

PERFORMANCE ASSESSMENT OF MAJOR U.S. AIRLINES VIA CASH FLOW RATIOS

Stepanyan Armen

*Accounting department, Faculty of Economics and Business Administration, West University of Timisoara, Timisoara, Romania
astepanyan8@gmail.com*

Abstract: *The paper addresses the assessment of major U.S. airlines' liquidity and solvency based on information disclosed in the statements of cash flows as part of their 10-K Form annual reports filed with the Securities and Exchange Commission. Conducting financial statement analysis for major U.S. airlines has generated deep interest in and a significant importance towards using various frequently used cash flow ratios to gauge U.S. airlines' viability both in the short term and long term in that cash flow information is more reliable and more revealing. The main purpose of this paper is to gain a thorough insight into the financial performance of U.S. airlines for the last five consecutive years using cash flow information as a supplement to the traditional ratio analysis. For this analysis various cash flow ratios for measuring a company's liquidity and going concern status are used and described. The paper covers the cash flow analysis for both the legacy carriers (Delta Airlines Inc., United Airlines Inc, American Airlines Inc, Continental Airlines Inc., US Airways Inc) which had been founded before the passing of the U.S. airline deregulation act in 1978 and two major low-cost carriers (Southwest Airlines Co. and JetBlue Airways). All cash flow ratios for the selected U.S. carriers have been calculated based on information from their three main financial statements: the balance sheet, income statement and the statement of cash flows for the period from 2007 to 2011. The U.S. airline industry has been significantly affected by the recent economic crisis and skyrocketing jet fuel prices. Therefore, the results of the cash flow analysis show that for the most part selected U.S. airlines have liquidity problems and are likely to face financial difficulties in terms of meeting ongoing financial commitments in the long term which, in fact, explains why major U.S. airlines are highly leveraged being dependent on external sources of financing. The paper may be useful for those who have interest in financial statement analysis.*

Keywords: *Cash flow; ratio analysis; financial statement; earnings; liquidity; airline industry*

JEL classifications: *M41; M20*

1. Introduction

Traditional ratios employed to assess profitability and risk may not reveal the full picture of the company's financial performance, and in order for us to have a comprehensive understanding we need to additionally use information from statements of cash flows for further analysis. The cash flow analysis is deemed as one of the most important techniques in the overall financial statement analysis and has recently been broadly used by many analysts, corporate managers and auditors to evaluate the company's short-term liquidity and long-term solvency.

For the last two decades different authors have attempted to develop cash flow ratios to evaluate companies' liquidity and solvency based on information from statements of cash flows because it allows creditors, analysts and investors to broaden the analysis of the company's performance.

Mills and Yamamura (1998) state that when analyzing the company's liquidity cash flow information is more reliable than information from balance sheet and income statement because balance sheet data are static whereas the income statement contains different non-cash items. They proposed eight cash flow ratios that can be used to measure the company's liquidity and viability as a going concern.

Giacomino and Mielke (1993) claim that cash flow ratios are more useful in evaluating a company's financial strength and profitability. For this purpose, they have proposed nine cash flow ratios that can be employed to assess the sufficiency of cash flows necessary to meet financial and operational obligations.

Figlewicz and Zeller (1991) also developed and examined several cash flow ratios based on the statement of cash flows. The purpose of the study was to find out whether the cash-flow-based analysis might provide supplementary insight into the financial performance and liquidity of a company. For the computation of proposed ratios they used annual reports of W.T Company to find out if they provide additional information. The outcome was that apart from the traditional approach to ratio analysis they, indeed, provide supplementary information on a company's liquidity and financial performance in general. Subsequently, more ratios based on the statement of cash flows were proposed by Schmidgall, Geller and Ilvento (1993).

Carlsaw and Millis (1991) in their study identified a few cash flow ratios that measure liquidity and solvency. Those ratios are cash interest coverage, cash debt coverage and cash dividends coverage.

For the cash flow analysis of selected U.S. airlines we will use cash flow ratios proposed by John R. Mills and Jeanne H. Yamamura in their article titled "Power of cash flow ratios" (1998).

