

# **A MODEL FOR FORECASTING SMALL BUSINESS FINANCIAL STATEMENTS AND FIRM PERFORMANCE**

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## **ABSTRACT**

*Forecasting financial statements and completing comprehensive financial analysis constitutes a considerable challenge for entrepreneurs. Students in various entrepreneurship, finance and accounting courses also face this challenge. This paper presents a spreadsheet template that assists entrepreneurs and students with this task. The template creates forecasted financial statements, a capital budget, calculations of firm value and ratio analysis. The template addresses specific considerations of start-up firms. The template provides flexibility that allows adaptations to various entrepreneurs and to meet learning objectives of courses at varying levels.*

**JEL:** A2, G31, M13, M41

**KEYWORDS:** Financial Statements; Pro-Forma Financial Statements, Forecasting, Entrepreneurship, Small Business Finance, Accounting for Small Businesses

## **INTRODUCTION**

**C**reating pro-forma financial statements and comprehensive financial analysis represents a considerable challenge for users including entrepreneurs and students. Users commonly become overwhelmed by the volume of computations required to complete the analysis. Moreover, users frequently experience difficulty in correctly linking elements of the analysis together to produce balanced financial statements and meaningful financial analysis.

This paper provides a template for financial statement forecasting and completing financial analysis for a firm. The template produces forecasted financial statements, capital budgeting analysis, estimates of firm value and ratio analysis which compares the firm to others in the same industry. The financial statements have internal consistency and do not require plug variables to balance. The analysis also does not create circular references. Thus, the financial statements avoid problems associated with plug variables and circular references noted by other authors.

The template includes features that specifically address concerns of start-up firms. Simple modifications allow the tool to accommodate needs of entrepreneurs and professors from various business disciplines. The tool, as presented here, includes a high degree of automation. Users must enter only managerial decision variables. The template calculates the remaining variables. This fully automated version best meets the need of entrepreneurs. The rigor of work required of students can be adjusted by modifying the level of template automation. The template provides an annual analysis of the firm for each of the first five years of operation.

The remainder of the paper is organized as follows. The next section provides a brief literature review. The following section provides a discussion of some assumptions made to create the template. Next, the

template is introduced and discussed. The paper presents templates displaying sample calculations and the underlying formulae. The paper closes with some concluding comments and suggestions for further research.

## LITERATURE REVIEW

A relatively small body of academic work addresses financial statement forecasting. However, some patents exist concerning methods to complete financial analysis. Erwin, Fortheringham and McGuinness (1998), U.S. Patent US6249770, provides a method for forecasting financial statements based on historical data of the firm. This method examines information including inflation adjustments, exchange rates and historical account data for the company to develop forecasted financial statements and analysis. Paquette (2000), U.S. Patent US6850897, develops an algorithm for analyzing the use of profitability within an organization. The algorithm computes the relationship between profitability and several financial variables. They use these calculations to develop a total profitability ratio. Other patents, and patent applications, exist that involve forecasting financial statements and other related issues (Chopra, Masih, Chugh, Bidkar and Navani, 2015).

Some academic research also examines forecasting financial statements based on historical data. Kerry (2010) develops a system for financial statement forecasting that requires the input of financial statements of a given firm, that of other firms, macroeconomic data and user forecasts of specific account items. Vélez-Pareja, I. and J. Tham (2008) and Vélez-Pareja (2011) discuss financial statement forecasting based on historical data. They develop a complex system to forecast that does not require plug figures to balance the financial statements. Arnold (2011) also develops pro-forma financial statements with a focus on plug figures. He demonstrates the link between two common plug figures used, common stock and long-term debt.

Jalbert, Briley and Jalbert (2012) present a method to forecast financial statements based on Risk Management Associates data. Risk Management Associates data provides summary historical data based on averages within an industry and geographic area. They suggest their method offers an alternative to the percentage of sales method and can be more easily defended to skeptical bankers.

Drougas and Johnson (2004) utilize statistical techniques to forecast financial statements to facilitate learning by undergraduate students. The model simulates an income statement and demonstrates how uncertainty in forecasts affects the outcome. They then extend the analysis to forecast the balance sheet and free cash flows. Alzubaidi (2014) utilizes Visual Basic Code within Microsoft Excel to customize spreadsheets for different financial analysis purposes.

Desanctis and Jarvenpaa (1989) examine three reporting methods for forecasting financial statements. They examine graphical formats, numerical formats and a mix of the two. Their results show that graphical formats improve the accuracy of forecast judgements.

Cheremushkin (2010) presents a system for forecasting financial statements that focuses on the use of retained earnings within the firm. Specifically, they identify relationships between capital expenditures, sales and operating margins. Vélez-Pareja (2010) examines the role of risky tax shields and risky debt in creating pro-forma financial statements.

Vorkink, K. and K. Workman (2016) focus on estimating sales and sales growth in developing their forecasting method. They suggest a four-step process to estimate sales that involves 1.) constructing historical averages, 2.) adjust those averages for macroeconomic factors, 3.) adjust for industry factors and 4.) adjust for company specific factors.

