

CHAPTER FOUR

Financial Statement Analysis

I think Southwest has a great model. They're used to efficiency. They bought new airplanes. They turned them (around) quickly on the ground. We loved the efficiency side of the business, but we thought they may be a little too much of a prisoner to their success.

-David Neeleman, the founder and former CEO of JetBlue Airways and also founder of Azul Linhas Aéreas Brasileiras.

Based on an understanding of airline financial statements, the analysis of the statements is performed using ratio analysis. Such financial indices as return on investment (ROI), profit margin, debt-equity ratio, and price-earnings ratio are used not only internally by airlines, but also externally by the investment community. Airline industry specific metrics, such as cost per available seat mile (CASM) and revenue per revenue passenger mile (RRPM), are also introduced. Using ratios and other financial analysis techniques, airline benchmarking of US carriers, is performed to help recognize strong financial airlines and to understand how they are successful by dissecting their financial statements.

- Financial ratio analysis
 - Profitability ratios
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While financial statements are essential in helping to analyze a company, they are merely the starting point for successful financial management. Financial statements provide the raw figures on the company's financial position; however, these numbers are only meaningful when compared to other firms competing in the industry. The various tools that are used to compare financial statements to assess a firm's financial condition and performance are commonly referred to as ratio analysis. Ratio analysis encompasses a wide variety of calculations and

metrics that enable a manager to quickly spot trends in the company's performance, highlighting historical performance and projections for the future.

Financial Ratio Analysis

There are two major comparisons that ratio analysis provides and these are comparisons of the firm across time and comparisons of the firm with the industry. Using ratio analysis, financial results can be standardized across time to help analyze a company's financial performance through various periods. This level of analysis is most effective when the time period of analysis is fairly short so that actions can be taken in response to any trends the company may be facing. The more powerful ratio analysis comparison is with other firms competing in the same industry. With financial statements readily available for all publicly-traded companies, benchmarking of competing firms can easily be undertaken to help understand a company's financial position within the industry. This benchmarking effectively enables firms to recognize their strengths and weaknesses relative to the industry and, since firms vary in size and composition, is only possible through the standardization that ratio analysis provides.

The various ratios used in the analysis can be classified into four categories based on what portion of the company that they are analyzing:

- Profitability ratios
- Liquidity ratios
- Long-term risk ratios
- Stock market ratios

Profitability ratios help describe the efficiency or success of the business. Liquidity ratios describe the firm's ability to meet short term obligations. Long-term risk ratios analyze the capital structure of a company and take a more macro-level approach to analyzing the company. Finally, stock market ratios deal specifically with publicly-traded companies and describe the company's position in the stock market. Regardless of the type of ratio used, a single ratio by itself does not accurately describe the firm; rather, a number of ratios should be used to help provide a broader perspective on the company. This point is exacerbated by the fact that there are multiple ratios that can be used to analyze the same part of the company. Therefore, there are no set criteria for which ratios to be used when analyzing a company; however, the more ratios that are used in the analysis, the better the picture that is painted of the company.

This chapter explains the various ratios that might be used in performing ratio analysis by using these ratios to analyze the financial statements of Southwest Airlines. While all the ratios can be used to adequately describe the financial position of a company, the uniqueness of the airline industry requires additional calculations to understand the finances of an airline. Finally, based on the common and airline-specific financial calculations, an exercise in the benchmarking of various US airlines is presented to show the merits of ratio analysis and to provide a better financial understanding of the airline industry.

Profitability Ratios

As mentioned previously, profitability ratios help describe the success of the business by comparing the profits (or losses) generated against a variety of baselines. This helps standardize the profits of companies, making it easier to compare the profitability of one company against the profitability of another company. While this comparison helps standardize large and small companies alike, it is not necessarily the most useful tool in comparing companies across multiple industries, since the industry dynamics can vastly distort how companies generate a profit. The five profitability ratios that will be explained for Southwest Airlines in 2006 are:

- Operating profit margin ratio
- Profit margin ratio
- Return on assets
- Return on equity
- Asset turnover ratio

Operating Profit Margin Ratio

The operating profit margin ratio compares the operating profit of a company to the total revenue generated. It enables a manager to determine how much operating profit is generated for every dollar of revenue. The operating profit margin can be particularly useful when analyzing a company as it excludes items such as interest expense and taxes, which are largely based on the macro-structure of the company. Excluding these items generally enables a greater in-depth analysis of the company's operations. Also, because we are excluding special items on the income statement in the calculation, this means that the operating profit margin ratio tends to remain more stable over time; the formula for calculating the operating profit margin ratio is:

$$\text{Operating Profit Margin} = \frac{\text{Operating Profit}}{\text{Total Revenue}}$$

Both items for calculating the gross profit margin ratio are found on the income statement. Operating profit is also commonly referred to as EBIT, or Earnings before Interest and Taxes. Referring back to chapter 3, the gross profit margin for Southwest Airlines in 2007 was actually calculated in the common-size income statement, since the third column contained most of the items as a percentage of total revenue. As a refresher, Southwest Airlines 2007 operating profit margin was:

$$\text{Operating Profit Margin} = \frac{\$791 \text{ million}}{\$9,861 \text{ million}} \times 100\% = 8.02\%$$

Based on the gross profit margin calculated above, every dollar of revenue generated by Southwest Airlines created roughly 8 cents of operating profit for the company. As a comparison, the gross profit margin for Southwest Airlines was 10.3 % in 2006, in 2005 was 9.5% and 6.2% in 2004. Obviously, Southwest Airlines was able to increase its gross profit margin during the period from 2004 to 2006, and this by itself is a positive signal; however, profit margin declined in 2007. We can see from these ratios that revenue was increasing at a greater rate than unit costs from 2004-2006. However, while these values appear to display a strong company, they need to be compared with figures for the rest of the industry to understand Southwest Airlines position in the market.

Profit Margin Ratio

The profit margin ratio is similar in methodology to the gross profit margin ratio and it represents the net income of the company as a percentage of total revenue. The profit margin takes into consideration all facets of a company's financial structure and standardizes the financial bottom-line of the firm. The profit margin enables million dollar companies to be

compared with billion dollar companies as it shows how much net income is generated for every dollar of revenue. The profit margin formula and Southwest Airlines 2007 profit margin are:

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$$\text{Profit Margin} = \frac{\text{Net Income}}{\text{Total Revenue}} = \frac{NI}{TR}$$

$$\text{Profit Margin} = \frac{\$645 \text{ million}}{\$9,861 \text{ million}} \times 100\% = 6.5\%$$

Based on the audited financial statements of Southwest Airlines, every dollar generates 6.5 cents of profit for the company. Comparatively, 2006's figure was 5.5%, down from 2005's profit margin of 6.4%, but a significant increase over 2004's 3.3% profit margin ratio. Interestingly, this displays a slightly different perspective on the company than the gross profit margin ratio which displayed Southwest Airlines profit trend as continually increasing. This paradox is the result of a significant one-time loss charge posted by Southwest Airlines in 2006.¹ This shows the importance of both calculations when performing ratio analysis, since the airline's gross profit margin declined from 2006 to 2007 while total profit margin increased. If only one or the other of the ratios were calculated, the results could be potentially deceiving when analyzing the company.

Return on Assets (ROA)

Another profitability ratio that can be used to help standardize large and small companies is the return on assets ratio. This ratio measures the net income of the company after taxes against the fixed assets of the company. This shows the investment return that assets have provided. A company invests in fixed assets in an effort to generate increased profits, and therefore the return on assets ratio analyzes a company at the very fundamental elements of business. The formula for the return on assets is:

¹ Refer to the income statement in figure 3 of Chapter 3 which displays a \$150 million other net loss in 2006, compared to a \$90 million other net gain posted in 2005.

$$\text{Return on Assets (ROA)} = \frac{\text{Net Income}}{\text{Total Assets}} = \frac{NI}{TA}$$

with Southwest Airlines 2007 return on assets being:

$$\text{ROA} = \frac{\$645 \text{ million}}{\$16,772 \text{ million}} \times 100\% = 3.85\%$$

Southwest Airlines 2007 return on assets ratio indicates that \$100 spent on assets yielded 3.85 cents of profit for the company. The return on assets ratio varies considerably by industries, since some industries are more highly capital intensive than others. The airline industry is highly capital intensive, therefore the average industry return on assets is likely to be lower than in other industries. Because of this, the best way to compare the return on assets ratio is between companies competing within the same industry, providing a valuable benchmark by which to judge the firm.

Return on Equity (ROE)

Similar in goal and methodology to the return on assets ratio, return on equity measures the company's performance against the total stockholders' equity in the company. The general formula for the return on equity formula and Southwest Airlines 2007 return on equity is once again found by referring back to both the income statement and balance sheet:

$$\text{Return on Equity (ROE)} = \frac{\text{Net Income}}{\text{Total Stockholders' Equity}}$$

$$\text{ROE} = \frac{\$645 \text{ million}}{\$6,941 \text{ million}} \times 100\% = 9.29\%$$

Unlike the return on assets ratio which may vary considerably from industry to industry, the return on equity ratio does not vary as much between industries. However, it may contain a

larger variance between the companies competing within the industry. While this particular ratio is beneficial to investors, distortions may exist due to the financial structure of a company. For example, a company that is more heavily debt financed may have an artificially higher return on equity ratio than a company that is more equity financed. Therefore, there are multiple issues to consider when analyzing companies' return on equity ratios.

Southwest Airlines 2007 return on equity ratio of 9.29% was slightly higher than 2006's return on equity of 7.74% and 2005's return on equity of 7.25%.² This was due to Southwest Airlines equity structure remaining stable while producing a similar level of profits. Ideally, greater investment in the company should yield higher returns on equity since the company is able to take the equity gained and use it in areas where profits can be made. However, in a mature industry such as the airline industry, increased investment is not always possible as there may be very few areas that could generate new profits.

Asset Turnover Ratio

The asset turnover ratio measures total revenue against the total assets of the company. Similar in vain to the return on assets metric, the asset turnover ratio shows how much revenue assets generate for the company. Asset turnover is calculated using the formula and the results for Southwest for 2007 are calculated below:

$$\text{Asset Turnover} = \frac{\text{Total Revenue}}{\text{Total Assets}} = \frac{TR}{TA}$$

$$\text{Asset Turnover} = \frac{\$9,861 \text{ million}}{\$16,772 \text{ million}} = 0.5879$$

An asset turnover ratio of 0.5879 indicates that every \$100 worth of assets generates \$58.79 of revenue. An interesting relationship between three of the profitability ratios is the following:

² Return on Equity (2005) = \$484 million / \$6,675 million = 7.25%

$$\text{Return on Assets} = \text{Profit Margin} * \text{Asset Turnover}$$
$$\text{ROA} = \text{PM} * \text{ATO}$$

Therefore, only two of the three ratios above need be calculated to determine the remaining ratio. It also indicates how each ratio is looking at a similar component of the company, but goes about analyzing the company in a unique way. Understanding how a company's profits are generated from assets is a critical component to understanding the financial ratios and the concept of financial leverage.

Liquidity Ratios

The second set of financial ratios used to analyze a business is liquidity ratios. These ratios analyze a company from a short-term perspective and focus on the company's ability to meet its current obligations. As mentioned in the previous chapter, liquidity refers to the ease and quickness by which assets can be converted into cash; therefore, the ultimate goal of liquidity ratios are the determination of how quickly the company can convert its assets into tangible cash. The nine liquidity ratios that are to be presented are:

- Working capital
- Current ratio
- Acid-test ratio (Quick ratio)
- Accounts receivable turnover ratio
- Days of accounts receivables
- Accounts payable turnover ratio / Days of accounts payables
- Inventory turnover ratio / Days of inventory

Working Capital

Prior to calculating ratios, it is important to understand the concept of working capital, which is essentially the difference between current assets and current liabilities.

$$\text{Net Working Capital} = \text{Current Assets} - \text{Current Liabilities}$$
$$\text{NWC} = \text{CA} - \text{CL}$$

Referring back to previous definitions, current assets are assets which can be easily convertible into cash, while current liabilities are short-term financial obligations. Therefore, working capital is the excess of short-term assets that are available for use and are not tied up by current liabilities. A company always wants working capital so that its short-term obligations are being met; if short-term obligations are not met the company faces a solvency problem.

For Southwest Airlines in 2007, its amount of working capital was -\$395 million³. This could be rather alarming since it might indicate that the airline did not have the necessary amount of current assets to meet their short-term obligations. However, the company can still operate if they are able to defer their liabilities to a later period or increase their current assets.

Current Ratio

One of the classic financial ratios, the current ratio measures the relationship between current assets and current liabilities. The current ratio analyzes the working capital of the company and helps determine if the company can meet its short-term obligations. However, unlike the amount of working capital which will vary considerably based on the company's size, the current ratio provides standardization of working capital, enabling industry comparison. The current ratio provides a proportion of how much of the company's current liabilities are being met by the company's current assets (Ross, Westerfield and Jordan, 2008). The formula for the current ratio is:

³ Working Capital (2006) = Current Assets – Current Liabilities = \$4,443 million - \$4,838 million = -\$395 million

$$\text{Current Ratio} = \frac{\text{Current Assets}}{\text{Current Liabilities}}$$
$$CR = \frac{CA}{CL}$$

Since it was previously determined that the amount of Southwest Airlines 2006 working capital was negative, the current ratio will be less than one, since all the current liabilities are not being met by current assets. In fact, the 2006 current ratio for Southwest Airlines is 0.90.

$$\text{Current Ratio (2006)} = \frac{\$4,443 \text{ million}}{\$4,838 \text{ million}} = 0.92$$

A current ratio of 0.92 indicates that only 92% of Southwest Airlines' current liabilities will be satisfied with current assets, therefore the company will either attempt to defer their liabilities, or acquire short-term financing through a variety of options, such as a business line of credit. As a comparison, Southwest's 2006 current ratio was 0.90⁴, indicating that Southwest was in a similar predicament the previous year.

Acid-Test Ratio (Quick Ratio)

A similar metric to the current ratio is the quick ratio, except that the quick ratio is a stricter measurement of the company's ability to meet its short-term obligations. The reason for this is the fact that not all current assets are used in the calculation. Current assets have a considerable range in their liquidity since some short-term investments can be converted into cash far more quickly than others, so these assets may be better indicators of the company's ability to meet its obligations. Therefore, in order to provide a more realistic view of assets that

⁴ Current Ratio (2006) = \$2,601 million / \$2,887 million = 0.90

can be converted into cash to meet short-term obligations; the acid-test ratio uses quick assets. While the classification of quick assets is ultimately at the discretion of the analyst, common current assets used as quick assets are cash and cash equivalents, marketable securities, and current accounts receivable. Regardless of the classification of quick assets, inventory is almost always removed from the acid-test ratio, as inventories are more likely to be slow moving, indicating that the inventory is less liquid. Using a methodology where quick assets are simply cash, short-term investments, and accounts receivable, Southwest Airlines 2007 quick ratio was:

$$\text{Quick Ratio} = \frac{\text{Quick Assets}}{\text{Current Liabilities}}$$

$$QR = \frac{QA}{CL}$$

$$\text{Quick Ratio (2007)} = \frac{(\$2,213 + \$566 + \$279) \text{ million}}{\$4,838 \text{ million}} = 0.63$$

Where; Quick Assets = Cash and cash equivalents + Short-term investments + Current accounts receivables

A quick ratio of 0.63 indicates that only 63% of Southwest's current liabilities can be quickly satisfied. Since the acid-test ratio is stricter than the current ratio, the quick ratio is always going to be less than the current ratio. Ultimately, the quick ratio provides a stronger analysis of a company's working capital since it removes some uncertainty over the composition of a company's current assets. How much liquidity an airline needs depends on its operating cycle. An airline's operating cycle is the time between the cash is spent for goods and services to the time that investment generates cash.

Accounts Receivables Turnover Ratio

Companies offer goods and services on credit to attract and maintain customers, since we already know that a dollar today is more expensive than a dollar tomorrow. Since most companies offer credit terms, it is important to monitor accounts receivables to make sure that payment is collected in a timely matter. It may be better for a company to offer long credit terms;

however, if it takes the company a long time to collect accounts receivables, the company has been unable to use that money over the time period.

Therefore, the accounts receivable turnover ratio is a measure of how many times accounts receivable are collected during a specified time period. When calculating the accounts receivable turnover ratio, net credit sales is usually used, since only the portion of revenue that is collected on credit should be analyzed. However, since few companies report revenue between cash and credit sales on their publicly available financial reports⁵, total revenue usually has to be used. This can lead to distortion in calculating the accounts receivable turnover ratio. Additionally, distortions can arise when using the accounts receivable balance at a point in time, since the balance could have varied significantly during the time period. However, since the average accounts receivable balance is only known internally, external analysis has to use the stated value on the balance sheet, and note the possible potential of distortions. Because the accounts receivable turnover ratio determines how quickly accounts receivables are turning over; higher values indicate that accounts receivables are moving more quickly than lower values. Southwest Airlines 2007 accounts receivable turnover ratio is:

$$\text{Accounts Receivable Turnover Ratio} = \frac{\text{Net Credit Sales}}{\text{Average Accounts Receivables}}$$
$$\text{Accounts Receivable Turnover Ratio (2007)} = \frac{\$9,861 \text{ million}}{\$260 \text{ million}} = 37.93^{6,7}$$

Days of Accounts Receivables

One of the problems with the accounts receivable turnover ratio is that the metric can be difficult to interpret. Therefore, an associated ratio is the days of accounts receivable, which

⁵ The notes to the financial statements sometimes contain detail on the amount of revenue generated on credit.

⁶ Since net credit sales were unknown for Southwest Airlines, total operating revenue from the income statement is used instead.

