator variable of 1 if company files financial statements using US GAAP or a comparable local reporting standard based on Compustat declaration, 0 otherwise. **Year** indicator variables are included.

5. Conclusions

The FASB and IASB have spent years examining how they can create a single set of high quality financial standards, while the SEC has recently delayed the implementation of IFRS in the United States due to the anticipated high cost. This paper examines a particular difference in the reporting of impairments in long-lived assets and its impact on the return on assets ratio in the shipping industry. Although operating in the same, global shipping industry, those companies filing under IFRS are more likely to have recorded impairments on long-lived assets and the balance sheets are going to resemble something closer to fair value as compared to those companies filing under US GAAP which can have assets on the financial statements that may only have a fair value of 25% of the carrying value of the asset.

Asset impairments under both US GAAP and IFRS are intended to improve the information content of reported financial information and provide users of the financial statements with value-relevant information that more clearly reflects the underlying value of plant assets. Both standard setters contend that companies will use their private information about cash flows, in determining asset impairments, to better reflect the underlying performance of the firm. Investors and creditors, however, must be cautious when reviewing asset impairments as managers may choose opportunistically to exploit their accounting discretion, resulting in impairments not adequately reflecting the firm's underlying economics. By exercising discretion inherent in the asset impairment standards, managers may, depending on their reporting incentives, overstate, understate, or simply not recognize an existing economic impairment by being selective with the underlying choices.

In addition to the findings presented in this paper, we have yet to see the impact of rising asset values after significant impairments. If the shipping industry where to experience another boom period, companies filing financial statements under IFRS would be allowed to reverse the impairment they had recorded in prior years. This difference would add an additional layer of complexity when comparing financial statements.

Asset impairments, from a regulatory perspective, have received increased attention. The Public Company Accounting Oversight Board (PCAOB), for example, found 123 audit deficiencies related to fair value estimates and asset impairments in 2010. For the Big Four audit firms (PricewaterhouseCoopers LLP, Deloitte LLP, Ernst & Ernst LLP and KPMG LLP) the agency found 31 audit deficiencies related to asset impairments in 2010, compared to 17 deficiencies in 2009. The PCAOB contends that "auditors in certain situations didn't provide enough scrutiny in terms of management's forecasts, or didn't look closely enough at the assumptions and methodologies that went into some of the modeling used by corporate pricing service," says Mark Zyla, a managing director at Acuitas (Chasan, 2012).

Comparable financial reporting demands that companies report their financial statements

under similar accounting standards. While US GAAP and IFRS are on the process of conversion differences remain. Asset impairments cause significant differences in the asset turnover and return on asset ratios for companies in the shipping industry under US GAAP and IFRS. These differences, among other unresolved differences, can impede financial statement analysis and investment decisions. We encourage these two Boards to continue on the convergence path to ensure more comparable financial reporting by companies, particularly those in the same industry.

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