The research here extends these bodies of literature. The template presented here specifically focusses on issues commonly faced by small businesses. These issues include Section 179 expense election and other immediate expensing options as well as non-expensed owner contributions to the firm.

## **ASSUMPTIONS**

As with any financial analysis, the technique here requires certain assumptions. This section outlines assumptions incorporated into the template. The methodology assumes the business purchases capital equipment, expensed using standard depreciation tools, at the outset of the project only. To limit the complexity of the financial statements, users may select from four depreciation methods, 1.) 3-year MACRS, 2.) 5-Year Straight Line, 3.) 5-year MACRS, and 4.) 39-Year Straight Line. Immediate expensing using Section 179 expense election, or other immediate expensing options applies to purchase made after the initial investment.

The analysis assumes that cost of goods sold (COGS), as a percentage of sales, remains constant throughout the analysis. Users who require time-varying cost of goods sold can adjust this amount by overriding the calculated amount and directly entering a cost of goods sold amount. Overriding this figure does not affect calculations throughout the remainder of the spreadsheet. The capital budget utilizes a five-year framework. At the end of the fifth year of operations, all assets are sold. The template assumes full payment of all liabilities. The methodology discounts pre-interest cash flows at the weighted average cost of capital (WACC).

## **FINANCIAL FORECASTING TEMPLATE**

This section presents the forecasting template. The forecasting tool calculates some variables and users input other variables. To denote the difference, some items are bolded, while others are plain text. Users enter items indicated in plain text. The spreadsheet calculates items in bold. The spreadsheet does not protect calculated cells. Thus, advanced users may adjust these items. Users should back up their work in the event they inadvertently change these cells, or change the cells and later discover that their skill level is not sufficient to address the necessary accompanying changes.

The presentation includes both a numeric example and the underlying formulae. Tables 1-6 present the template in numeric format. Following the numeric template, Tables 1F-6F present the corresponding underlying formulae. Some formulae were too large to present in the spreadsheet. In these cases, the indicator \* along with a number indicates presentation of the formulae in the table note.

The analysis begins with the entry of required input fields. Table 1 (Table 1F) shows necessary input variables and the income statement. Required inputs, exogenous to the model, include the average interest rate faced on loans, cost of equity, capital gains tax rate, ordinary income tax rate and corporate tax rate. While exogenous to the model, the template can accommodate additional analysis to determine these amounts. Users must simply perform the analysis and enter the resulting figures in the appropriate table cell.

The input section also includes COGS as a percentage of sales and the general excise tax rate. As noted earlier, COGS as a percentage of sales remains constant throughout the five years of analysis. Users must report their estimate of this percentage in the input section. Intermediate and advanced users may directly enter the cost of goods sold dollar amount to override this calculation. Per the spreadsheet design, overriding this figure does not affect the remaining calculations.

The spreadsheet includes a business tax called the General Excise Tax. This tax is framed after the Hawaii General Excise Tax. The tax is levied on businesses based on their sales. Many businesses chose to collect

the amount of this tax from customers. Regardless, the liability for the tax lies with the business. The tax rate here equals 4.167 percent, in line with Hawaii rates. Users can adjust the percentage. To accommodate businesses not facing this tax, the user simply sets the rate equal to zero percent.

Table 1: Input Variables and Income Statement

A	B	C	D	E	F	G	H
2	<b>INPUT VARIABLES</b>						
3							
4	Average Interest Rate on Loans	7.000%					
5	Cost of Equity	12.000%					
6	Tax Rate on Capital Gains (TPS)	15.000%					
7	Tax Rate on Ordinary Income (TPB)	20.000%					
8	Corporate Tax Rate (TC)	22.000%					
9	Cost of Goods Sold as a % of Sales	40.000%					
10	General Excise Tax Rate	4.167%					
	<b>INCOME STATEMENT</b>						
		<b>Yr 0</b>	<b>Yr 1</b>	<b>Yr 2</b>	<b>Yr 3</b>	<b>Yr 4</b>	<b>Yr 5</b>
15	Sales		300,000	325,000	295,000	300,000	600,000
16	Less General Excise Tax		<b>12,501</b>	<b>13,543</b>	<b>12,293</b>	<b>12,501</b>	<b>25,002</b>
17	Cost of Goods Sold		<b>120,000</b>	<b>130,000</b>	<b>118,000</b>	<b>120,000</b>	<b>240,000</b>
18	Labor		15,000	15,000	15,000	15,000	15,000
19	Employee Benefits		2,000	2,000	2,000	2,000	2,000
20	Utilities		5,000	5,000	5,000	5,000	5,000
21	Advertising		10,000	10,000	8,000	10,000	10,000
22	Rent		40,000	40,000	40,000	40,000	40,000
23	Expense 6		0	0	0	0	0
24	Expense 7		0	0	0	0	0
25	Current Year Section 179 Purchases		20,000	25,000	20,000	0	0
26	Depreciation MACRS 3YR		<b>9,900</b>	<b>13,500</b>	<b>4,500</b>	<b>2,100</b>	<b>0</b>
27	Depreciation SL 5YR		<b>8,000</b>	<b>8,000</b>	<b>8,000</b>	<b>8,000</b>	<b>8,000</b>
28	Depreciation MACRS 5YR		<b>12,000</b>	<b>19,200</b>	<b>11,400</b>	<b>7,200</b>	<b>6,600</b>
29	Depreciation SL 39 Year Real Estate		<b>2,564</b>	<b>2,564</b>	<b>2,564</b>	<b>2,564</b>	<b>2,564</b>
30	Total Expenses		<b>256,965</b>	<b>283,807</b>	<b>246,757</b>	<b>224,365</b>	<b>354,166</b>
31	EBIT		<b>43,035</b>	<b>41,193</b>	<b>48,243</b>	<b>75,635</b>	<b>245,834</b>
32	Interest		<b>8,400</b>	<b>11,550</b>	<b>8,750</b>	<b>10,850</b>	<b>8,400</b>
33	EBT		<b>34,635</b>	<b>29,643</b>	<b>39,493</b>	<b>64,785</b>	<b>237,434</b>
34	Tax		<b>5,195</b>	<b>4,446</b>	<b>5,924</b>	<b>9,718</b>	<b>35,615</b>
35	Net Income		<b>29,440</b>	<b>25,197</b>	<b>33,569</b>	<b>55,067</b>	<b>201,819</b>