⁷ The average accounts receivable balance for Southwest Airlines was the average of accounts receivable balance at December 31, 2006 and December 31, 2007.

converts the accounts receivable turnover ratio into the average time for accounts receivables during the period. In 2006, the days of accounts receivables for Southwest Airlines were:

$$\text{Days of Accounts Receivables} = \frac{\text{Number of Days in Period}}{\text{Accounts Receivable Turnover Ratio}}$$

$$\text{Days of Accounts Receivables (2006)} = \frac{365}{37.93} = 9.62 \text{ days}^8, 9$$

A value for days of accounts receivables of 9.62 indicates that, on average, revenue generated by Southwest Airlines is collected in approximately nine and a half days. For many companies this is an extremely quick collection period; however, since the majority of airlines collect revenue on a fairly immediate basis¹⁰, the industry is expected to have short days of accounts receivables. For 2006, Southwest's days of accounts receivables was 9.68 days, which means that days of accounts receivables did not change significantly from 2006 to 2007.

Accounts Payable Turnover Ratio / Days of Accounts Payable

Nearly identical in methodology to the accounts receivable turnover ratio is the accounts payable turnover ratio, which measures the number of times the accounts payable account turns over. While analyzing accounts payable is not as important, since the goal is to pay as late as possible, it is useful to compare the days of accounts payable with the days of accounts receivable, to help estimate the days of working capital. The formula for the accounts payable turnover ratio and days of accounts payable are:

⁸ Since net credit sales were unknown for Southwest Airlines, total operating revenue from the income statement is used instead.

⁹ The average accounts receivable balance for Southwest Airlines was the average of accounts receivable balance at December 31, 2006 and December 31, 2007.

¹⁰ For example, the majority of passenger travel is booked through the Internet, which collects credit card payment seemingly immediately. However, a lag does occur between when the credit card company dispatches the revenue collected for the flight to the airline, providing a short days of accounts receivable for credit card generated revenue.

$$\text{Accounts Payable Turnover Ratio} = \frac{\text{Period Purchases}}{\text{Average Accounts Payable}}$$

$$\text{Days of Accounts Payable} = \frac{\text{Number of Days in Period}}{\text{Accounts Payable Turnover Ratio}}$$

When referring to Southwest Airlines income statement, it is difficult to determine the purchases made by the company during the period; therefore, total operating expenses, less depreciation, which is a non-cash item, is used as a proxy for annual purchases. Using this methodology, the accounts payable turnover ratio and days of accounts payable for Southwest Airlines in 2007 was:

$$\text{Accounts Payable Turnover Ratio (2007)} = \frac{(\$9,070 - \$555) \text{ million}}{\left(\frac{\$759 + \$643}{2}\right) \text{ million}} = 12.15$$

$$\text{Days of Accounts Payable (2006)} = \frac{365}{12.15} = 30.04 \text{ days}$$

Based on Southwest Airlines 2007 days of accounts payable, it appears the airline operates on a policy of paying their account within thirty days. Of note is the 20.42 day difference between the days of accounts receivable and accounts payable, indicating that the airline, on average, is able to use the revenue generated for nearly an additional 21 days prior to paying for the cost of flying the passenger. The days of working capital is increased by the fact that the majority of passengers book their travel significantly ahead of the departure date, further strengthening the airline's cash flow and providing the airline the opportunity to use the cash during that time period. Ideally, a company wants to maximize the difference between the days of accounts payable and accounts receivable to provide the company with short-term investment opportunities.

Inventory Turnover Ratio / Days of Inventory

The final area of liquidity to analyze is inventory. This is extremely important for manufacturing firms, but is less important in the airline industry, since a passenger seat is not inventoried. However, airline maintenance does contain inventoried parts to support the operation. Since there is a cost associated with warehousing inventory, it is important to make sure inventory is turning over quickly and not sitting idle in warehouses. On the other hand, the airlines want to make sure flights are not cancelled or delayed as a result of a lack of inventory and this creates conflicting goals. The generic inventory turnover ratio and days of inventory calculations are:

$$\text{Inventory Turnover Ratio} = \frac{\text{Cost of Goods Sold}}{\text{Average Inventory}}$$

$$\text{Days of Inventory} = \frac{\text{Number of Days in Period}}{\text{Inventory Turnover Ratio}}$$

Since Southwest Airlines, or any airline, has a true cost of goods sold, the inventory turnover ratio uses the expense categories for which the inventory is required. Making the assumption that all inventory held by the airline are maintenance materials, the maintenance materials and repairs category can be used as a proxy for the cost of goods sold when calculating the inventory turnover ratio for airlines. Using this methodology, the inventory turnover ratio and days of inventory for Southwest Airlines in 2007 was:

$$\text{Inventory Turnover Ratio (2007)} = \frac{\$616 \text{ million}}{\$259 \text{ million}} = 2.38$$

$$\text{Days of Inventory} = \frac{365}{2.38} = 153.36 \text{ days}$$

For many industries, 153 days of inventory sitting idle would be unacceptable; however, in the airline industry this length of time is fairly common. This is largely a result of numerous parts that are required to support the operation and the fact that the usage of the parts is not very high. Additionally, since airlines operate globally, parts must be stocked in multiple cities to insure an on-time operation. This problem is compounded for Southwest Airlines which does not operate hubs and has sizeable operations at multiple airports. This type of operation likely requires increased inventory because of the numerous airports where maintenance problems might occur. Like most of the ratios, the days of inventory needs to be compared solely within the industry to determine how efficient the airline is operating.

Long Term Risk Ratios

While liquidity ratios help analyze a company's financial position in the short-term, long-term risk ratios, or solvency ratios, analyze a company's ability to remain in business over the long-term. Of all the categories of ratios, long-term risk ratios tend to provide the greatest macro-perspective of a company. Because of this, the ratios focus on the underlying capital structure of the company, which ultimately helps determine the company's financial strength for the future. The three major long-term risk ratios are:

- Debt-to-equity ratio
- Debt ratio
- Times interest earned ratio

Debt-to-equity ratio

The classic long-term risk ratio, the debt-to-equity ratio, determines the proportion of the company's capital structure that is composed of equity. It helps determine where the funding for the company exists, and how heavily weighted the company is to either debt financing or equity financing. The debt-to-equity structure of a company can also indicate the variability of future earnings, as more heavily debt financed companies will incur larger swings in profitability as a result of increased interest expenses. Additionally, the resultant financial structure of a company helps determine the cost of capital, an important metric used in financial decision-making. While numerous derivations of the debt-to-equity ratio exist, the generic formula is:

$$\text{Debt-to-Equity Ratio (D/E)} = \frac{\text{Total Liabilities}}{\text{Total Stockholders' Equity}}$$

Using the generic debt-to-equity ratio and the data from Southwest Airlines balance sheet, its 2007 debt-to equity ratio was 1.42.¹¹ This means that for every \$1 of stockholders' equity, Southwest Airlines has been able to leverage \$1.42 of debt finance. This ratio also indicates that Southwest Airlines is slightly more debt financed than equity funded, as evidenced by a debt-to-equity ratio greater than one. Like so many other ratios, every industry and company are unique, therefore there is no universal optimal debt-to-equity ratio. Comparisons with similar companies competing in the same or similar industries help determine the potential for variability of future earnings.

Debt Ratio

A common derivation of the debt-to-equity ratio is the debt ratio, which simply measures the proportion of debt that is financing the assets of the company. Since either liabilities/debt or stockholders' equity is used to finance assets, the debt ratio ultimately provides the percentage of debt in the capital structure. The debt ratio's formula and Southwest Airlines 2007 debt ratio is:

¹³ Debt-to-Equity Ratio (2007) = \$9,831 million / \$6,941 million = 1.42

$$\text{Debt Ratio} = \frac{\text{Total Liabilities}}{\text{Total Assets}}$$

$$\text{Debt Ratio (2007)} = \frac{\$9,831 \text{ million}}{\$16,772 \text{ million}} = 0.59 \text{ or } 58.62\%$$

Since both sides of the balance sheet must be equal, the debt ratio is merely comparing the proportion of liabilities held by the company against stockholders' equity - essentially the debt-to-equity ratio. Southwest Airlines debt ratio of 58.62% indicates that a little over half of the company's assets were funded by debt. As a comparison, Southwest Airlines 2006 debt ratio was 52.08%;¹² the debt ratio increased slightly for Southwest Airlines in 2007. The comparison of debt ratios over time is an effective tool in helping understand the company's past and how it is positioning itself for the future. Based on a stable debt ratio, the airline appears satisfied with its mix of debt and equity in its capital portfolio, indicating a rather stable financial environment for the company. If a company were to make radical changes in its capital structure, such as dramatically increasing its proportion of equity, some financial implications could be drawn. These might include the fact that the cost of debt for the company may be prohibitively high (likely the result of poor bond ratings), or the company may be wishing to raise capital without having any set payment schedules. Therefore, changes in capital structure, help to determine the company's ability to stay in business for the long-term.

Times Interest Earned Ratio

The times interest earned ratio measures the company's ability to meet its interest payments. To debt holders, the times interest earned ratio is critical in determining the amount of risk the company presents to them. While calculated multiple ways, a simple method in calculating the times interest earned ratio is:

¹² Debt Ratio (2006) = Total Liabilities / Total Assets = \$7,011 million / \$13,460 million = 52.08%

$$\text{Times Interest Earned Ratio} = \frac{\text{Earnings Before Interest and Taxes (EBIT)}}{\text{Interest Expense}}$$

Using information from the income statement, the times interest earned ratio for Southwest Airlines was 6.64 in 2007.¹³ This value indicates that in 2006, Southwest Airlines operating income was nearly seven times the annual interest expense, showing that they were in a fairly good position to be able to meet their interest payments. Therefore, the higher the times interest earned ratio, the better able the company is to meet their interest requirements. Having a higher times interest earned ratio ultimately helps lower the cost of debt as the company appears more stable to creditors. For comparison purposes, the times interest earned ratio in 2006 and 2005 was 7.30 and 5.94 respectively for Southwest Airlines.¹⁴ Based on these values, Southwest Airlines has moved itself into a better position to meet their interest payments since 2005, displaying a strengthening financial position over the three years.

Stock Market Ratios

The final set of ratios that can be used to analyze a company are stock market ratios; these ratios analyze a company in relationship to its equity position. Because stock market ratios analyze a company's position in the stock market, the ratios can only be used for public companies. The ratios provide good information when an individual is considering investing in a company, and are used extensively by the investment banking community in determining a company's value. Since ultimately a company's stock price is the result of analysis and projections by investors, stock market ratios are important in determining the fiscal health of a company. Since the goal of investing is to purchase low and have the company perform well in the future, stock market ratios help analyze the current value of a company. Listed below are

¹³ Times interest earned ratio (2007) = \$791 million / \$119 million = 6.64

¹⁴ Times interest earned ratio (2006) = \$934 million / \$128 million = 7.30
Times interest earned ratio (2005) = \$725 million / \$122 million = 5.94

four common stock market ratios that are commonly used when assessing a company's position in the stock market:

- Earnings per share
- Price-earnings ratio
- Dividend payout ratio
- Dividend yield ratio

Earnings per share

Since earnings per share were covered in the previous chapter, extensive explanation of the ratio is not required. As a refresher, earnings per share essentially state the net income of the company on a per share basis, reflecting the amount of income earned for every outstanding share of the company in the market. The simple formula for earnings per share is:

$$\text{Earnings per Share (EPS)} = \frac{\text{Net Income}}{\text{Average Number of Shares Outstanding}}$$

Earnings per share helps standardize a company's earnings based on their amount of equity. In financial circles, net income is always stated on an earnings per share basis, as it ultimately reflects the net income earned for every individual shareholder. Most publicly available income statements provide earnings per share and Southwest Airlines EPS for the period ending December 31, 2007 was \$0.85 (Southwest Airlines, 2008, February 1).

Price-earnings ratio

The price-earnings ratio is the ultimate assessment of a company's stock market value as it compares the relationship between the performance of the company according to the income statement and the stock market. Based upon the comparison of earnings and the stock price, the price-earnings ratio helps enable one to determine if the stock price of a company is either undervalued or overvalued. The P/E ratio is a measure every investor should be aware of to help find good stock market values. The price-earnings ratio is calculated using the following formula:

$$\text{Price-Earnings Ratio} = \frac{\text{Current Market Price}}{\text{Earnings per Share}} = \frac{P_s}{EPS}$$

Since the price-earnings ratio is calculated using the current stock market price of the company, the price-earnings ratio will be in constant flux based on the daily stock price. Based on Southwest Airlines earnings per share of \$0.85, and its stock price of \$12.20 on December 31, 2007, the price-earnings ratio of Southwest on December 31, 2007 was:

$$\text{Price-Earnings Ratio (2006)} = \frac{\$12.20}{\$0.85} = 14.35$$

A price-earnings ratio of 14.35 indicates that the stock price is 14.35 times greater than the earnings of the company. Like many other financial ratios, there is no target value for what the price-earnings ratio should be. The optimum price-earnings ratio is based on not only the industry the firm competes in, but also the overall stock market. A high price-earnings ratio may indicate that the stock price of the company is overvalued while the stock is likely undervalued for low price-earnings ratios. However, determining if a price-earnings ratio is high or low is ultimately a decision that the individual investor has to make, with the metric merely providing the investor with a methodology of helping assess the value of a company's stock.

The price-earnings ratio computed for Southwest Airlines on December 31, 2007 was backward looking since it used the historical financial performance of the company. The price-earnings ratio can also be forward looking by using projected earnings per share based upon a projection of future earnings. Forward looking P/E ratios help signal if the current stock price is either under- or overvalued for the company's future prospects. Obviously, this methodology is only as good as the accuracy in determining earnings per share for a company for a future period, and these estimates can be influenced by a variety of factors.

Dividend payout ratio

An investor can earn a return on investment through two means: capital gains associated with selling a stock at a higher price than the price at which it was purchased and through the receipt of dividends issued by the company. The specific dividend policy of a company is usually complex, incorporating a host of factors; however at a more general level, companies issue dividends (either cash payments or additional stock issues) in an effort to attract equity. Ultimately, the amount of dividends issued is reflected in the share price, with the assumption being that all information is disseminated.

The dividend payout ratio measures the percentage of earnings paid out as dividends. It reflects the level of dividends that the company is distributing. A company with a high dividend payout ratio is attempting to signal that it is well off financially or that the company does not have the need to re-invest the earnings for other activities. Conversely, a low dividend payout ratio signals that a company is strapped for cash or wishes to re-invest the earnings in an attempt to realize even greater earnings in future periods. The dividend payout ratio is calculated with the formula:

$$\text{Dividend Payout Ratio} = \frac{\text{Dividends Distributed per Share}}{\text{Earnings per Share}}$$

Using Southwest Airlines \$0.85 earnings per share in 2007 and cash dividends of \$0.018 per share issued during the year, the dividend payout ratio for Southwest Airlines would be:

$$\text{Dividend Payout Ratio (2006)} = \frac{\$0.018}{\$0.85} = 0.0212 \text{ or } 2.12\%$$

A dividend payout ratio of 2.12% shows that Southwest Airlines decided to distribute 2.12% of its earnings during the period back to its shareholders. Once again, there is no optimum dividend payout ratio, and equally successful companies can have wildly divergent dividend

payout ratios; however, the ratio does enable an investor to understand the dividend policy of the company, and this helps an investor determine an expected value for the stock.

Final Draft

Dividend yield ratio

The dividend yield ratio measures the relationship between dividends distributed and the market price of the company. The dividend yield ratio provides a similar level of analysis as the dividend payout ratio and is important to investors, particularly shareholders' dependent on dividends as a return on their investment. The dividend yield ratio is calculated using the following formula:

$$\text{Dividend Yield Ratio} = \frac{\text{Dividends Distributed per Share}}{\text{Current Market Price}}$$

Using the cash dividend of \$0.018 per share being distributed during 2007 and a market price for Southwest Airlines stock at \$12.20, the dividend yield ratio is 0.15%.¹⁵ This indicates that less than 1% of Southwest Airlines stock price has dividends that are being distributed, and this in turn means that the stock has a low yield in terms of dividends. Since there are other ways a stock can yield a return on investment (for example, capital gains), this ratio alone should not distract investors; however, investors seeking dividends should probably focus their attention elsewhere. By and large, the airline industry has very low dividend yield and payout ratios. This is due in part to the volatility of the industry and the need to invest in extensive capital projects. However, a few sectors, such as utility companies, are renowned for strong dividend yields, representing a relatively safe investment opportunity for risk-adverse investors who wish to earn returns from dividends. Further discussion of dividend policy is contained later in the text.

Financial Ratios: Airline Specific Ratios

Since every industry is unique, certain specific ratios are developed that help provide a greater depth of analysis and understanding of the industry. The airline industry ratios are centered on two major measures of an airline's output: available seat miles (ASM) and revenue

¹⁵ Dividend Yield Ratio (2007) = \$0.018 / \$12.20 = 0.15%

passenger miles (RPM). These two measures, combined with various items on the income statement and balance sheet, provide a substantial amount of airline-specific financial ratios.

Available seat miles is a measure of an airline's output, since it represents the number of miles that the airline has flown with its available seats, regardless of whether the seat is filled by a passenger. To illustrate, a 200 seat aircraft flying a 1,000 mile flight would represent 20,000 ASM.¹⁶ Available seat miles provides some standardization to an airline's output; however, ASM does not provide a complete standardization since airline's can have the same amount of ASM, but operate completely differently. For example, a short-haul airline with multiple frequent flights could end up with a similar amount of ASM as a long-haul international airline with less frequent flights, yet the two airlines have completely different operating structures. By altering aircraft frequency of flight and flight distance, airlines can adjust their output either upward or downward.