2. The Assessment of Major U.S. Airlines Financial Condition Using Cash Flow Ratios

The methodology of the research is analytical and involves computing cash flow ratios based on information from the statements of cash flows of the selected U.S. airlines for 5 consecutive years (2007-2011). As a basic source of information, we will use U.S. airlines' 10-K Form annual reports filed with the Securities and Exchange Commission and obtained from EDGAR database. The main purpose of the research is to evaluate U.S. airlines' risk and financial performance via cash flow analysis.

Creditors and lenders have a concern in the company's ability to pay off its short-term and ongoing financial obligations, and using cash flow ratios provides us with more reliable information on whether the company is capable of meeting its commitments. According to John R. Mills and Jeanne H. Yamamura (1998), there are cash flow ratios that measure the company's ability to meet its short-term commitments and ratios aimed at evaluating the company's viability as a going concern. In their article titled "Power of cash flow ratios" they suggested the following list of the most useful cash flow ratios:

- Operating cash flow
- Funds flow coverage

- Cash interest coverage
- Cash current debt coverage
- Cash to capital expenditures
- Cash to total debt
- Total free cash
- Cash flow adequacy

The first four ratios are used to test a company's liquidity and solvency, and the rest of the ratios measure financial health of a company in the long term. We will evaluate selected U.S. airlines' financial health and liquidity using above mentioned cash flow ratios.

2.1. The use of Cash Flow Ratios to Evaluate Liquidity and Solvency

We will start our analysis by considering, first and foremost, cash flow ratios frequently used to gauge U.S. carriers' ability to meet their current commitments with cash provided by operating activities.

Operating cash flow ratio: The ratio is the relation between net cash flows generated from operating activities and the company's current liabilities. It indicates the extent to which the company is able to meet its current liabilities (Mills and Yamamura, 1998). The operating cash flow ratio for U.S. Airlines will be as follows:

Table 1: Operating cash flow ratio for U.S. airlines 2007-2011

U.S. Airlines Operating Cash flow ratio					
	2007	2008	2009	2010	2011
American Airlines, Inc.	0.16	(0.15)	0.06	0.09	0.06
Delta Airlines, Inc.	0.21	(0.15)	0.14	0.25	0.22
United Airlines, Inc	0.27	(0.16)	0.15	0.23	0.20
Continental Airlines, Inc	0.25	(0.07)	0.08	0.29	0.21
US Airways, Inc.	0.12	(0.26)	0.10	0.24	0.12
Southwest Airlines Co.	0.59	(0.54)	0.37	0.47	0.31
JetBlue Airways Corp.	0.29	(0.02)	0.42	0.48	0.43

Source: own calculations

The table above clearly shows that the selected U.S. carriers have had difficulties generating sufficient cash flows to cover their current liabilities. As we can notice, low-cost carriers such as Southwest and JetBlue have significantly higher value of operating cash flow ratio as opposed to legacy carriers which can be explained by the fact that low-cost carriers have relatively smaller total current liabilities and can cover a larger part of their current liabilities with cash from operations. Moreover, Southwest Airlines Co. being the largest low-cost carrier in the United States even competes with legacy carriers in terms of cash flows from operating activities. 2008 was a year of economic downturn followed by decreased demand for air travel and record high jet fuel prices (mid-2008) which negatively affected the operations and financial conditions of U.S. carriers (Federal Aviation Administration, 2011). As a result, all of the above mentioned airlines ended the year 2008 reporting negative net cash flows from operations. In general, capital-intensive industries including U.S.

airline industry normally generate moderate cash flows compared to non capital-intensive industries.

Funds flow coverage ratio (FFC): John R. Mills and Jeanne H. Yamamura (1998) propose this ratio as one that measures whether the company is able to pay off its unavoidable obligations such as interest, debt repayments and preferred dividends if any. Therefore, the ratio is a relation between earnings before interest, taxes, depreciation and amortization and so-called unavoidable expenditures (interest, tax-adjusted debt payments and tax-adjusted preferred dividends). EBITDA is considered as the closest component to cash flows from operations. Thus, the formula to compute funds flow coverage ratio is as follows:

$$FFC = \text{EBITDA} / (\text{Interest} + \text{Tax-adjusted debt repayment} + \text{Tax-adjusted preferred dividends})$$

It is highly important to note that in order to adjust for taxes, we need to divide debt repayment or preferred dividends by (1-effective income tax rate). The rule of thumb for FFC is that it should be at least 1, and the value below one indicates that the company is not able to fully cover unavoidable expenditures and will need to raise more funds in order not to default on those obligations.

