# USING ACCOUNTING INFORMATION TO VALUE A BUSINESS – A CASE STUDY FOR THE MBA FINANCIAL ACCOUNTING COURSE

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## CASE DESCRIPTION

*The primary purpose of this case is to illustrate how financial accounting information can be used by potential purchasers of an existing business to develop a bid to purchase the business shown in the case. Secondary issues include the use of Excel for present value calculations such as calculating internal rate of return and differential use of operating cash flow and accrual accounting information for valuation purposes. The case has a difficulty level of five, appropriate for first year graduate students. The case has been designed to be used in a Financial Accounting course within an MBA program. Additionally, the case could be used in a junior or senior level finance or accounting class where students have the appropriate knowledge of financial statements and present value analysis. The case can be taught in 1-2 hours with no outside preparation by students as long as students have had exposure to present value concepts and financial accounting ratios.*

## CASE SYNOPSIS

*In this case, students play the role of investors seeking to buy a fictitious company (USD Motors) that has prior financial statements available. Students forecast future income and operating cash flows for USD Motors and use this information to create a bid to buy the Company. Students learn how to use Excel to compute the present value of future net incomes and future operating cash flows as part of the process of putting together a bid. Students will discover how past accounting information can be used to make an important business decision. Students will compare their bid to benchmark data for Price to Earnings Ratio and Market to Book Value Ratio to make sure that their bid is reasonable. Students will prepare "sealed bids" that will be submitted to the course instructor toward the end of a class session. The highest bidding group will be the new "owner" of USD Motors.*

## THE SITUATION

The purpose of this case is to allow students the opportunity to see how financial accounting information can be used to determine how much to offer when attempting to buy an existing business. You will be put in a group so that you, and the others in your group, can

develop an understanding of how accounting information can be useful in making a business decision.

Specifically, each student group will independently calculate what the group is willing to bid to purchase a fictitious company (USD Motors). In this case, you are provided with income statements for USD Motors for the most recent four years as well as the Company's most recent balance sheet (see below). Each group will use this past financial statement information to try to develop a reasonable price to bid for USD Motors. Groups will develop bids by using the following three-step process:

Step 1: Make forecast (a best estimate) of what they think USD Motors' earnings will be over the next 20 years.
Step 2: Determine the present value of USD Motors' forecasted future earnings (and the present value of its expected operating cash flows).
Step 3: Adjust these present value figures for the current cash and liability position of the Company.

After the student groups complete the above process (using three recommended approaches discussed below) each group will need to discuss their analysis and will need to judgmentally decide on a bid to try to acquire the existing business. Toward the end of the class session, each group will submit to their professor (on a piece of paper) a "sealed" bid to purchase USD Motors. The professor will write on the board the bid for each group and the highest bidding group will be the new "owner" of USD Motors. To conclude the class session, the class will examine the reasonableness of the highest winning bid in the light of the current Price to Earnings Ratio and Market to Book Value Ratio of the "average" company in the United States.

To aid each group in its decision-making process, the most recent four years of income statements for USD Motors are provided (see Table 1 below). Additionally, information concerning financial transactions that occurred during the first four years of operating activity for USD Motors is provided (see Table 2 below). These transactions show that on January 1, Year 1, USD Motors issued 140,000,000 shares of common stock for $140,000,000. The financial records also reveal that USD Motors bought an auto plant for $140,000,000 on January 1, Year 1. Note that the bottom row in Table 2 shows the balance sheet for USD Motors as of December 31, Year 4 which indicates that the book value (stockholders' equity) of USD Motors is $236,000,000 as of December 31, Year 4.

**Table 1**
USD Motors Income Statements
For the Years Ended December 31, Years 1-4

| | Year 1 | Year 2 | Year 3 | Year 4 | Totals |
|---|---|---|---|---|---|
| Sales (all received in cash) | 80,000,000 | 90,000,000 | 100,000,000 | 110,000,000 | 380,000,000 |
| Expenses (all paid in cash) | -60,000,000 | -65,000,000 | -70,000,000 | -75,000,000 | -270,000,000 |
| Depreciation Expense | -3,500,000 | -3,500,000 | -3,500,000 | -3,500,000 | -14,000,000 |
| Net Income | 16,500,000 | 21,500,000 | 26,500,000 | 31,500,000 | 96,000,000 |

**Table 2**
USD Motors Financial Transactions
For the 4 Years Ended December 31, Year 4

| Transactions | Cash | Property, Plant, and Equipment (net) | Common Stock | Retained Earnings |
|---|---|---|---|---|
| Initial Public Offering | 140,000,000 | | 140,000,000 | |
| Buy Property, Plant and Equipment | -140,000,000 | 140,000,000 | | |
| Sales (4 Years) | 380,000,000 | | | 380,000,000 |
| Various Expenses (4 Years) | -270,000,000 | | | -270,000,000 |
| Depreciation Expense | | -14,000,000 | | -14,000,000 |
| **Balances 12/31/Year 4** | **110,000,000** | **126,000,000** | **140,000,000** | **96,000,000** |
| **Total Assets & Stockholders' Equity** | | **236,000,000** | **236,000,000** | |

With this financial statement information, you will be able to make forecasts of the expected future incomes (or operating cash flows) of USD Motors over the next 20 years. For the purposes of this case, it is suggested using 20 years as the time period to use when student groups discount all the forecasted future net incomes (or operating cash flows) back to present value since the incremental present value of adding additional years (beyond 20 years) in a forecast would have little impact on the bid, as the present value factors for years greater than 20 years are very low.

As discussed below, it is suggested that groups use several approaches in developing a bid. By using different approaches, each group will in effect create several bids and each group will discuss within the group which "sealed" bid to submit to their professor near the end of this case exercise.