Revenue passenger miles represent the number of miles that revenue passengers fly on the airline. Whereas ASM does not differentiate between whether the seat is occupied or not, RPM are only calculated seats occupied by passengers. To further illustrate, the revenue passenger miles for the 200 seat aircraft flying the 1,000 mile flight with 140 revenue passengers would be 14,000 RPM.¹⁷ As a result, RPM provides standardization for revenue while also allowing for easy calculation of an airline's load factor. Load factor is simply the proportion of an airline's seats that are filled by revenue passengers, and can be calculated by dividing RPM by ASM.

$$\text{Load Factor} = \frac{\text{RPM}}{\text{ASM}}$$

As an example, consider Southwest Airlines 2007 operating statistics:

¹⁶ ASMs = Number of Seats per Aircraft * Flight Distance = 200 seats * 1,000 miles = 20,000 ASM

¹⁷ RPMs = Number of Revenue Passengers * Flight Distance = 140pax * 1,000 miles = 14,000 RPM

Table 4.1	Southwest Airlines 2007 Operating Statistics						
	<table border="1"> <tr> <td>Available seat miles (millions)</td> <td>99,636</td> </tr> <tr> <td>Revenue passenger miles (millions)</td> <td>72,319</td> </tr> <tr> <td>Average load factor</td> <td>72.58%</td> </tr> </table>	Available seat miles (millions)	99,636	Revenue passenger miles (millions)	72,319	Average load factor	72.58%
Available seat miles (millions)	99,636						
Revenue passenger miles (millions)	72,319						
Average load factor	72.58%						
Source: Compiled by the authors from Southwest Airlines 2007 annual report							

In the above example, Southwest Airlines 2007 load factor was 72.58%. While load factor provides an understanding of the airline's operation, it is not useful in determining the profitability of an airline since it omits the two critical factors in determining profitability: revenue and cost. Load factor merely highlights if seats are full, but high load factors alone do not indicate profitability. For example, an airline could achieve a 100% load factor if it sold every seat for one dollar; however, the flight would not be profitable as the costs would far exceed the revenue. Two important airline-specific metrics that standardize revenue and costs are respectively RASM (Revenue per Available Seat Mile) and CASM (Cost per Available Seat Mile),

RASM (Revenue per Available Seat Mile) standardizes revenue by calculating the amount of revenue that an airline receives for one available seat mile. It is calculated by taking the total passenger revenue generated and dividing by total ASM. For Southwest Airlines, its RASM is calculated below and was 9.49 cents for 2007.

$$\text{RASM} = \frac{\text{Total Passenger Revenue}}{\text{Total ASM}}$$

$$\text{RASM (2006)} = \frac{\$9,457 \text{ million}}{99,636 \text{ million}} = 9.49 \text{ cents}$$

This implies that for every seat mile that Southwest Airlines flies, it generates 9.49 cents of revenue for that seat. Therefore, this ratio provides standardization for all airlines since their revenue generation is based on their level of output.

A similar metric is CASM (Cost per Available Seat Mile), which standardizes the costs of operating the airline, by providing the cost for one available seat mile. CASM is frequently calculated using both total expenses and just operating expenses. Additionally, CASM for individual line items can be calculated. For example, the maintenance, materials, and repairs CASM can be calculated and this enables a comparison of airline's maintenance operations with other airlines. Regardless of which cost item is being compared, CASM simply provides the cost on a seat mile basis.

$$\text{CASM} = \frac{\text{Total Costs}}{\text{Total ASM}}$$

$$\text{CASM - Total (2006)} = \frac{\$9,216 \text{ million}}{99,636 \text{ million}} = 9.25 \text{ cents}$$

$$\text{CASM - Operating (2006)} = \frac{\$9,070 \text{ million}}{99,636 \text{ million}} = 9.10 \text{ cents}$$

For Southwest Airlines in 2007, its total CASM was 9.25 cents. This included all their operating expenses, other expenses (such as interest and gains/losses), and income taxes. Since items such as interest expenses and income taxes do not directly relate to the operation of the airline, and ultimately the company's output, a more accurate measure of an airline's cost structure is its operating CASM, which includes just operating expenses. For 2007, Southwest Airlines operating CASM was 9.10 cents.

As described earlier, profit/net income is simply the resultant of total revenue less total costs. Since both revenue and expenses are standardized by the same metric (ASM), profit can

also be stated in terms of available seat miles. Southwest Airlines total profit in 2007, stated in terms of available seat miles was:

$$\text{Total Profit per ASM} = \text{RASM} - \text{CASM}$$

$$\text{Total Profit per ASM (2006)} = 9.49 \text{ cents} - 9.25 \text{ cents} = 0.24 \text{ cents}^{18}$$

Southwest Airlines earned a profit of 0.24 cents for every seat mile that is flown. Therefore, a 137-seat aircraft flying a 500-mile route in 2007, earned Southwest Airlines, on average, a profit of \$164.40.¹⁹ Obviously, if Southwest Airlines CASM was greater than their RASM, the calculation would be the airline's loss per ASM.

A common misconception made about RASM is that it equals the average fare paid by a passenger for one mile. However, since RASM can be adjusted by either obtaining more revenue from the same number of passengers or by increasing the total number of passengers, it does not accurately reflect the revenue generated for just the paid seats. Thus, RASM reflects the revenue generated for both paid and unpaid seats. Therefore, in order to determine the average amount of revenue received for a paid seat, RRPM (Revenue per Revenue Passenger Mile) or yield is calculated.

$$\text{RRPM} = \frac{\text{Total Passenger Revenue}}{\text{Total RPM}}$$

$$\text{RRPM (2006)} = \frac{\$9,457 \text{ million}}{72,319 \text{ million}} = 13.08 \text{ cents}$$

¹⁸ It should be noted that the calculation does not exactly represent Southwest Airlines total profit as RASM excludes freight and other revenue. Freight revenue is rarely stated in terms of ASM, but instead have its own metric stated in terms of ATM (Available Ton Miles). An ATM is simply one available freight ton transported for one mile. As a result, RATM (Revenue per Available Ton Mile) and CATM (Cost per Available Ton Mile) can also be calculated. These metrics are obviously more important for all-cargo airlines.

¹⁹ Total Profit = Aircraft Size * Stage Length * Profit per ASM = 137*500*\$0.0024 = \$164.40

In 2007, Southwest Airlines on average was able to generate 13.08 cents of revenue from a paid passenger for one seat mile. Therefore, the average revenue received for a 500 mile flight on Southwest Airlines in 2006 was just \$65.40. It is important to note that the average fare paid by the consumer was likely much higher as a result of taxes and fees. Yield is an important airline metric since it ultimately measures the airline's ability to maximize revenue. This is accomplished through effective yield management and by providing a product that consumers want and are willing to pay for.

As mentioned earlier, when calculating airline passenger load factor, the value is generally irrelevant unless compared to the breakeven load factor. Breakeven load factor is defined as the average percentage of an airline's capacity that must be covered for the airline to make zero profit. As a result, breakeven load factor takes into consideration the costs required to provide the product. Based on breakeven load factor, any actual load factor greater than the break even would provide a positive contribution, while any load factor less than breakeven would represent a loss. The basic formula for breakeven load factor is:

$$\text{B/E Load Factor} = \frac{\text{CASM}}{\text{RRPM}}$$

$$\text{B/E Load Factor (2006)} = \frac{9.25 \text{ cents}}{13.08 \text{ cents}} = 70.72\%$$

Based on calculations of Southwest Airlines' actual load factor (72.58%) and breakeven load factor (70.72%), the airline made a profit in 2007. Breakeven load factor can also be calculated using direct operating CASM, with any actual load factor greater than breakeven representing a positive contribution margin; however, it may not necessarily represent a profit since fixed overhead costs would still need to be met. Therefore breakeven load factor is usually one of the more important factors employed by an airline when assessing routes and flights on an individual basis.

Airline Industry Benchmarking

As mentioned earlier, calculating various financial ratios is merely an academic exercise unless they are compared to other firms competing in the same industry. Therefore, the remainder of this chapter is devoted to using the financial ratios discussed above to benchmark (compare) twelve US airlines to highlight their comparative effectiveness with respect to the financial ratios. The twelve US airlines represent a mixture of low-cost and legacy carriers, providing an interesting contrast between the business models for the respective categories. Since it is mandatory that all US airlines provide financial and operating statistics to the Department of Transportation (DOT), all the data are readily available from the Bureau of Transportation Statistics (BTS), simplifying the process for performing industry benchmarking²⁰.

Profitability Analysis

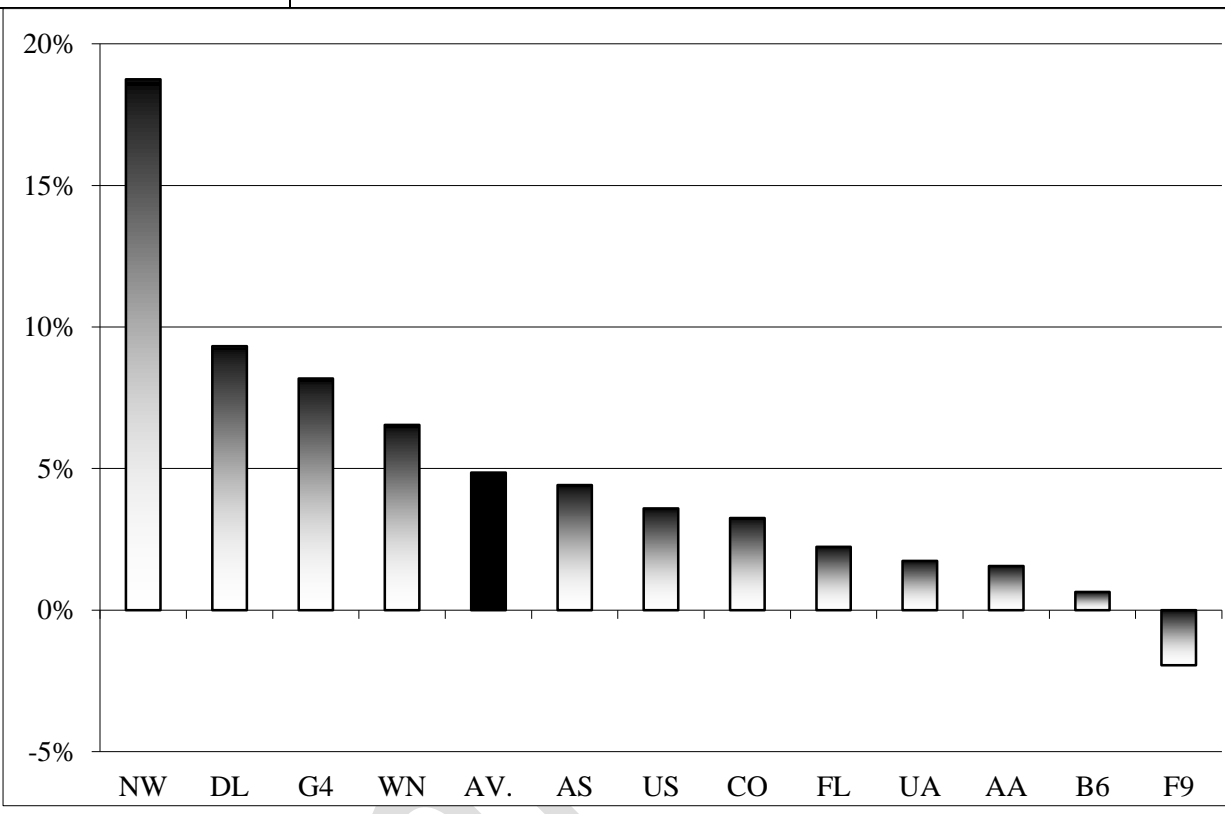
Figure 4.1 provides the profit margin for twelve United States airlines for 2007.²¹ Profit margin helps determine the carrier's ability to turn revenue into profit. Based on the data for 2007, all US airlines were profitable except for Frontier Airlines (F9). Of all the carriers, it appears that Northwest Airlines (NW) was the most successful; posting a profit margin that was nearly double the next best carrier, Delta (DL). However, since data represent only one year, they could be distorted due to special charges or one-time gains. Based on historical experience, profit margins in excess of 10% are rare for the airline industry; therefore, it is likely that Northwest's statistics are distorted by some other factors.

²⁰ It should be noted that the data obtained through the DOT and BTS is not perfect, as errors can exist in the data and carriers do not always group into similar categories.

²¹ For a reference of the IATA two-letter carrier designation codes, refer to Appendix 1.

Figure 4.1

US Airlines' 2007 Profit Margin



Source: Compiled by the authors from Bureau of Transportation Statistics (BTS) data

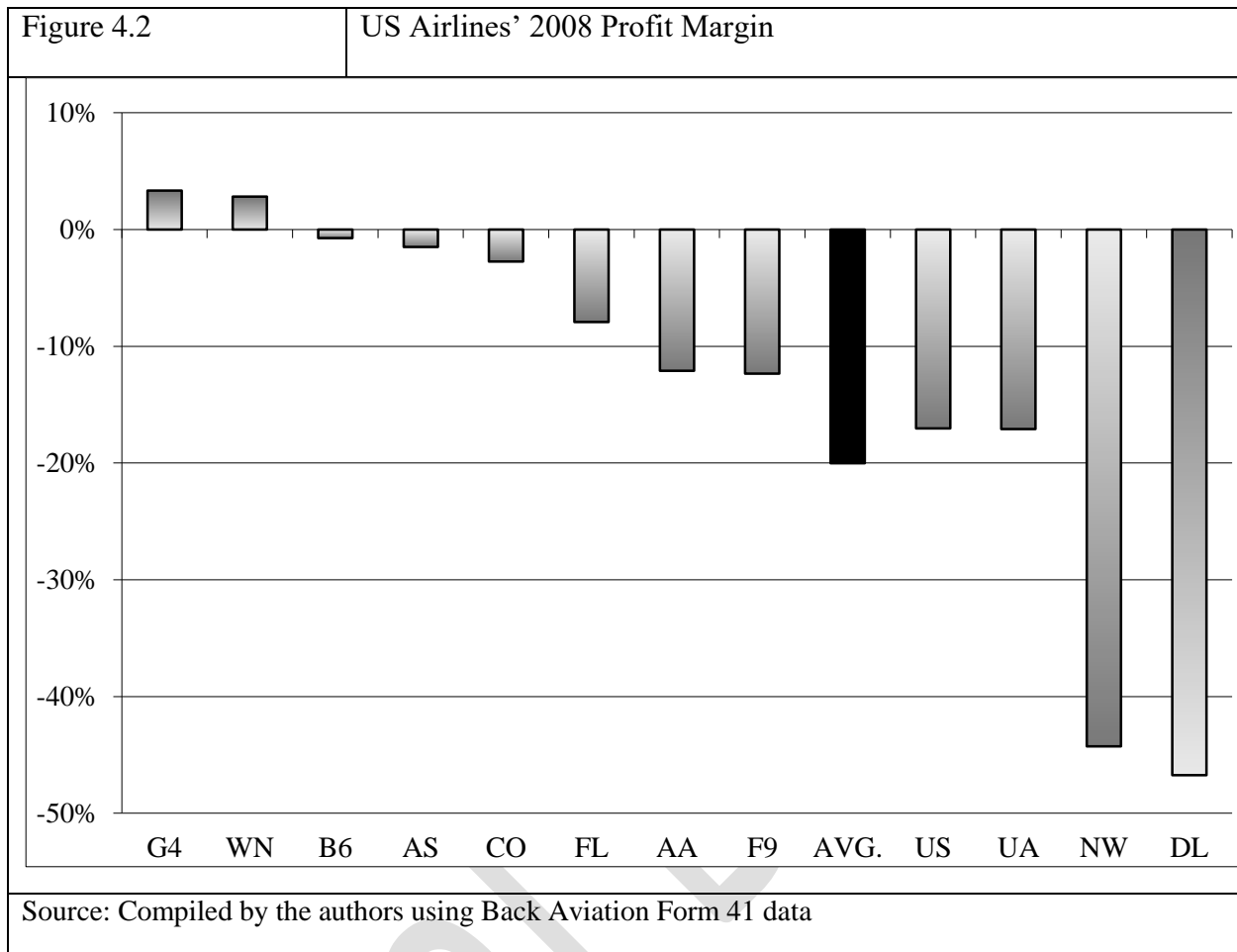


Figure 4.2 shows that while most major U.S. carriers were profitable in 2007; almost all of the carriers were not in 2008. Only Allegiant Air (G4) and Southwest Airlines (WN) were profitable in 2008, with the average profit margin being approximately -20%. The reasons for the large negative profit margins include spiking fuel prices during the middle of 2008, reduced demand at the end of 2008 and in the case of Northwest and Delta, one-time costs associated with the merger.

As mentioned previously, a more accurate assessment of an airline's operations during the period is the operating profit margin ratio, which helps remove distortions in the data. Using the operating profit margin ratio, figure 4.3 shows that Northwest Airlines (NW) dominance in 2007 over the industry was much less than if one had only examined the total profit margin. Northwest's gross profit margin was on par with Allegiant Air (G4) and Southwest Airlines (WN), with all three carriers around 8%. These three airlines present three divergent airline

business models, with Northwest Airlines as a legacy international carrier, Allegiant as a leisure, quasi-charter airline, and Southwest Airlines as a national low-cost carrier. All three airlines found a way to turn roughly 8% of their revenue into an operating profit, highlighting their ability to maintaining a spread between unit revenues and unit costs in 2007.