For U.S. airlines the results are the following:

Table 2: Funds flow coverage ratio for U.S. airlines 2007-2008

U.S. Airlines Funds Flow Coverage Ratio					
	2007	2008	2009	2010	2011
American Airlines, Inc.	0.62	(0.87)	(0.09)	0.70	(0.08)
Delta Airlines, Inc.	0.45	(3.01)	0.32	0.77	0.69
United Airlines, Inc	0.33	(2.59)	0.56	0.73	0.82
Continental Airlines, Inc	1.19	0.12	0.37	0.83	1.24
US Airways, Inc.	3.16	(3.50)	0.70	1.23	0.78
Southwest Airlines Co.	5.12	5.64	0.78	3.54	1.07
JetBlue Airways Corp.	0.36	0.38	0.77	0.67	0.91

Source: own calculations

The results of the calculation of FFC ratio for U.S. carriers show that for the most part, U.S. airlines, especially legacy carriers have had difficulties generating EBITDA that covers unavoidable expenditures. The same cannot be said about Southwest Airlines which has had the value of FFC significantly above 1 except 2009. This can be explained by the fact that Southwest Airlines has substantially less debt obligations which implies less debt repayments as compared to legacy carriers and has been able to generate significantly high earnings before interest, taxes, amortization and depreciation to cover unavoidable expenses in recent years. American Airlines has the most conspicuous liquidity problems which reported negative EBITDA in 2008, 2009 and 2011. As a result, being unable to meet its short

and long-term commitments, the company filed for bankruptcy protection under Chapter 11 in November 2011 (AMR Corporation Form 10-K, 2011).

Cash interest coverage ratio (CIC): This ratio aims to measure the extent to which the company is able to pay off its interest obligations on all debt using cash flows from operations. Therefore, we compute cash interest coverage ratio dividing cash flows from operating activities, to which we also add back interest paid and taxes paid, by interest paid during the period. (Mills and Yamamura, 1998)

$$\text{CIC} = (\text{Cash flows from operations} + \text{Interest paid} + \text{Taxes paid}) / \text{Interest paid}$$

Highly leveraged companies such as most of the U.S. air carriers normally end up having relatively low cash interest coverage ratio in that their interest payments are higher than those of more balanced companies in terms of leverage: For U.S. airlines we have the following values of cash interest coverage ratio:

Table 3: Cash interest coverage ratio for U.S. airlines 2007-2011

U.S. Airlines Cash Interest Coverage Ratio					
	2007	2008	2009	2010	2011
American Airlines, Inc.	2.88	(1.64)	2.20	2.62	2.11
Delta Airlines, Inc.	3.24	(1.30)	2.59	3.73	4.06
United Airlines, Inc.	4.48	(1.96)	3.35	4.64	3.87
Continental Airlines, Inc.	3.96	0.13	2.11	5.36	3.75
US Airways, Inc.	4.58	(7.27)	3.25	6.01	3.99
Southwest Airlines Co.	47.65	(13.50)	7.51	14.59	8.56
JetBlue Airways Corp.	3.05	0.90	4.40	4.80	5.51

Source: own calculations

The table above tells us that during the above mentioned time span except 2008 both U.S. legacy and low-cost carriers were able to easily cover their interest expense with cash flows generated from operating activities. Moreover, 2008 was a year of downturn in the U.S. economy resulted from problems in the housing sector in the United States, and consequently, many of U.S. airlines except Continental Airlines and JetBlue Airways reported negative cash flows provided by operating activities in 2008. Southwest Airlines has the highest cash interest coverage ratio simply because it has significantly less interest expenditures.