## FIRST APPROACH – PRESENT VALUE THE SIMPLE AVERAGE OF FUTURE EARNINGS

With your first approach, we suggest the simplifying assumption that the net income each year would increase by a constant dollar amount each year over the next 20 years such that you can compute an average annual net income for USD Motors over the next 20 years. The average annual net income would be the Year 5 Net Income plus the Year 24 Net Income all divided by 2. This average Net Income value is then present valued by using a present value of ordinary annuity table.

The most recent earnings for USD Motors (for the year ended December 31, Year 4) was $31,500,000 and earnings have been increasing each year since Year 1. Each student group will take the income statement information from the previous four years to estimate the overall average net income for the next 20 years. Making this simplifying assumption allows the student groups to present value a single average earnings figure using present value of ordinary annuity tables. An annuity is a stream of payments that are equal in amount for each month/quarter/year etc. that is under examination. Students will need to multiply the annuity amount by the present value factor of an ordinary annuity (with an ordinary annuity it is assumed that the annuity payment will be made at the end of each month/quarter/year etc.).

To determine the present value factor for an ordinary annuity when the time period is 20 years, each student group will need to select an interest rate to discount the forecasted future net incomes in order to compute a present value of an ordinary annuity figure. If the risk of USD Motors is perceived to be low, the interest rate selected for present value purposes will also be low. Using a low interest rate will mean (other things being equal) that the bid will be higher as there is an inverse relationship between interest rates and present values. On the other hand, if the risk of USD Motors is perceived to be high, then a higher interest rate will be used for present value purposes. Using a high interest rate (other things being equal) will result in a lower bid given the inverse relationship between interest rates and present values. In other words, there is a logical trade-off that lower bids will come from student groups that forecast lower future earnings and/or that perceive higher risk associated with future returns.

Once you estimate a present value for these estimated future earnings, you will need to add the current Dec. 31, Year 4 cash balance of USD Motors (see Table 2 to find this balance) to determine your first bid. Note: Since USD Motors does not have any liabilities (as of Dec. 31, Year 4), there is no need to subtract existing Company liabilities when determining a bid.

## SECOND APPROACH – PRESENT VALUE THE INDIVIDUAL FUTURE YEAR ESTIMATED EARNINGS

With this second approach, we suggest that students try to estimate the forecasted earnings for each year individually (for the next 20 years) and to calculate the present value of these earnings using Excel. Since yearly expected earnings will not all be the same, student groups will not be able to use ordinary annuity present value tables. However, students can use

Excel to present value each year's earnings separately and then provide a total present value amount.

Once the student groups have calculated the total present value for these estimated future earnings, they will need to add the current cash balance of USD Motors (as was done with the first approach) to the present value of estimated future earnings to develop a second potential bid.

If let's say that the estimated future earnings for USD Motors are listed in Column B (Rows 4-23) in an Excel Spreadsheet and assuming that a group decides on a 16% interest (i.e., discount) rate, here is the Excel formula for estimating the present value of future expected earnings:

=NPV(16%,B4:B23)

## THIRD APPROACH – PRESENT VALUE OF YEARLY ESTIMATED OPERATING CASH FLOWS

For this third approach, we will consider the fact that investors are oftentimes more interested in operating cash flows (and less interested in accrual accounting earnings) when they try to establish a value for a business. Specifically, for this third approach students will estimate the future operating cash flows for USD Motors (for the next 20 years). To approximate forecasted operating cash flows, we suggest adding back depreciation expense to forecasted future earnings. Depreciation expense is added back to forecasted earnings because depreciation expense reduces accrual-based net income but is not an operating cash flow. It should be noted that Depreciation Expense for USD Motors was $14 million (per Table 2) for the 4-year period ending December 31, Year 4. Thus, USD Motors can be said to have incurred $3.5 million in annual depreciation expense (assuming the use of straight-line depreciation by USD Motors for financial reporting purposes) and this $3.5 million in depreciation expense each year needs to be added to the expected earnings each year (for the next 20 years) that was used with the second approach noted above.

Let's say that the estimated future earnings for USD Motors are listed in Column B (Rows 4-23) in an Excel spreadsheet and Column D shows the estimated future operating cash flows (after adding back the depreciation expense from Column C). Using the information in Column D, here is the Excel formula for estimating the present value of future operating cash flows--again using a 16% interest rate: =NPV(16%,D4:D23)

## TEST THE REASONABLENESS OF YOUR BID

As part of the process of judgmentally determining a bid, each group should consider the reasonableness of their bid using some critical accounting ratios. It is suggested that you compute two accounting ratios for USD Motors and compare these ratios to benchmark data created by Reuters (or similar organizations). It is suggested that you compute the Price to Earnings Ratio and Market to Book Value Ratio for USD Motors, using your bid to establish a

Fair Market Value figure. Tables 1 and 2 provide the additional data needed to compute these ratios for USD Motors.

The P/E Ratio is determined by dividing the fair market value per share by the earnings per share. The total fair market value for USD Motors would be your group's bid. Taking the bid and dividing by USD Motors' 140 million outstanding shares of common stock (as of December 31, Year 4) would yield the Company's fair market value per share. Earnings per share is determined by dividing USD Motors' Year 4 net income (see Table 1) by the 140 million outstanding shares of common stock.

The Market to Book Value Ratio for USD Motors is determined by dividing the Company's overall valuation (based on your bid for USD Motors) divided by the Company's total stockholders' equity as of December 31, Year 4. The Company's total stockholders' equity can be found in Table 2.

## TASK

Your instructor will likely provide additional, specific questions to speed you along the way to determining what your group's purchase bid will be.