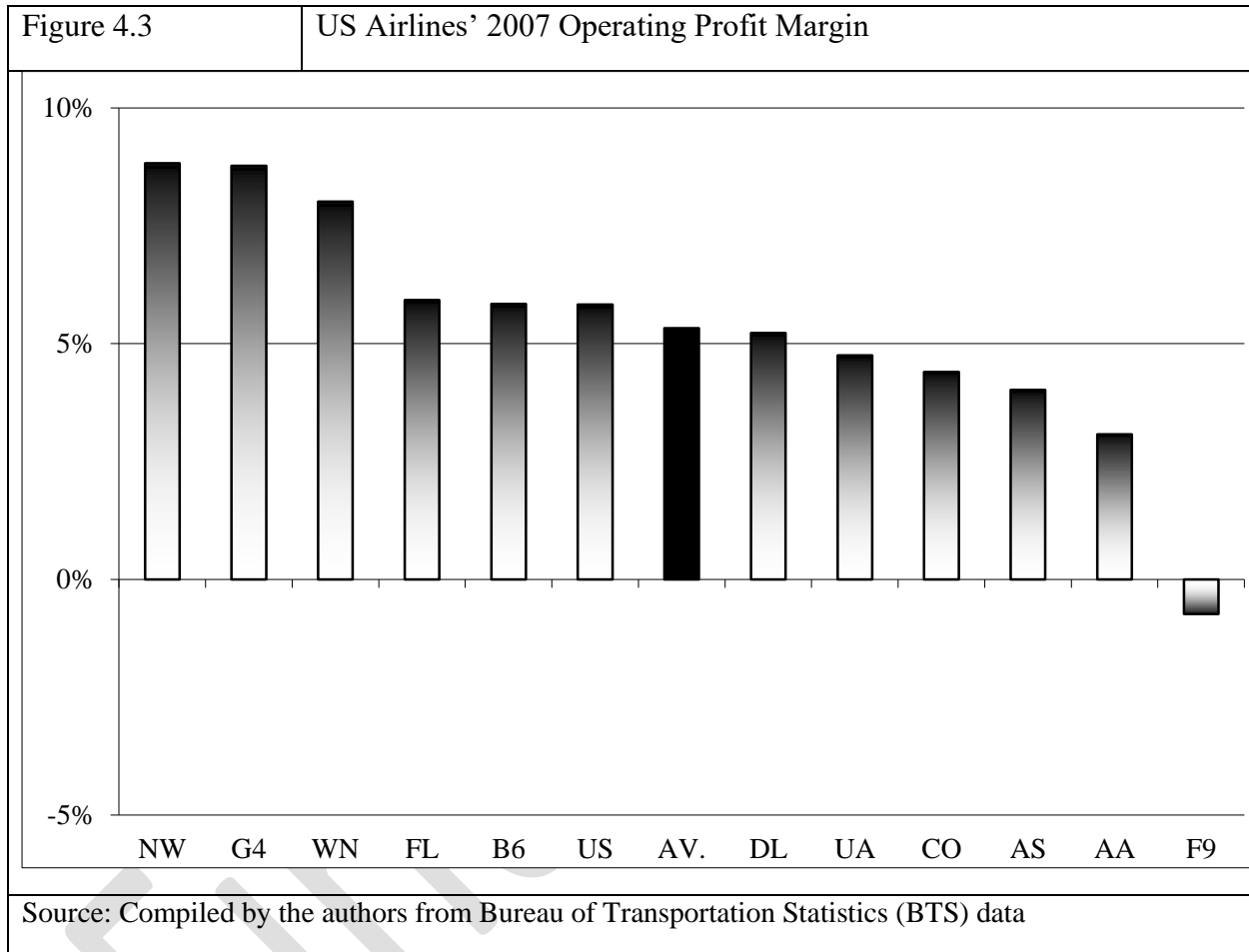
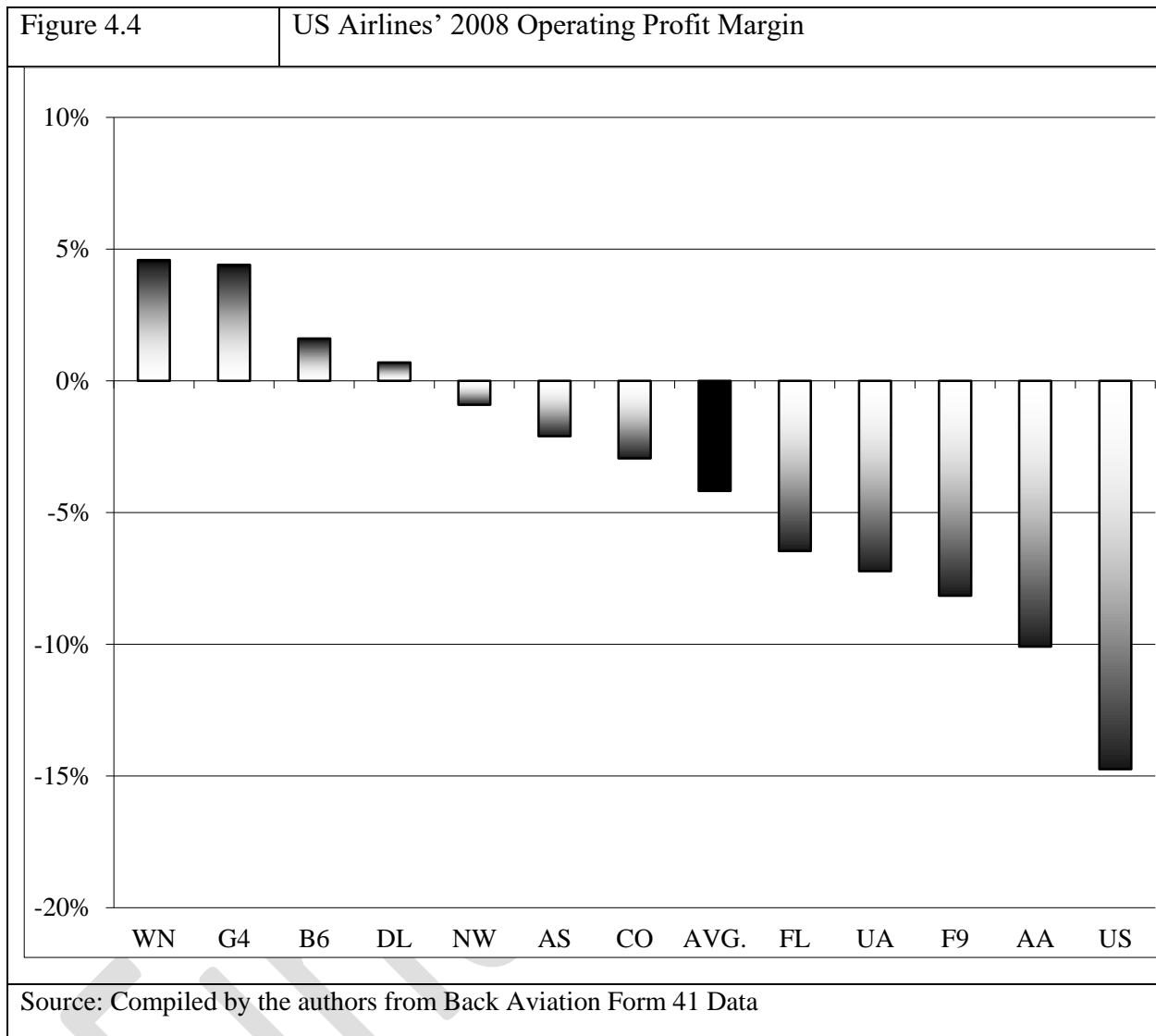
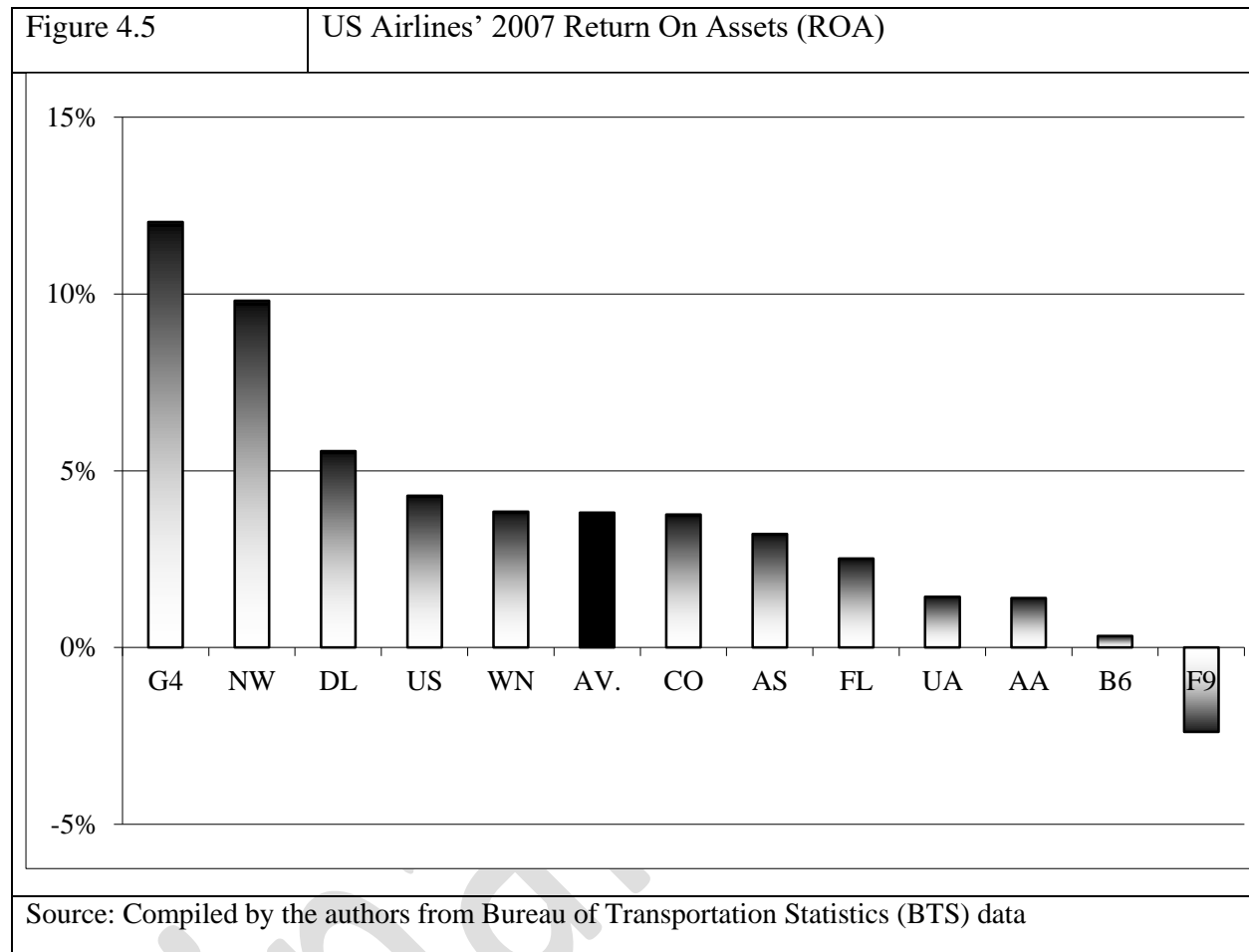


Figure 4.4 highlights the change between operating profit margins in 2008 and 2007. As with the total profit margin, the 2008 operating profit margins were much lower than they were in 2007; only four major U.S. airlines were able to make an operating profit in 2008; Southwest, Allegiant, JetBlue and Delta. The average operating profit margin for all carriers in the figure was about -4%.



Other methods for analyzing profitability are return on assets and return on equity. These metrics can be particularly important when deciding to invest in an airline, either through the purchase of equity or through capital leases. Figure 4.5 provides the 2007 return on assets for the twelve US airlines that are being compared. Here both Allegiant Airlines (G4) and Northwest Airlines (NW) had very good return on asset ratios. Their success could largely be attributed to the airlines having outright ownership of aircraft that are aging and are close to being fully depreciated. Since aircraft represent the largest asset pool for airlines, an airline that is able to generate decent returns with cheaper aircraft will generally have good ROA ratios. At the other

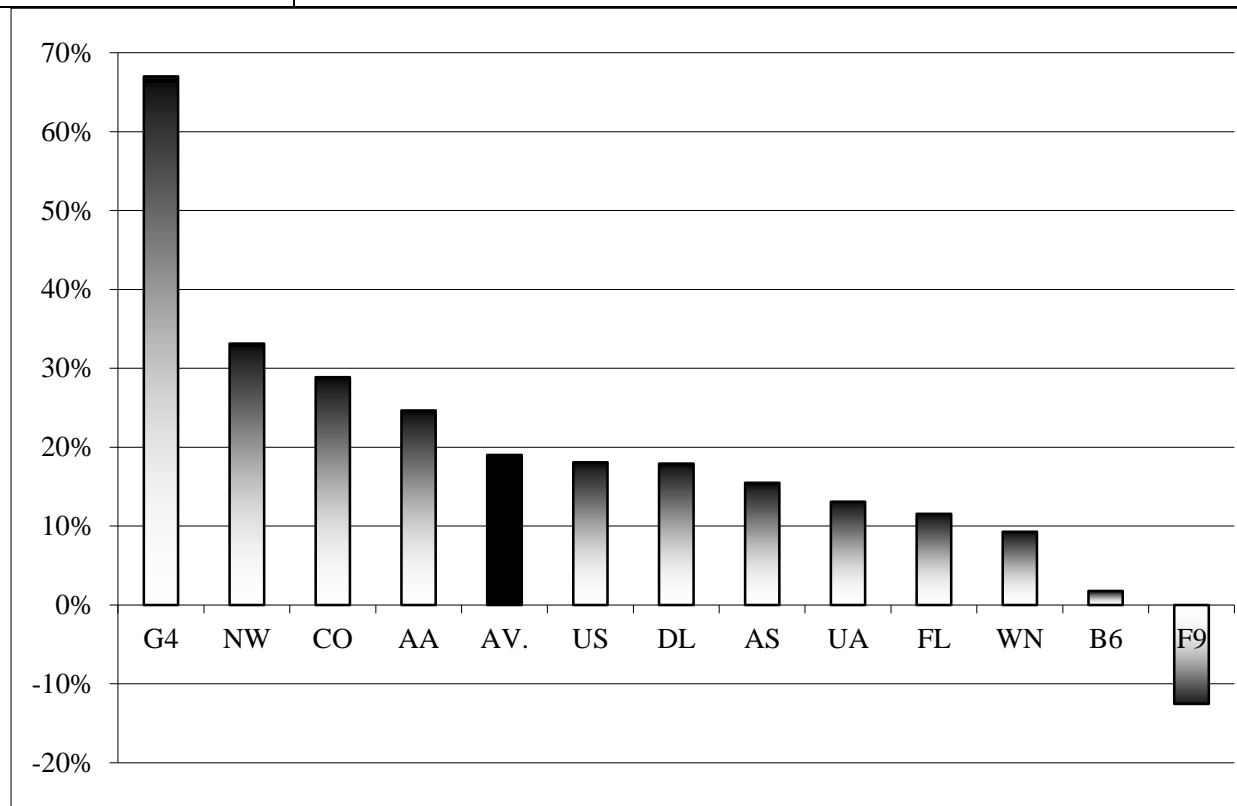
end of the spectrum, both JetBlue (B6) and Frontier (F9) have newer aircraft fleets, but were unsuccessful in 2007 in parlaying these new aircraft into increased profitability.



From a shareholders' perspective, an airline's ability to convert equity into profitability is one of the clear signals for the success of the company. Figure 4.6 shows that Allegiant Airlines (G4) had a tremendously high return on equity in 2007, while the rest of the industry also had solid ROE values. Clearly, equity investments in Allegiant Airlines translated into strong financial success in 2007. It is also worth noting that the grouping of carriers based on return on equity is similar to the return on asset ratios presented in figure 4.5, with Allegiant and Northwest Airlines (NW) at the top and JetBlue (B6) and Frontier Airlines (F9) near the bottom.

Figure 4.6

US Airlines' 2007 Return On Equity (ROE)



Source: Compiled by the authors from Bureau of Transportation Statistics (BTS) data

Based on the four profitability metrics, a more in depth picture of the financial success of US airlines is possible. This is particularly true when applied to Allegiant Airlines (G4), a small airline whose total profits only totaled \$27 million, but whose financial performance was outstanding. This is a major benefit of benchmarking since it allows both small and large airlines, all with different operating philosophies, to be compared. Northwest Airlines (NW) displayed some strong financial results; this could be the culmination of financial restructuring and/or improved operational performance. Southwest Airlines (WN) maintained steady financial results, proving yet again why it is continually regarded as one of the best managed US airlines. As a whole, the US airlines displayed solid financial results in 2007, particularly when compared to the disastrous financial performance of many previous years. However, 2008 saw a return to unprofitability for most carriers as a combination of high fuel prices and reduced demand reduced profit margins. While analyzing profitability helps one understand the historical performance of the airlines, more analysis is required to help predict future performance.

Liquidity Analysis

As mentioned previously, the goal of liquidity ratios is to analyze the short-term solvency of an airline, in an effort to help determine if the airline can meet its short-term financial commitments. In an industry with such tremendous volatility, efficient cash management is critical to short-term success.

A key measurement of liquidity is the current ratio which compares the current assets of the company to their current liabilities. Ideally, an airline wants a current ratio greater than 1, indicating that its short-term liabilities can be covered by its current assets. For the twelve airlines sampled in figure 4.7, only Northwest Airlines (NW) and Alaska Airlines (AS) had current ratios in excess of 1 in 2007. This indicates that for the other ten airlines, if all their current liabilities were to come due at once, they would not be covered. As it is, these airlines will have to take measures in the short-term to help satisfy their current liabilities. While the majority of the airlines have a current ratio in the 0.75 to 0.95 range, Allegiant Airlines (G4) has a current ratio of 0.39, which is very low. However, Allegiant's profitability ratios were above average for the industry, indicating that the airline may hope that future profits will generate cash, which in turn should help cover current liabilities. Regardless, Allegiant Airlines may need to do some restructuring of their current liabilities and assets to satisfy short-term requirements.

While the current ratio and the quick ratio help analyze the overall immediate solvency of a company, three separate liquidity ratios analyze the financial structure of the airlines from an operational standpoint; these assess how effective the airlines are at cash management. Days of accounts receivables, days of accounts payable, and days of inventory are all metrics that analyze a different portion of an airline's cash management. When combined, they display the airline's overall cash management efficiency.