Cash current debt coverage ratio: The final ratio that measures liquidity is the cash current debt coverage ratio that shows the company's ability to pay off its current debt with cash generated by operating activities after paying out cash dividends. In order to calculate this ratio we do not necessarily have to take all current liabilities but only liabilities that mature within the next 12 months. For U.S. airlines, those liabilities are short-term borrowings and current maturities of long-term debt and capital lease obligations. Thus, the ratio is a relation between the company's cash flows from operations less cash dividends and its current debt (Mills and Yamamura,

1998). The higher the value of this ratio, the more solvent the company is considered to be.

For U.S. airlines cash current debt ratio will be as illustrated in the following table below:

Table 4: Cash current debt coverage ratio for U.S. airlines 2007-2011

U.S. Airlines Cash Current Debt Coverage Ratio					
	2007	2008	2009	2010	2011
American Airlines, Inc.	2.88	(1.14)	0.73	0.67	0.46
Delta Airlines, Inc.	1.34	(1.47)	0.90	1.37	1.46
United Airlines, Inc.	2.29	(1.56)	1.01	1.00	1.92
Continental Airlines, Inc.	1.74	(0.62)	0.37	1.61	1.72
US Airways, Inc.	4.29	(2.96)	0.78	2.15	1.05
Southwest Airlines Co.	69.05	(9.41)	5.12	3.07	2.13
JetBlue Airways Corp.	0.86	(0.11)	1.27	2.86	3.10

Source: own calculations

According to the results illustrated in the table above, for the most part, U.S. airlines have been able to cover their current maturities of long-term debt and capital lease obligations with cash from operations. In particular, Southwest Airlines has the highest value of cash current debt coverage ratio inasmuch as it has relatively small current debt maturing within a year whereas American Airlines has had a ratio below 1 not being able to fully cover current debt maturities for three consecutive years. In sum, in terms of operating cash flow and funds flow coverage ratios, U.S. airlines have liquidity problems and need more funds in addition to cash from operations to cover their current liabilities or unavoidable expenditures whereas they, for the most part, can meet interest, debt and capital lease obligations with cash from operations. Having used cash flow ratios to analyze the company's liquidity and solvency, that is, its ability to meet its current commitments with cash flows provided by operations, now we can proceed to cash flow ratios via which the analysts, auditors and investors examine the company as a going concern. The term "going concern" means whether the company is able to settle its long-term financial and operational obligations, how willingly it can finance growth in the long term (Mills and Yamamura, 1998).

2.2. The use of Cash Flow Ratios to Evaluate the Company as Going Concern

John R. Mills and Jeanne H. Yamamura (1998) in their article titled "The power of cash flow ratios" proposed the following cash flow ratios that are frequently used to measure the financial health of the company.

Cash to capital expenditure ratio: The ratio is a relationship between cash from operations and capital expenditures made during the period. John R. Mills and Jeanne H. Yamamura (1998) state that this ratio helps to find out whether the company has sufficient funds to reinvest for the future growth and, moreover, whether it is able to pay off its current and long-term debt with remaining cash.

Therefore, by computing this ratio the analysts put an emphasis on the company's financial health and its ability to finance growth. In fact, growing industries normally tend to have lower value of the cash to capital expenditure ratio because growth requires a significant amount of capital expenditures (Mills and Yamamura, 1998). For U.S. airlines cash to capital expenditure ratio will be as follows:

Table 5: Cash to capital expenditure ratio for U.S. airlines 2007-2011

U.S. Airlines Cash to Capital Expenditure Ratio					
	2007	2008	2009	2010	2011
American Airlines, Inc.	2.28	(1.88)	0.44	0.65	0.49
Delta Airlines, Inc.	1.31	(1.12)	1.15	2.11	2.26
United Airlines, Inc.	2.94	(2.57)	3.09	5.65	3.06
Continental Airlines, Inc.	3.44	(0.87)	0.95	4.67	4.19
US Airways, Inc.	0.77	(0.98)	0.48	4.39	0.76
Southwest Airlines Co.	2.14	(1.65)	1.68	3.17	1.38
JetBlue Airways, Corp.	0.58	(0.03)	1.12	2.10	1.28