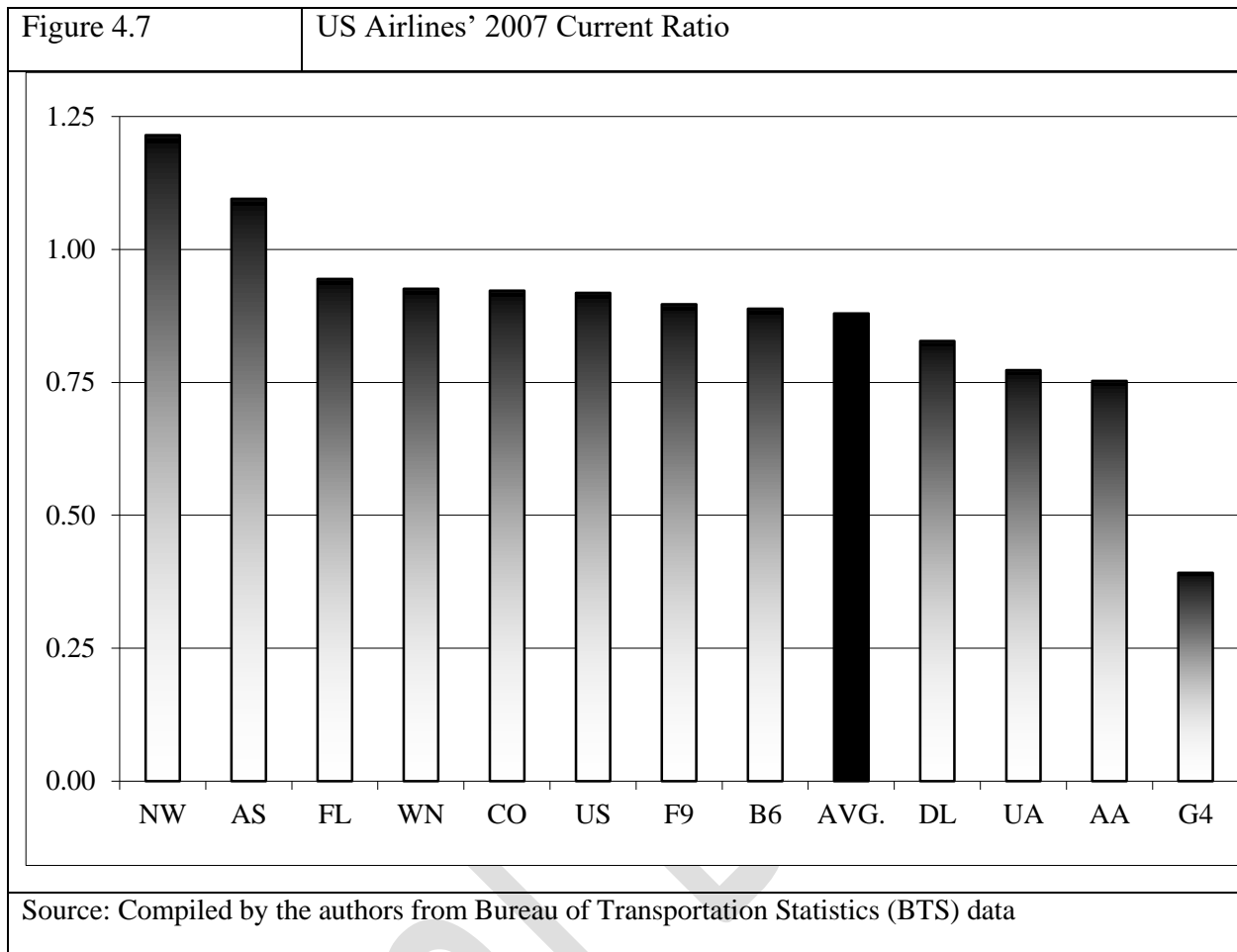
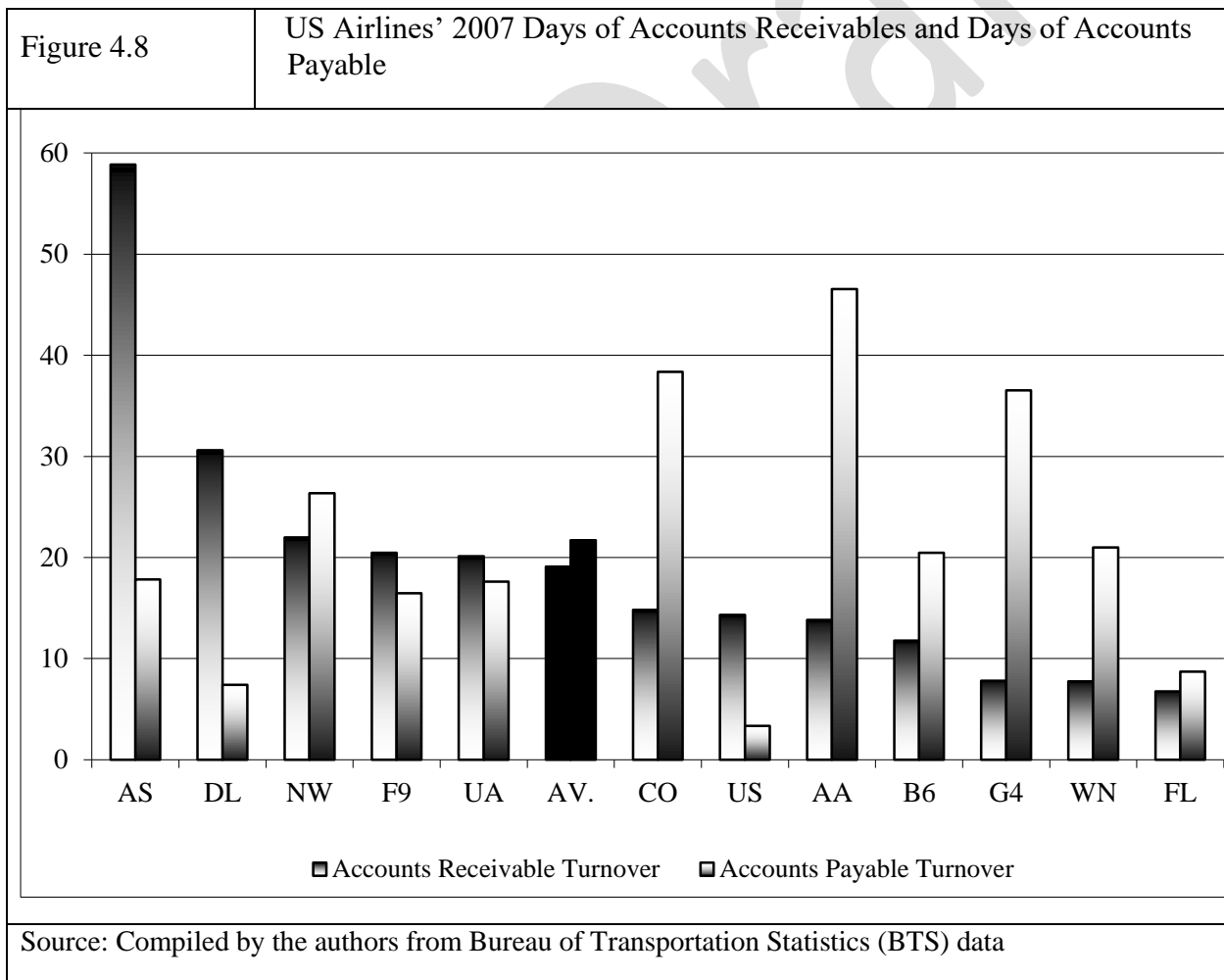


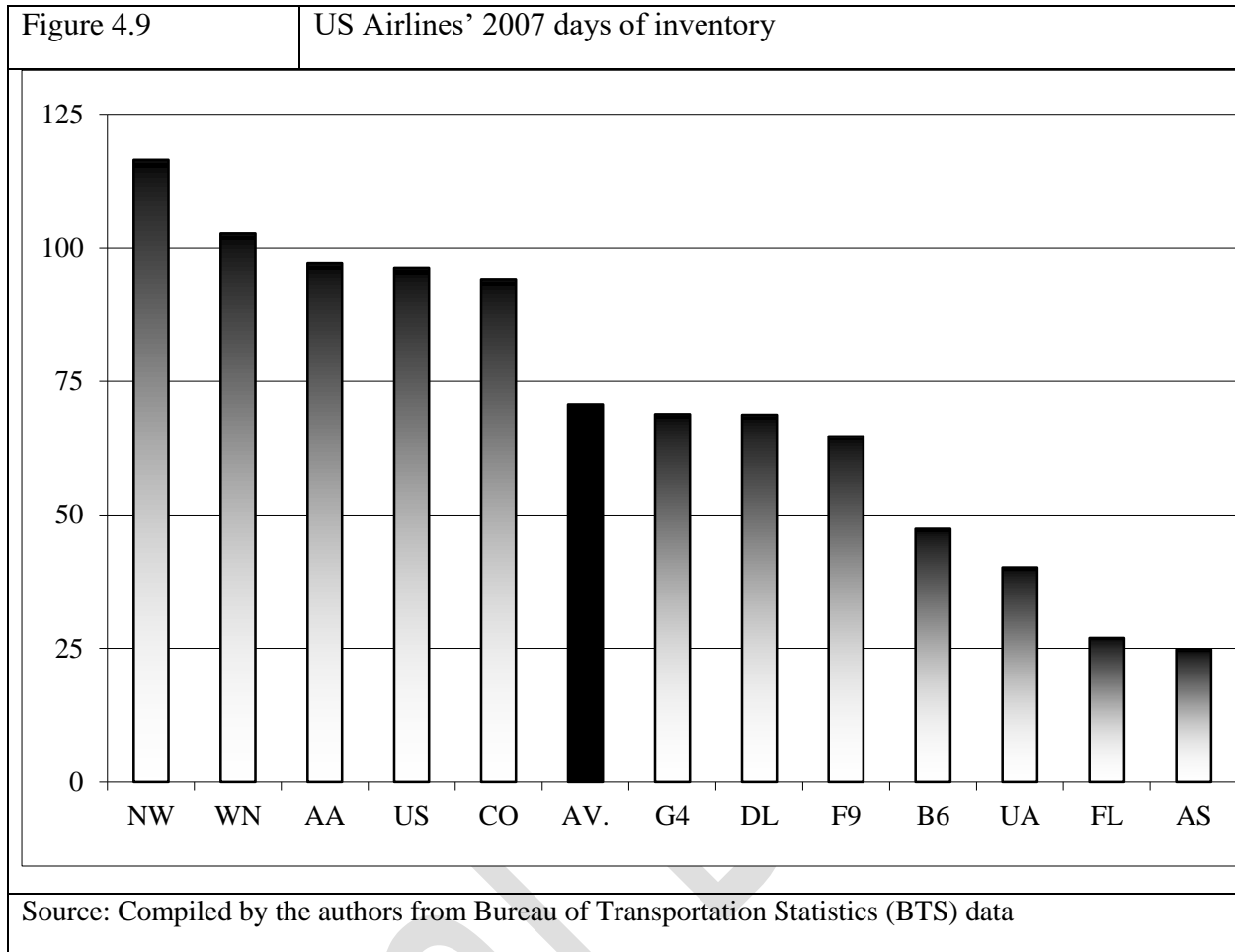
Figure 4.8 provides a comparison of the airlines' days of accounts receivable and days of accounts payable. These metrics should be analyzed together since an airline wants to receive its revenue as quickly as possible and pay its expenses as late as possible. Efficient cash management occurs when the airline's days of accounts receivable are low and when the airline's days of accounts payable are high. Based on figure 4.8, American Airlines (AA), Continental Airlines (CO), and Allegiant Airlines (G4) all seem to have efficient cash management since their spans between days of accounts receivable and accounts payable are all in excess of 30 days. Through the introduction of electronic ticketing and the Internet, airlines have been able to reduce their days of accounts receivable considerably, as evidenced by the fact that the majority of the airlines have days of accounts receivable less than 20. The one exception is Alaska Airlines (AS), whose 58 days of accounts receivable is quite high. One possible reason behind Alaska Airlines high days of accounts receivable would be that a substantial portion of their operating revenue is derived from cargo, which has on average

substantially longer days of accounts receivable than passenger revenue. At times, analyzing accounts payable can be misleading since suppliers may provide cost concessions if the airline pays earlier. Therefore, during negotiations with suppliers, purchasing departments must balance lower unit costs with shorter days of accounts payable. Figure 4.8 shows that most airlines have relatively short days of accounts payable. This is probably due to supplier negotiations for lower unit costs (mentioned above) or other demands placed by suppliers on airlines because of the financial uncertainty of the airline industry. At the extreme of this is US Airways (US) where the days of accounts payable are 3 days. This makes it almost appear that the airline operates on a cash basis. Therefore, the airline receives very little benefit from credit and from the ability to hold onto cash.



The final metric used to analyze an airline's liquidity is the days of inventory, which determines how long, on average, inventory sits before being used. Inventory that is rarely used not only ties up cash that could be used elsewhere, but also incurs carrying costs for storing the inventory. However, too little inventory can cause operational problems resulting in either increased delays and cancellations or increased costs resulting from purchasing aircraft parts from other airlines. Figure 4.9 displays the days of inventory for the twelve US airlines, with the assumption that all inventories are related to aircraft maintenance and repair expenses.²² From figure 4.9, Northwest Airlines (NW) holds inventory the longest while Alaska Airlines (AS) holds inventory the shortest. A possible explanation for Northwest Airlines long days of inventory is that its aging aircraft require more maintenance, and this in turn means that a greater stock of inventory is required. Another important factor that impacts the amount of inventory an airline holds is the number of different aircraft types in the fleet. Obviously, the greater the number of different aircraft types, the greater the inventory required. This means that inventory is one department where airlines can receive the benefits of economies of scale through operating streamlined aircraft fleets (i.e., operating less different types of aircraft). This reasoning could potentially explain the fact that four of the five highest airlines, in terms of days of inventory, operate diverse fleets. The exception is Southwest Airlines and the possible reasons for this were discussed earlier in the chapter.

²² While this assumption is not completely accurate, the majority of inventory held by airlines, in terms of dollars, is for aircraft maintenance. Other categories where inventory will be held includes catering (if applicable) and general supplies.

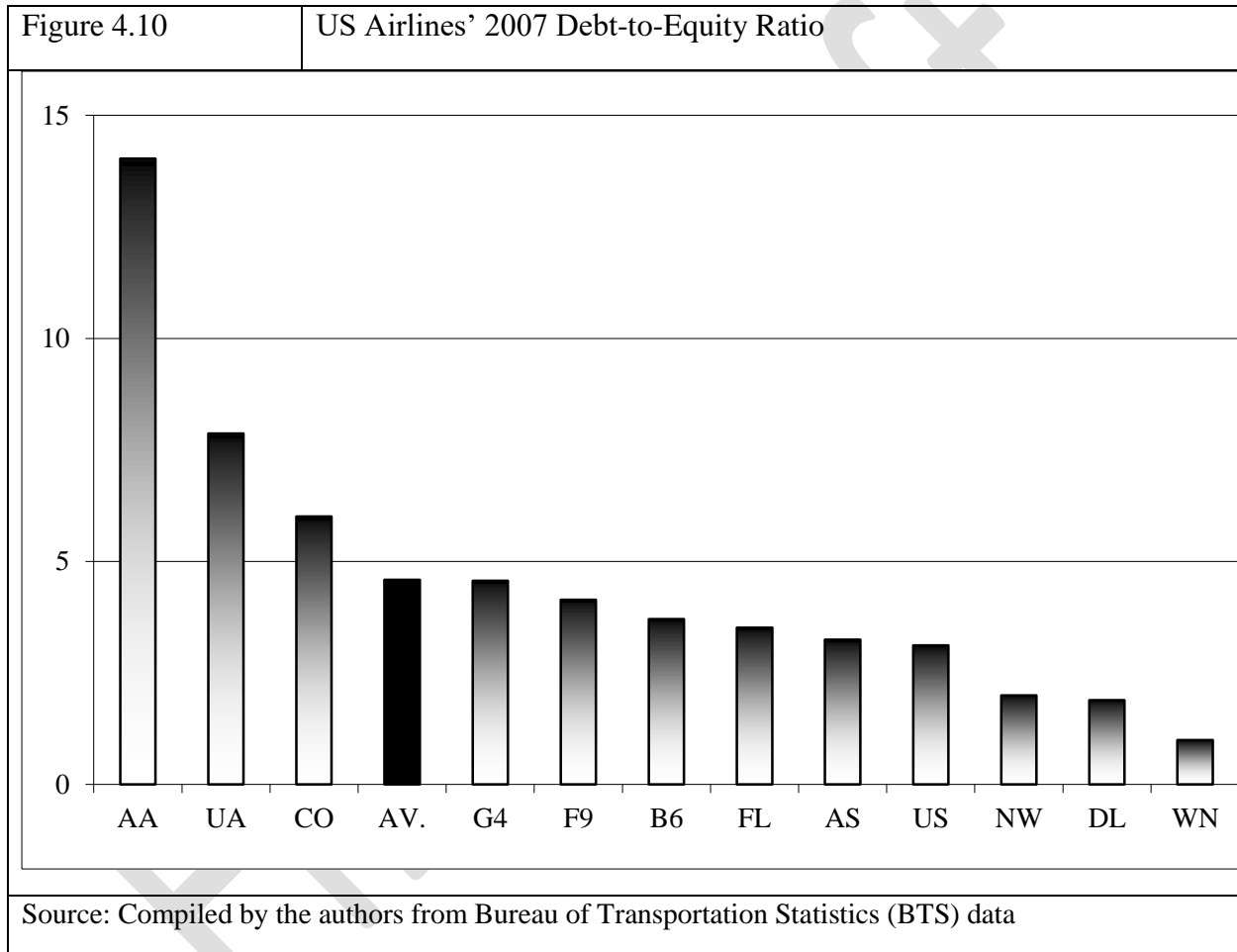


Long-Term Risk Analysis

While solvency analysis deals with assessing an airline’s ability to meet its short-term commitments, long-term risk analysis attempts to help predict the strength of the company in the future. Long-term risk analysis in the airline industry is usually analyzed using the debt to equity ratio, the debt ratio, and the times interest earned ratio. These will be covered in turn.

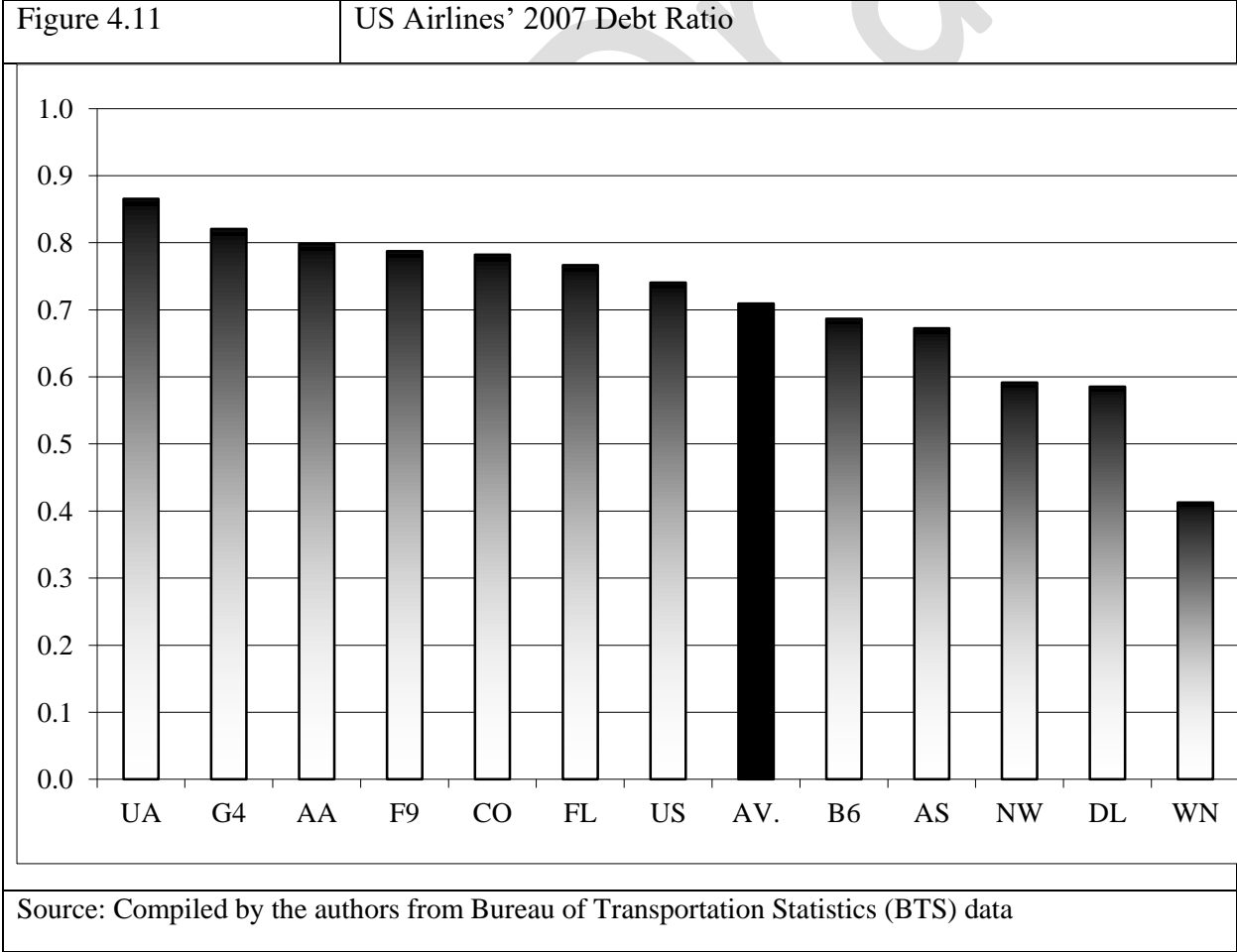
The heavy debt structure of the airline industry can be seen by comparing the debt-to-equity ratios of the twelve airlines. This heavy debt structure in the airline industry is ultimately the result of the immense amount of capital involved in operating an airline, with very large capital expenditures that are incurred for aircraft and facilities. Figure 4.10 shows the debt to equity ratio for twelve US airlines. Note that all carriers have debt to equity ratios greater than 1, indicating that all of the carriers’ capital structures are more heavily debt than equity weighted. The airline with the most balanced capital structure is Southwest Airlines (WN) as its debt to

equity ratio is almost equal to 1. At the other end of the spectrum is American Airlines (AA), whose debt to equity ratio of 14 indicates that for every \$1 in equity, American Airlines has \$14 in debt. The cost of debt financing is reflected in interest expense. An airline that is highly leveraged in debt financing will incur greater amounts of interest expense and this increases the volatility of the company's earnings. On the other hand, the airline hopes that the use of debt financing will increase profits sufficiently to offset the increased interest expense.

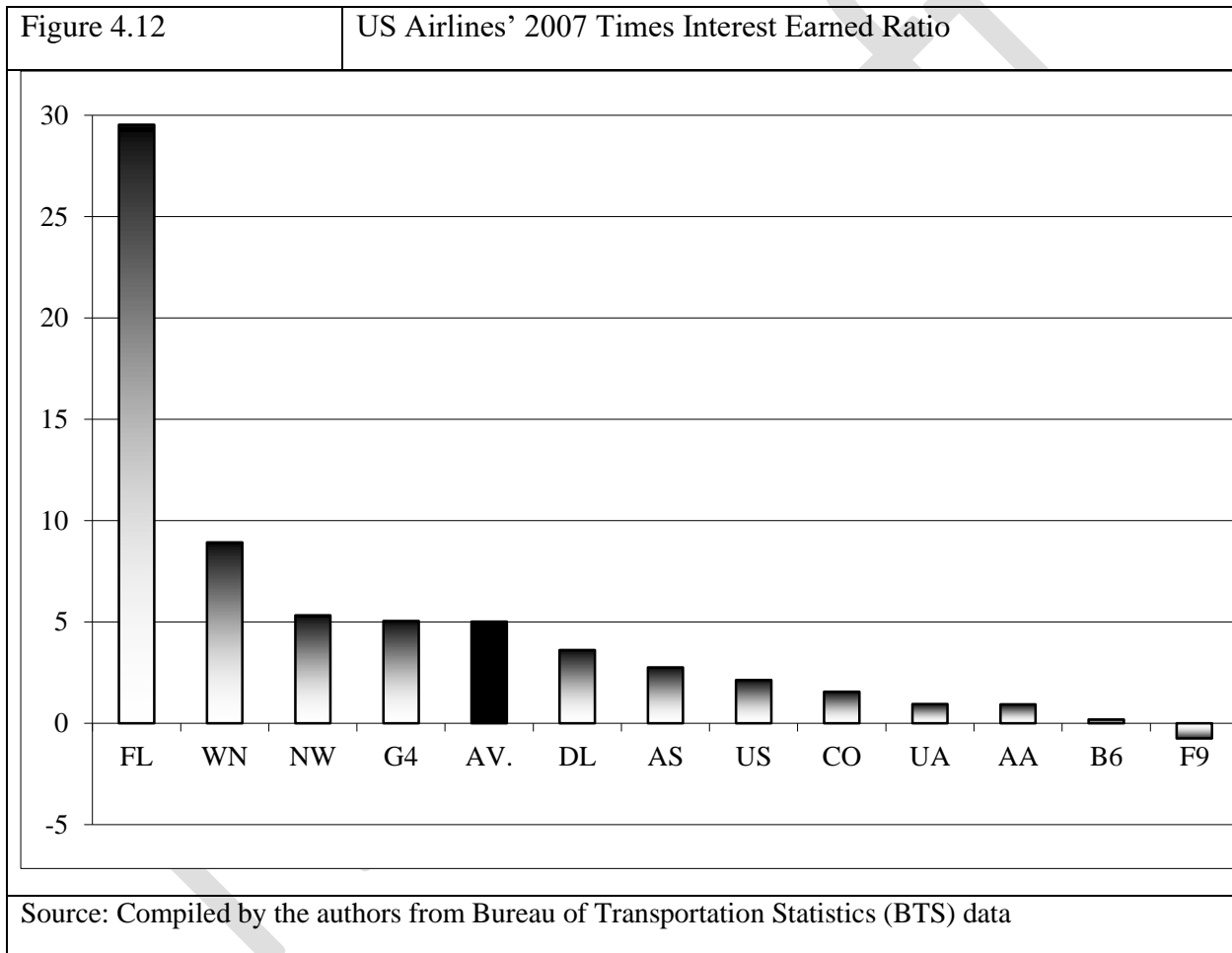


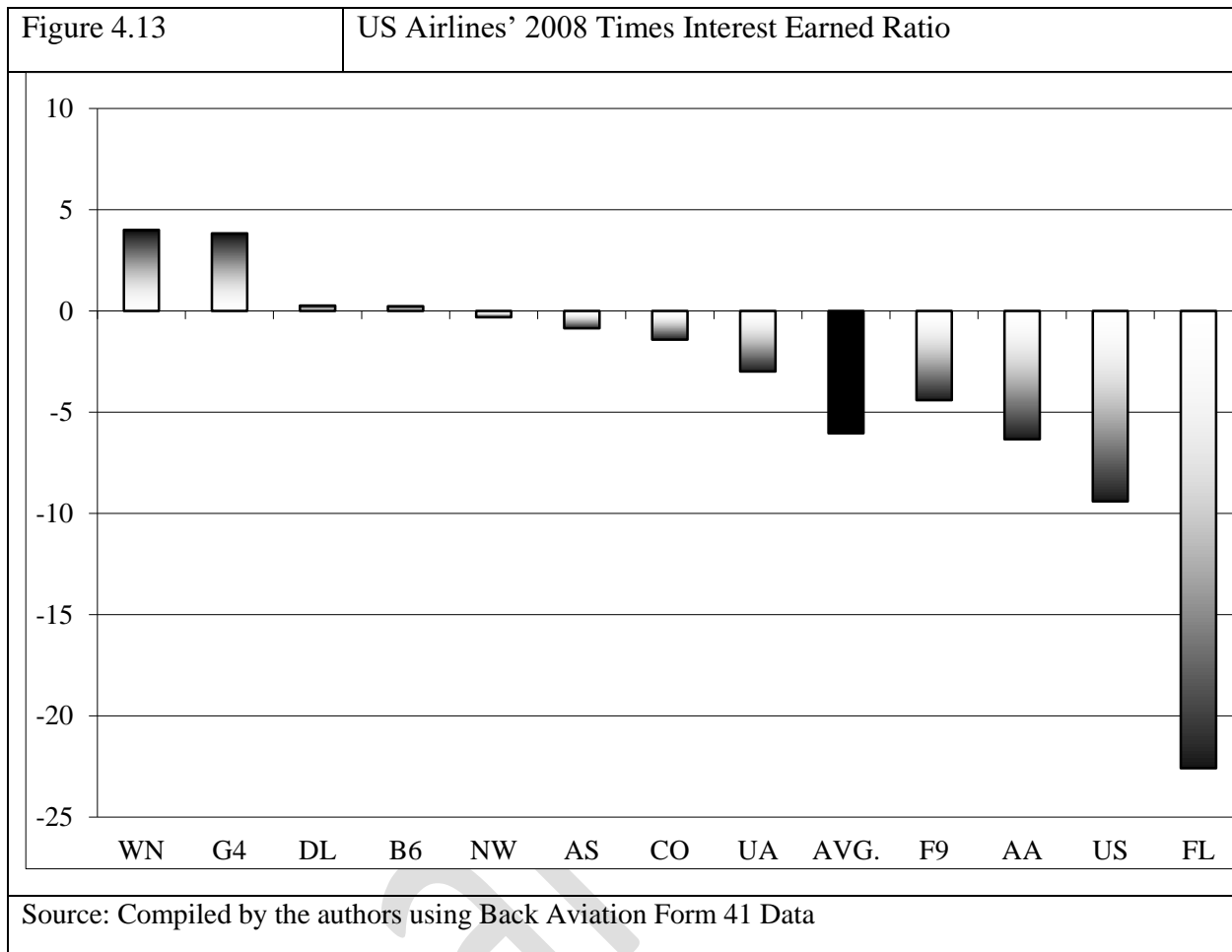
Another debt based long-term risk metric is the debt ratio, which shows the total portion of assets financed by debt. A high debt ratio generally indicates a firm with greater risk since there are fewer assets that can be used to cover the debt. Also, this lack of assets may raise the cost of debt in the future since there may be more uncertainty and risk to the lender. Therefore, from a long-term risk perspective, an airline with a lower debt ratio is generally less risky than a higher debt ratio airline. Based on the information contained in figure 4.11 and, using the

rational explained above, the riskiest airline is United Airlines (UA) with a debt ratio greater than 0.80, and the least risky of the US airlines is Southwest Airlines (WN) with a debt ratio of about 0.40. It is interesting to note that both Delta Air Lines (DL) and Northwest Airlines (NW) have relatively low debt ratios. This is likely the result of bankruptcy reorganization where the airlines could modify their debt structure. Note that Allegiant Airlines (G4), whose profitability ratios were some of the best in the industry, has the second highest debt ratio. Clearly Allegiant has used debt financing to generate increased profitability, but this has come with the increased risk of taking on too much debt. In the long-term, Allegiant must continue maintaining outstanding operational results, or the level of debt could be a problem in the future. This example highlights the fact that all of the ratios need to be analyzed when evaluating the financial strength or weakness of an airline.



Airlines with high debt ratios can expect increased interest expenses resulting from a larger debt load. The times interest earned ratio, displayed in figure 4.12 for twelve US airlines, helps measure the airline's ability to meet its debt payments. A times interest earned ratio of less than one indicates that the airline does not generate enough earnings to cover its interest expense. A negative times interest earned (TIE) ratio indicates that the airline could fail to meet its interest payments and this could result in bankruptcy. Frontier Airlines' (F9) negative times interest earned ratio in 2007 was ultimately a signal of the airline declaring bankruptcy in 2008.





In 2008 the majority of the airlines shown in figure 4.13 had negative times interest earned ratios. This indicates that these airlines have negative earnings, which severely impacts their ability to pay their debt. The only airlines which could comfortably pay their debt (had TIE's over 1) were Southwest Airlines and Allegiant Air.

Stock Market Analysis

Another methodology used to analyze the airline industry is the external view of the airline. The price of the stock of a company or an airline varies according to the external perception of the company. The stock market is also the means by which airlines gain equity investment and it also helps signal the long term financial prospects of the airline. Since stock market prices change daily, ratios that contain these prices must be fixed at a certain point of time. Therefore, for comparison purposes, the data contained in table 4.2 are based on market

statistics generated at market closing on March 5, 2009. Due to negative profits in 2008, all of the earnings per share (EPS) ratios are going to be negative except for the two carriers who made a profit in 2008, Allegiant and Southwest.

Table 4.2		US Airlines' stock market data as of 03/05/2009	
Airline Name	Company Ticker Symbol	Market Price (@ 03/05/09)	EPS (@ 03/05/09)
AirTran	AAI	\$2.56	(\$2.51)
Alaska Airlines	ALK	\$14.80	(\$3.74)
Allegiant Airlines	ALGT	\$33.83	\$1.73
American Airlines	AMR	\$2.54	(\$8.00)
Continental Airlines	CAL	\$7.26	(\$5.52)
Delta Air Lines	DAL	\$3.93	(\$19.06)
Frontier Airlines	FRNTQ.PK	\$0.20	(\$3.49)
JetBlue	JBLU	\$2.84	(\$0.34)
Southwest Airlines	LUV	\$5.01	\$0.24
United Airlines	UAUA	\$3.06	(\$42.18)
US Airways	LCC	\$1.97	(\$22.06)

Source: Compiled by the authors from Yahoo! Finance (3/6/09)

Based on the data compiled in table 4.2, the price-earnings ratio can be calculated, which helps standardize the expectations of future earnings. Unlike many metrics which are backward looking, the price-earnings ratio provides some forward-looking information. This is because the price of the airline's stock is based on future cash flows. Table 4.3 displays the price-earnings ratio for eleven US carriers (Note however that Frontier Airlines is still in bankruptcy which affects their stock price). Investors want a higher price-earnings (PE) ratio, all other things equal, when investing in a company because it demonstrates that the company is using the money

invested to generate earnings. Southwest Airlines had the highest PE ratio as of March 5, 2009 with a PE ratio of 20.88; the industry average PE ratio was 2.28 with most of the carriers showing negative PE ratios.

Table 4.3		US Airlines' Price-Earnings Ratio as of 03/05/2009	
Airline Name	Market Price (@ 03/05/09)	EPS (@ 03/05/09)	PE Ratio
AirTran	\$2.56	(\$2.51)	-1.02
Alaska Airlines	\$14.80	(\$3.74)	-3.96
Allegiant Airlines	\$33.83	\$1.73	19.55
American Airlines	\$2.54	(\$8.00)	-0.31
Continental Airlines	\$7.26	(\$5.52)	-1.32
Delta Air Lines	\$3.93	(\$19.06)	-0.21
Frontier Airlines	\$0.20	(\$3.49)	-0.06
JetBlue	\$2.84	(\$0.34)	-8.35
Southwest Airlines	\$5.01	\$0.24	20.88
United Airlines	\$3.06	(\$42.18)	-0.07
US Airways	\$1.97	(\$22.06)	-0.09
<i>Average</i>			2.28
Source: Derived from Data Compiled by the authors from Yahoo! Finance			

Usually most stock market analysis of an industry would include calculating dividend yield and dividend payout ratios; however, of the airlines listed above, only Southwest Airlines had issued or declared any dividends. Since dividends are usually issued by more financially stable companies, this is a good indication of the state of the industry. That is, of the carriers competing in the US market, only Southwest Airlines felt it was financially stable enough to distribute dividends. This is probably not surprising considering the extreme volatility of the airline industry.

Operational Analysis

The final level of analysis of any company is operational efficiency. In the airline industry, analysis of operations can be quite involved; however, there are a few simple operational metrics that include the analysis of operating costs versus operating revenue.

Figure 4.14 displays the direct operating costs per available seat mile (CASM) for twelve US carriers in 2007. Operating CASM standardizes the direct operating expenses associated with operating flights, providing a more accurate analysis of the airlines' operations. Not surprisingly, four of the five carriers with the lowest operating CASMs in 2007 are all classified as low-cost carriers. Of the major network carriers, Alaska Airlines (AS) and US Airways (US) had the highest cost structure in 2007, with the next five network carriers all having similar CASMs.