Source: own calculations

In order to be competitive major U.S. airlines adopt growth strategy that implies significant capital expenditures. Moreover, the airline industry which is characterized as being cyclical may have a frequently changeable value of cash to capital expenditure ratio, and since the airline industry itself is capital intensive, the ratio may be low. The table above shows us that the value of the ratio is quite changeable. Delta Airlines, Southwest Airlines, United Airlines, JetBlue Airlines, Continental Airlines for three successive years have generated enough cash from operations to finance capital investments and even use the rest to meet their long-term debt obligations. Negative values for this ratio in 2008 can be simply explained by negative cash flows from operations that U.S. airlines reported as a result of the economic downturn. US Airways significantly improved cash to capital expenditure ratio which dropped again below 1 in 2011. Unlike the rest of the carriers being discussed, for three successive years American Airlines has had the worst results for the ratio which has not been able to generate sufficient cash to make capital investments and reinvest the rest for future growth.

Cash to total debt ratio (C/TD): The ratio compares the company's cash flows provided by operating activities to total liabilities. This ratio is deemed to be very useful and important, in particular for credit-rating agencies, credit specialists and so on, because it measures the company's ability to meet its future commitments. The companies with low cash flow to total debt ratio are more likely to face financial problems in the future (Mills and Yamamura, 1998). The formula is as follows:

$$C/TD = \text{Cash flow from operations} / \text{Total debt}$$

U.S. airlines have the following values of C/TD ratio presented in the table below.

Table 6: Cash to total debt ratio for U.S. airlines 2007-2011

U.S Airlines Cash to Total Debt Ratio					
	2007	2008	2009	2010	2011
American Airlines, Inc.	0.07	(0.06)	0.02	0.04	0.02
Delta Airlines, Inc.	0.07	(0.04)	0.04	0.08	0.07
United Airlines, Inc	0.12	(0.07)	0.06	0.10	0.09
U.S Airlines Cash to Total Debt Ratio					
	2007	2008	2009	2010	2011
Continental Airlines, Inc	0.11	(0.03)	0.03	0.10	0.07
US Airways, Inc.	0.08	(0.15)	0.05	0.13	0.06
Southwest Airlines Co.	0.29	(0.17)	0.11	0.17	0.13
JetBlue Airways Corp.	0.08	(0.004)	0.10	0.11	0.12

Source: own calculations

Total free cash ratio (TFC): In recent years analysts and investors have begun to focus on the concept of free cash flow, because it is more reliable as a measure of the company's financial health and cannot be readily manipulated as opposed to earnings which we have discussed earlier. The term "free cash flow" has not been well defined yet. The conventional definition is that free cash flow equals cash flow from operation less capital expenditures and results in the amount what remains for paying off short and long-term debt and cash dividends after tying up funds in plant and equipment (Friedlob and Schleifer, 2003). Since there is no standardized definition for free cash flow, John R. Mills and Jeanne H. Yamamura (1998) suggested so-called total free cash ratio that measures the company's ability to meet its future cash obligations. In addition, the total free cash flow takes off-balance sheet items into consideration such as operating lease. Therefore, the ratio contains rental expense under operating lease and current maturities of operating lease obligations. The formula of the total free cash flow ratio and the results for U.S. airlines are presented below.

$$\text{(Net income + Accrued and capitalized interest expense + Depreciation and amortization + Operating lease and rental expense - Declared dividends - Capital expenditures)}$$

$$\text{TFC} = \frac{\text{(Accrued and capitalized interest expense + Operating lease and rental expense + Current portion of long-term debt + Current portion of capitalized lease obligations)}}{\text{Total Debt}}$$

The results for U.S. carriers are summarized in the following table:

Table 7: Total free cash flow ratio for U.S. airlines 2007-2011

U.S. Airlines Total Free Cash Flow Ratio					
	2007	2008	2009	2010	2011
American Airlines, Inc.	0.76	(0.11)	(0.02)	0.19	(0.02)
Delta Airlines, Inc.	0.86	(1.77)	0.30	0.54	0.59
United Airlines, Inc	0.61	(0.76)	0.44	0.59	0.66
Continental Airlines, Inc	0.60	0.36	0.40	0.54	0.70
US Airways, Inc.	0.60	(0.48)	0.32	0.76	0.45
Southwest Airlines Co.	0.46	0.43	0.65	0.82	0.40
JetBlue Airways Corp.	0.07	0.01	0.29	0.61	0.36