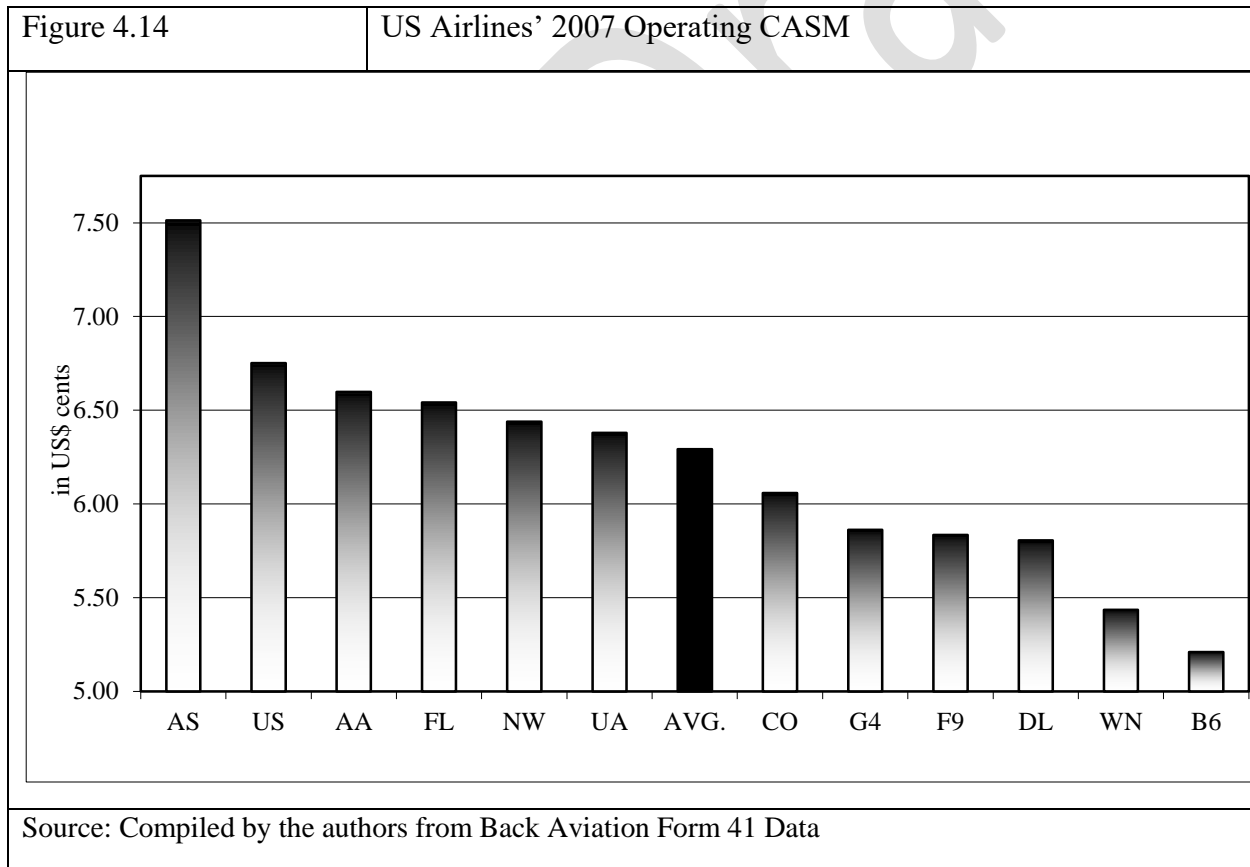
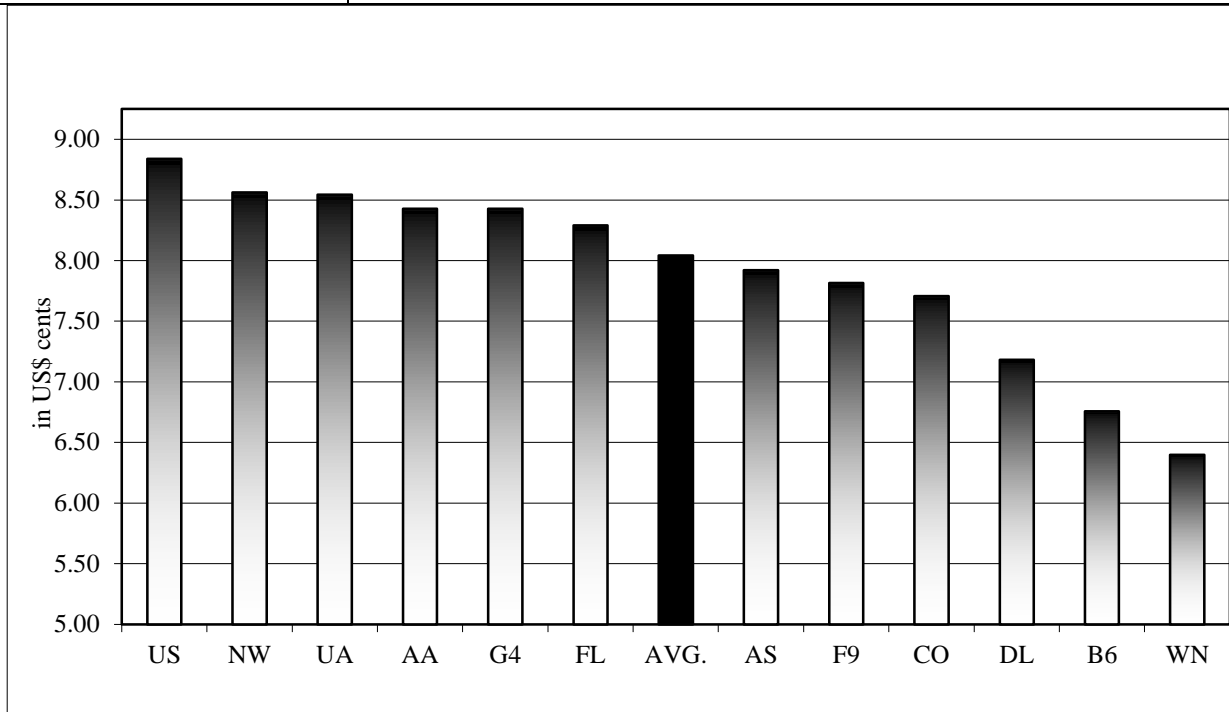


Figure 4.15 shows the operating CASM for the same twelve airlines in 2008. As one can see by comparing with figure 4.14, operating CASM for 2008 went up from 2007. This is in large part due to the increase in fuel prices during 2008.

Figure 4.15

US Airlines' 2008 Operating CASM

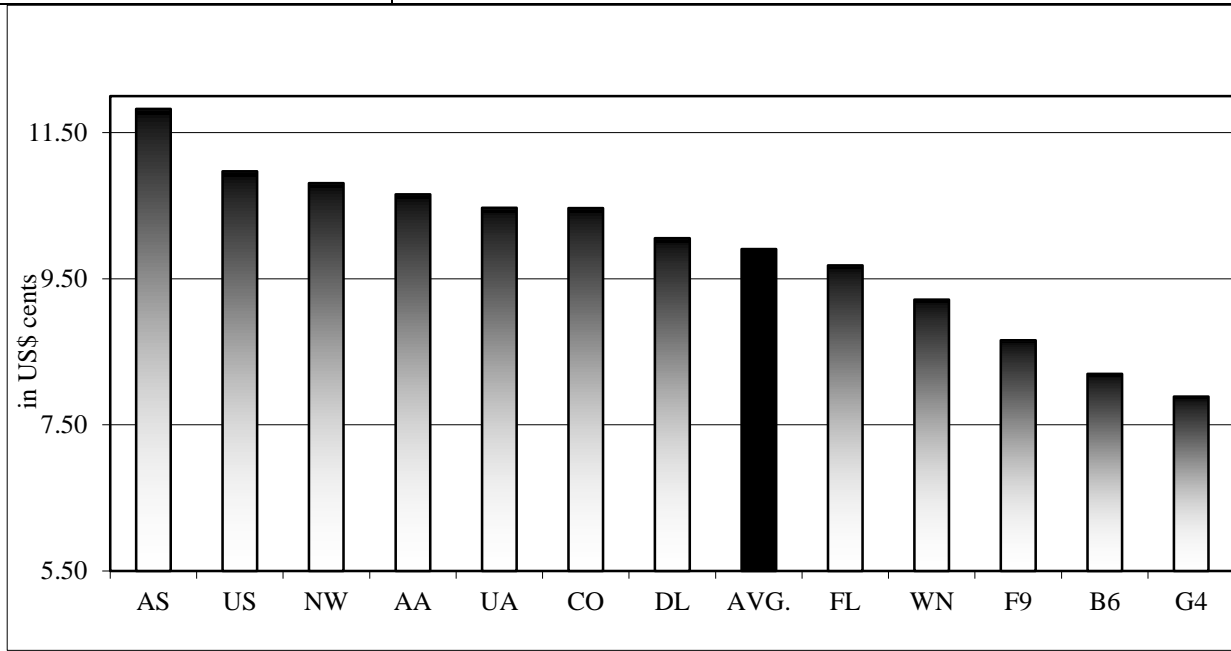


Source: Compiled by the authors from Back Aviation Form 41 Data

Analyzing the other portion of the income statement there is once again a large difference between network carriers and low-cost carriers in terms of revenue. On the revenue side, the network carriers had the greatest revenue per available seat miles (RASMs) in 2007, with Alaska Airlines and US Airways leading the industry. US Airways strong RASM should help offset their high operating costs. Part of the explanation for the revenue differentiation is the result of airlines catering to different market segments. Network carriers fly internationally where revenue yields are typically higher, and the network carriers can differentiate their product in this market segment by offering first class and business class service. The airline with the lowest RASM, Allegiant Airlines (G4), is able to compensate for their low revenue per available seat mile by having low operating costs. Therefore, both RASM and CASM need to be compared, since they both help explain the operational performance of the airlines.

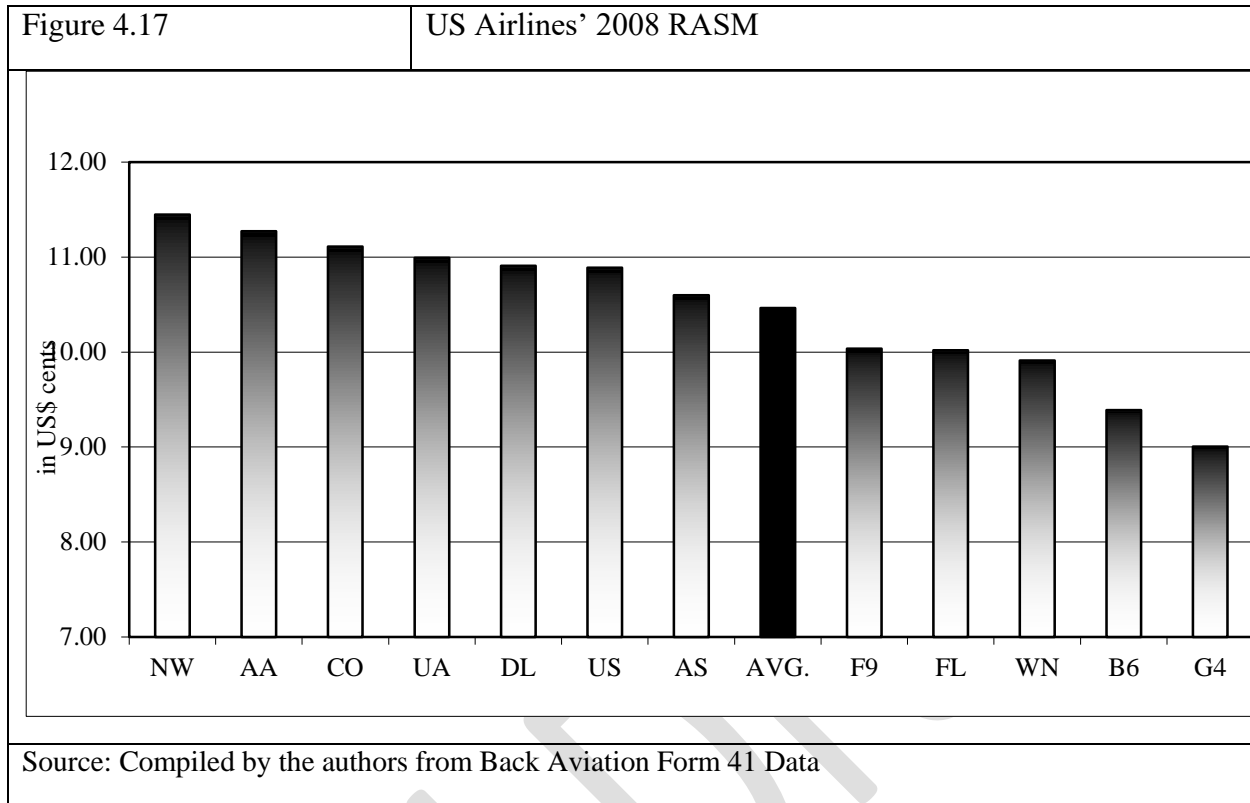
Figure 4.16

US Airlines' 2007 RASM



Source: Compiled by the authors from Back Aviation Form 41 Data

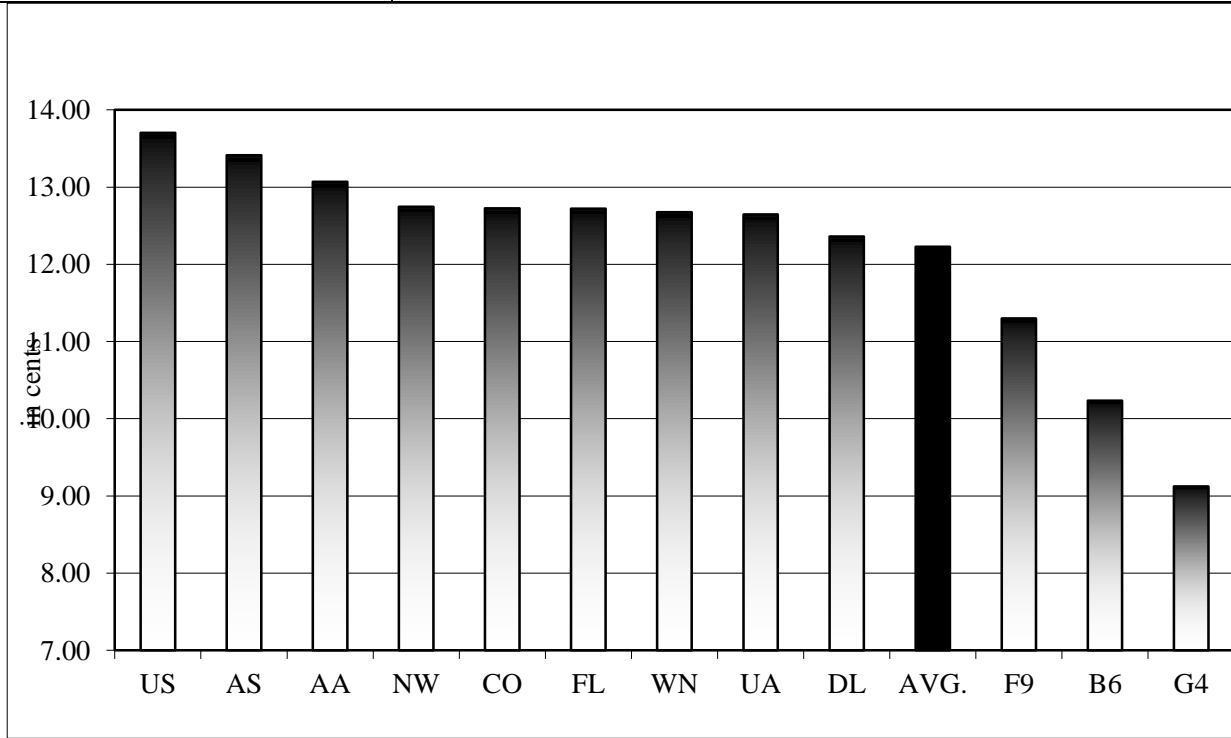
Figure 4.17 shows revenue per available seat mile in 2008. The average RASM for the industry did not change much between 2007 and 2008. Northwest Airlines (NW) and American Airlines (AA) had the highest revenue per available mile during the year.



Another revenue metric is revenue per revenue passenger mile (RRPM), which represents the average amount of revenue generated by a revenue passenger over one mile, also referred to as an airline's yield. Since RASM results can be impacted by load factor, RRPM measures how much revenue the airline can generate from a typical passenger without considering the problem of load factor. Figure 4.18 shows that US Airways (US) had the greatest RRPM in the industry. Typically, airlines with short stage lengths are able to receive higher passenger yields, and this could help explain US Airways lead in RRPMs, since US Airways has several short-haul routes along the eastern United States seaboard. Airlines with relatively longer average stage lengths, like Frontier Airlines (F9) and JetBlue (B6) have lower yields when compared to the industry. Overall, most of the carriers are fairly close in terms of RRPMs, indicating fierce revenue competition that has resulted from fare matching. Because of this, it is very difficult for airlines to differentiate themselves in terms of revenue generation. For this reason, the industry has placed greater importance on controlling operating costs.

Figure 4.18

US Airlines' 2007 RRPM

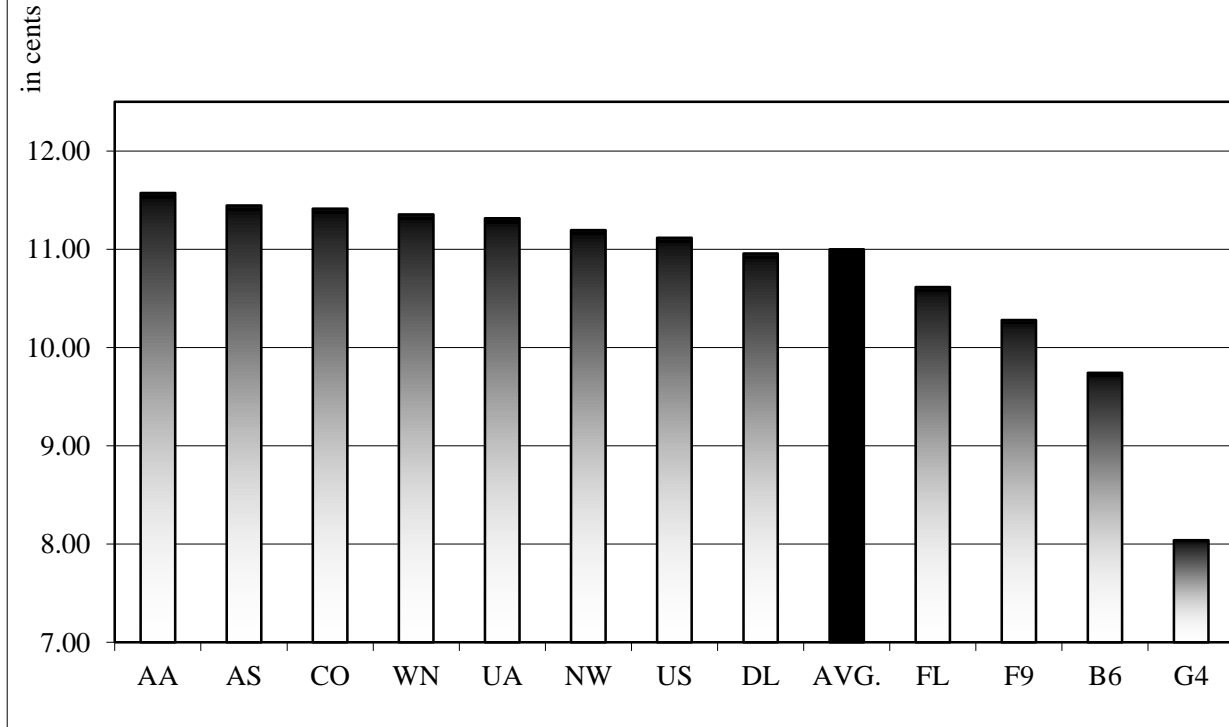


Source: Compiled by the authors using Back Aviation Form 41 Data

Figure 4.19 shows RRPM in 2008. In comparison to 2007, airline yields dropped from about 12 cents per revenue passenger mile to about 11 cents per revenue passenger mile in 2008. This indicates increase price competition across the industry, in part due to reductions in overall demand.

Figure 4.19

US Airlines' 2008 RRPM

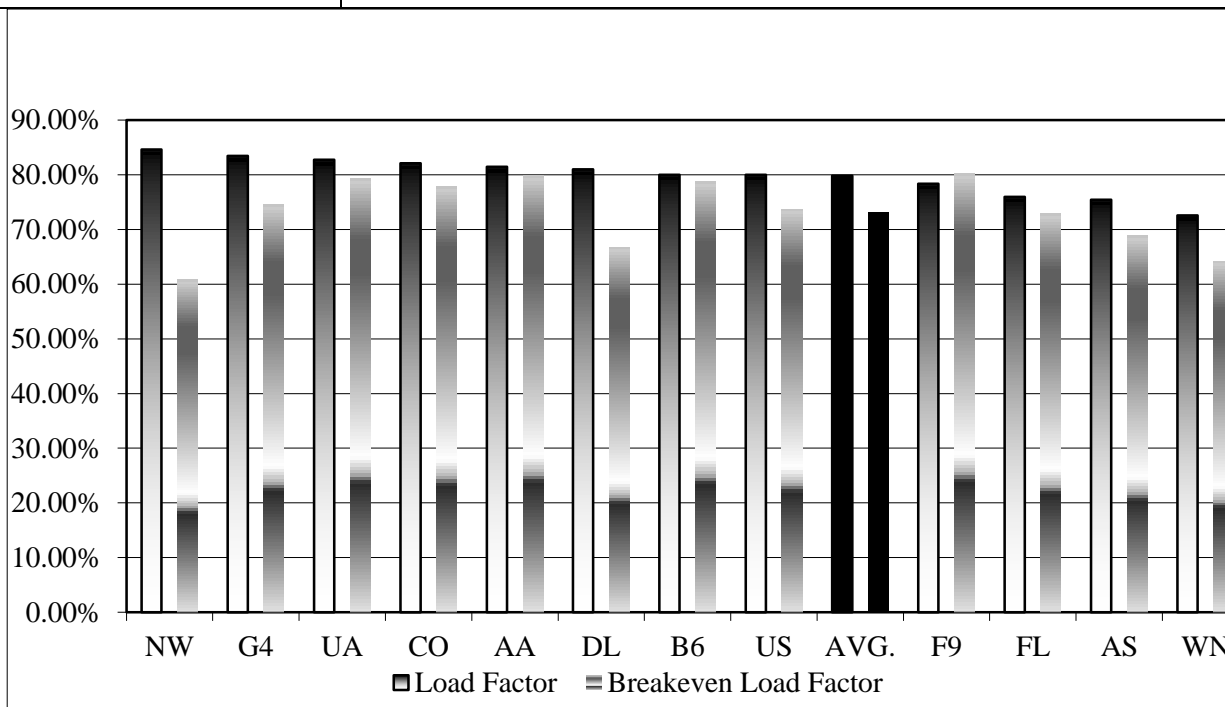


Source: Compiled by the authors using Back Aviation Form 41 Data

Finally, one of the most common, yet simplistic, measurements of an airline's operation is load factor. Load factor simply provides the percentage of an airline's inventory that is filled by revenue passengers. However, load factor does not take into consideration any of the revenue or operating costs of the airline; therefore, the metric alone is not terribly useful, as the passenger load factor can easily distort an airline's financial image. In order to be useful, load factor needs to be compared with the breakeven load factor (percentage of the plane which must be filled in order for the airline to breakeven at its current cost structure), with the difference between the two indicating the level of profitability. From figure 4.20 we can see that most airlines were able to operate at a load factor greater than their breakeven load factor in 2007. At 64% the airline with the lowest breakeven load factor was Southwest Airlines (WN). And interestingly, Southwest also had the lowest actual load factor in 2007. Southwest's industry-leading breakeven load factor is the result of its low operating costs and relatively high passenger yields.

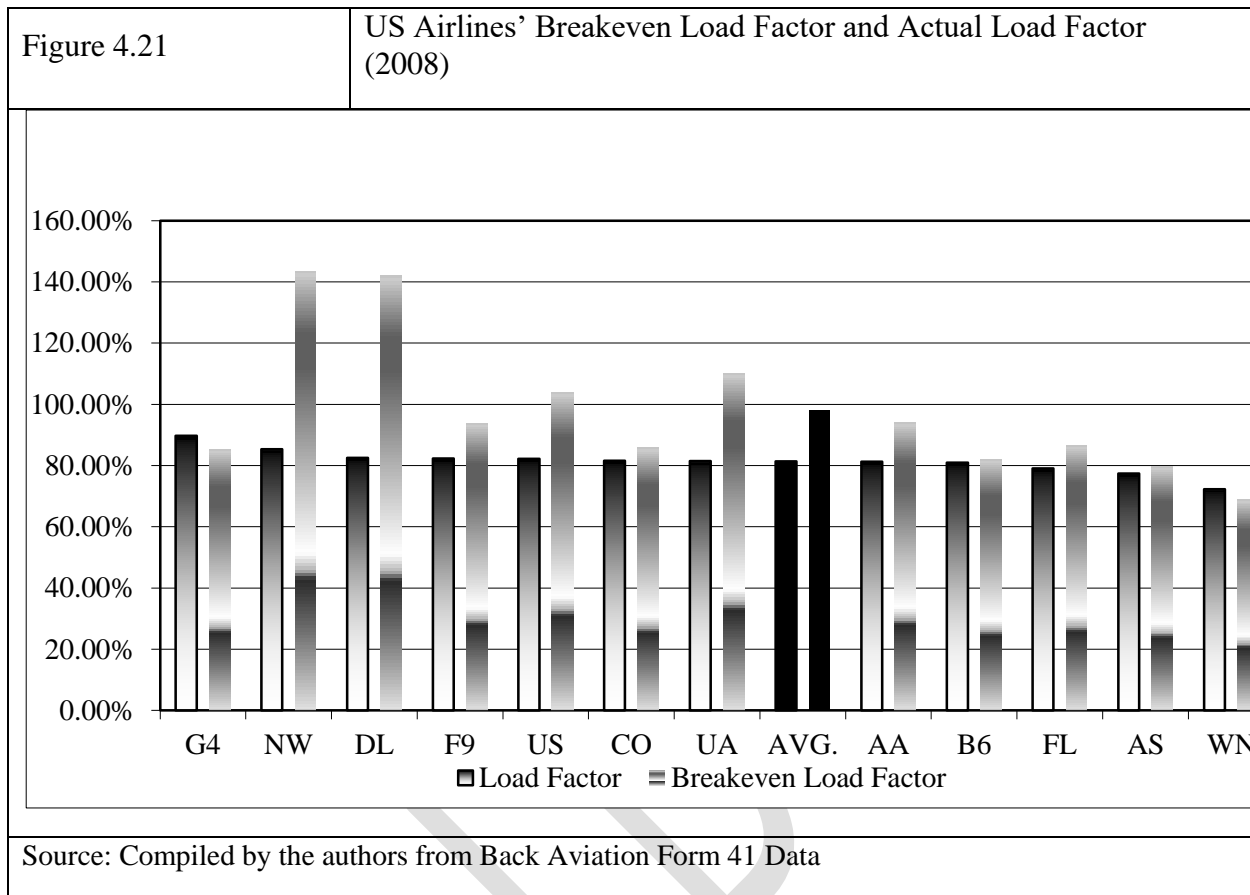
Figure 4.20

US Airlines' Breakeven Load Factor and Actual Load Factor (2007)



Source: Compiled by the authors from Back Aviation Form 41 Data

Figure 4.21 shows that the difference between actual load factor and breakeven load factor reveals a much different picture in 2008 than it did in 2007. Four airlines (Northwest, Delta, US Airways, and United) had breakeven load factors of over 100%. This means that at their 2008 cost and yield structure these airlines will not be profitable even if they fill all of their seats on every flight. These airlines will need to reduce costs and/or increase yield in order to maintain their level of operations. Several other airlines also had breakeven load factors greater than their actual load factor in 2007, while not in as bad of a position as the four carriers with breakeven load factors over 100%, these airlines will also need to lower costs or improve yields in order to return to profitability.



By benchmarking the US airline industry through the use of profitability, liquidity, long-term risk, stock market related, and operational ratios, some general conclusions can be drawn about the industry and individual airlines. Overall, the industry was profitable in 2007; however, several of the operational, liquidity, and long-term risk ratios show an industry that has great difficulties and challenges, especially when compared to other industries. Of the low-cost carriers, both Southwest Airlines (WN) and Allegiant Airlines (G4) appear to have strong results, especially in terms of profitability; however, Allegiant does appear to have some liquidity issues that need to be addressed. Of the network carriers, Alaska Airlines (AS) had solid results throughout 2007, while US Airways (US) has some interesting operational results. The data for 2007 show that if US Airways can reduce its costs, while maintaining its passenger yields, the airline could potentially have strong financial success. However, the reduction in operating expenses is very difficult especially when the airline is struggling through a merger. Of all the airlines, Southwest Airlines appears the most stable and financially solid. This is not

surprising considering its long history of financial success. However, Southwest Airlines is not immune from the multitude of challenges facing the airline industry – it may just be the best positioned airline to survive the challenges.

Predicting Insolvency

Airlines are known for their vulnerability to insolvency (Gritta, Adrangi, and Sergio, 2004). Many airlines have been under bankruptcy protection of Chapter 11 and some airlines went bankrupt even when the market conditions were favorable. More than nine airlines have already filed for bankruptcy or ceased operations since December 2007, with many airlines blame the significant increase in fuel costs as a major contributing factor. Many airlines such as Air Midwest, Aloha Airlines, ATA Airlines, Big Sky Air, Delta Air Lines, Northwest Airlines, Champion Air, EOS Airlines, Frontier Airlines, MAXjet Airways, and Skybus Airlines have filed for bankruptcy or have ceased operations (GAO, 2008).

In 2005 more than half of the U.S. airline capacity was with airlines that were acting under chapter 11 bankruptcy protection (Isidore, 2005). Chapter 11 allows U.S. airlines the possibility of existing even after bankruptcy. This fact has caused much concern, especially among the solvent airlines, as the following quote aptly demonstrates: “There is much concern that companies are taking advantage of the liberal U.S. bankruptcy laws, to the extent that incompetent executives keep their jobs, poorly managed companies survive, better managed companies are faced with unfair competition, and bankruptcy lawyers profit from unreasonably high fees... But the real problem may be that the stigma which once accompanied bankruptcy filing is gone” (Yang, Galen, 1993).

With bankruptcy so prevalent in the airline industry, are there any indices or measures that might predict insolvency? Many ratios are useful in predicting the financial health of an airline. For example, traditional ratio analysis is a frequently used tool for financial analysis. Presently, there are three theories that predict the likelihood of insolvency and these can be used to help investment decisions. These are: the Altman Z-score model, the Springate Z-score model, and the Fulmer H-score model. These models will be discussed in turn.

Altman's Z-score Model for Private Industrial Companies

$$Z = 6.56A + 3.26B + 6.72C + 1.05D$$

with:

$$A = \frac{\text{Working Capital}}{\text{Total Assets}}$$

$$B = \frac{\text{Retained Earnings}}{\text{Total Assets}}$$

$$C = \frac{\text{EBIT}}{\text{Total Assets}}$$

$$D = \frac{\text{Market Value of Equity}}{\text{Book Value of Total Debt}}$$

The status of the company according to Altman's z-score model for private industrial companies is as follows:

- Healthy private company: $z > 2.6$
- Grey zone: $1.1 < z < 2.59$
- Unhealthy company: $Z < 1.1$

Springate's Z-score Model

$$Z = 1.03A + 3.07B + .66C + .4D$$

with:

$$A = \frac{\text{Working Capital}}{\text{Total Assets}}$$

$$B = \frac{\text{Net Profit Before Taxes}}{\text{Total Assets}}$$

$$C = \frac{\text{EBIT}}{\text{Total Assets}}$$

$$D = \frac{\text{Sales}}{\text{Total Assets}}$$

A company may be classified as "failed" when the calculated Z value is less than .862.

Fulmer's H-value Model

$$H = -6.075 + 5.528V_1 + .212V_2 + .073V_3 + 1.27V_4 - .12V_5 + 2.335V_6 + .575V_7 + 1.083V_8 + .894V_9$$

with:

$$V_1 = \frac{\text{Retained Earnings}}{\text{Total Assets}}$$

$$V_2 = \frac{\text{Sales}}{\text{Total Assets}}$$

$$V_3 = \frac{\text{EBIT}}{\text{Total Equity}}$$

$$V_4 = \frac{\text{Cash Flow}}{\text{Total Debt}}$$

$$V_5 = \frac{\text{Debt}}{\text{Equity}}$$

$$V_6 = \frac{\text{Current Liabilities}}{\text{Total Assets}}$$

$$V_7 = \log(\text{tangible total assets})$$

$$V_8 = \frac{\text{Working Capital}}{\text{Total Debt}}$$

$$V_9 = \frac{\log(\text{EBIT})}{\text{Interest Expenses}}$$

Companies with a negative H value may be a strong candidate for insolvency.

Table 4.4 shows Altman's Z-Score Model for Private Industrial Companies, Springate's Z-Score Model, and Fulmer's H-Score Model applied to U.S. Airlines for 2007 data.

Table 4.4		Altman's Z-Score Model for Private Industrial Companies, Springate's Z-Score Model, and Fulmer's H-Score Model applied to U.S. Airlines (2007)			
	Altman	Altman	Springate	Fulmer	
	Public Industrial	Private Industrial			
American Airlines	0.9	-0.4	0.3	-2.6	
Alaska Airlines	1.2	1.1	0.5	-0.9	
JetBlue Airways	0.7	0.3	0.2	-2.6	
Continental Airlines	1.4	0.4	0.6	-1.3	
Delta Air Lines	1.1	0.8	0.4	-1.1	
Frontier Airlines	1.3	-0.1	0.3	#NUM!	
AirTran Airways	1.4	0.5	0.6	-0.8	
Allegiant Air	1.9	-0.6	0.7	-0.5	
Northwest Airlines	1.2	1.5	0.6	-1.0	
United Airlines	0.9	-0.2	0.3	-2.0	
US Airways	1.5	0.5	0.6	-1.3	
Southwest Airlines	1.8	2.3	0.4	1.0	

Notes:
- Data used is consolidated data, so it includes subsidiaries
- DL, NW and UA came out of chapter 11 in this year; results have been added up for the periods in & out chapter 11
- Frontier Airlines' H-Value cannot be calculated due to negative value of EBIT; log of negative value cannot be calculated.

As table 4.4 amply demonstrates, the airline industry is not in particularly good financial condition at least as far as these particular models are concerned. Once again, the most

successful airline overall is Southwest Airlines, although even Southwest has some low scores. United and American Airlines appear to have the lowest scores from these models and this was also confirmed through some of the ratio analysis earlier in the chapter. This problem is consistent with the financial difficulty that the airline industry has experienced in this period.

Summary

This chapter covered financial ratio analysis using measures of profitability, liquidity, stock market, and operational metrics. The various ratios were defined and discussed individually and Southwest Airline's data for 2007 were used to give quantitative examples of how the ratios might actually be calculated. The results were then analyzed and discussed. Following this, the ratios were used to benchmark (compare) many of the largest airlines in the US airline industry. Finally, three measures were introduced that might indicate a tendency toward an insolvency. These were then used to calculate the values for the airlines compared in the benchmarking process.

Appendix 1: IATA Two-letter Airline Codes- US Carriers

Table 4-A.1	
Two-letter code	Airline
AA	American Airlines
AS	Alaska Airlines
B6	JetBlue Airways
CO	Continental Airlines
DL	Delta Air Lines
F9	Frontier Airlines
FL	AirTran Airways
G4	Allegiant Air
NW	Northwest Airlines
UA	United Airlines
US	US Airways
WN	Southwest Airlines

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