Source: own calculations

The results shown in the table tell us that U.S. airlines after making capital expenditures do not generate sufficient free cash to meet their future obligations such as interest payments, operating lease payments, the repayment of long-term debt and capital lease obligations and will need more external funds in the long-term. *Cash flow adequacy ratio (CFA)*: Cash flow adequacy ratio is one of the most useful ratios in the cash flow analysis that evaluates the company's capability to meet its continuous financial commitments and is the basic measure of cash sufficiency. John R. Mills and Jeanne H. Yamamura (1998) proposed their version of cash flow adequacy ratio that measures the company's credit quality. The formula starts with EBITDA less taxes paid, interest paid and capital expenditures which is then compared to the average of annual debt maturities scheduled over the next five years. Thus, the formula will be as follows:

$$CFA = \frac{(\text{EBITDA} - \text{Taxes paid} - \text{Interest paid} - \text{Capital expenditures})}{\text{Average annual debt maturities scheduled over the next 5 years}}$$

The higher the ratio, the more creditworthy the company is which means that it generates more free cash to pay off annual maturities of long-term debt (Mills and Yamamura, 1998).

For U.S. Airlines the cash flow adequacy ratio suggested by John R. Mills and Jeanne H. Yamamura (1998) will be as illustrated in the table below:

Table 8: Cash flow adequacy ratio for U.S. Airlines

U.S. Airlines Cash flow adequacy ratio					
	2007	2008	2009	2010	2011
American Airlines, Inc.	0.23	(2.30)	(1.96)	(1.05)	(1.75)
Delta Airlines, Inc.	0.58	(4.16)	(0.36)	0.71	0.89

United Airlines, Inc	0.86	(6.60)	0.07	1.03	0.99
Continental Airlines, Inc	0.60	(0.87)	(0.49)	0.77	1.31
US Airways, Inc.	0.26	(7.00)	(1.01)	1.57	(0.11)
Southwest Airlines Co.	(1.31)	(0.14)	0.39	2.11	0.40
JetBlue Airways Corp.	(1.94)	(1.28)	(0.14)	0.39	(0.13)

Source: own calculations

According to the table above, in 2008 and 2009 the U.S. Airlines had negative and very low values of cash flow adequacy ratio which resulted from high operating expenses including continuously rising fuel cost and crisis-related decreased demand for air travel. However, during the post-economic crisis period, many of them significantly improved their positions in regard to cash sufficiency except American Airlines that reported negative free cash flow in recent years.

Thus we have discussed frequently used cash flow ratios that evaluate the company's liquidity and financial health in the long term.

3. Conclusion

The cash flow analysis conducted for major U.S. airlines shows that they have liquidity problems. If we separately consider U.S. carriers' ability to cover interest obligations or current maturities of long-term debt and capital lease obligations, then they are capable to cover them with cash from operating activities although they have difficulties generating cash to fully cover unavoidable expenditures or current liabilities. On the other hand, the computation of cash flow ratios such as cash adequacy ratio, cash to total debt ratio and total free cash ratio that evaluate the company's viability as a going concern indicates that U.S. airlines are likely to face financial difficulties when it comes to meeting future ongoing operational and financial commitments.

U.S. airline industry is highly subject to unsteadiness, seasonality and economic slumps. Difficulties in generating sufficient cash flow result from slowly growing demand for air travel, increasing operating expenses mainly driven by continuously rising fuel prices and high labor costs. Especially U.S. airlines' financial condition and operations were highly affected by recent economic crisis that began in late 2007 in the United States.

Interestingly, the results of cash flow analysis show us that low-cost carriers, Southwest Airlines in particular, have liquidity problems to a much lesser degree than U.S. legacy carriers. One of the explanations is that low-cost carriers have relatively less debt and capital lease obligations than legacy carriers do which are highly leveraged. Moreover, in the past few years, especially through 2008, a year of economic crisis, low-cost carriers have engaged in hedge activities for fuel to a larger extent than legacy carriers have and have experienced moderate increase in fuel prices significantly avoiding their adverse effects on operating profits.

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