*This table shows the input variables and income statement. The spreadsheet calculates items in bold. Users enter their own data for items not bolded.*

Table 1F: Input Variables and Income Statement (Formulae Display)

A	B	C	D	E	F	G	H
2	<b>INPUT VARIABLES</b>						
3							
4	Avg. Interest Rate on Loans	0.07					
5	Cost of Equity	0.12					
6	Tax Rate ON Capital Gains	0.15					
7	Tax Rate on Ordinary Income	0.2					
8	Corporate Tax Rate	0.22					
9	COGS as a % of Sales	0.4					
10	General Excise Tax Rate	0.04167					
	<b>INCOME STATEMENT</b>						
		<b>Yr 0</b>	<b>Yr 1</b>	<b>Yr 2</b>	<b>Yr 3</b>	<b>Yr 4</b>	<b>Yr 5</b>
15	Sales	300000	325000	295000	300000	600000	
16	Less General Excise Tax	<b>=D15*\$C\$10</b>	<b>=E15*\$C\$10</b>	<b>=F15*\$C\$10</b>	<b>=G15*\$C\$10</b>	<b>=H15*\$C\$10</b>	
17	Cost of Goods Sold	<b>=D15*\$C\$9</b>	<b>=E15*\$C\$9</b>	<b>=F15*\$C\$9</b>	<b>=G15*\$C\$9</b>	<b>=H15*\$C\$9</b>	
18	Labor	15000	15000	15000	15000	15000	
19	Employee Benefits	2000	2000	2000	2000	2000	
20	Utilities	5000	5000	5000	5000	5000	
21	Advertising	10000	10000	8000	10000	10000	
22	Rent	40000	40000	40000	40000	40000	
23	Expense 6	0	0	0	0	0	
24	Expense 7	0	0	0	0	0	
25	Cur. Yr. Sec. 179 Purchases	20000	25000	20000	0	0	
26	Depreciation MACRS 3YR	<b>=DP!E8</b>	<b>=DP!E9</b>	<b>=DP!E10</b>	<b>=DP!E11</b>	<b>=DP!E12</b>	
27	Depreciation SL 5YR	<b>=DP!J8</b>	<b>=DP!J9</b>	<b>=DP!J10</b>	<b>=DP!J11</b>	<b>=DP!J12</b>	
28	Depreciation MACRS 5YR	<b>=DP!O8</b>	<b>=DP!O9</b>	<b>=DP!O10</b>	<b>=DP!O11</b>	<b>=DP!O12</b>	
29	Depreciation SL 39 Year	<b>=DP!T8</b>	<b>=DP!T9</b>	<b>=DP!T10</b>	<b>=DP!T11</b>	<b>=DP!T12</b>	
30	Total Expenses	<b>=D16:D29</b>	<b>=E16:E29</b>	<b>=F16:F29</b>	<b>=G16:G29</b>	<b>=H16:H29</b>	
31	EBIT	<b>=D15-D30</b>	<b>=E15-E30</b>	<b>=F15-F30</b>	<b>=G15-G30</b>	<b>=H15-H30</b>	
32	Interest	<b>*1</b>	<b>*2</b>	<b>*3</b>	<b>*4</b>	<b>*5</b>	
33	EBT	<b>=D31-D32</b>	<b>=E31-E32</b>	<b>=F31-F32</b>	<b>=G31-G32</b>	<b>=H31-H32</b>	
34	Tax	<b>=D33*\$C\$6</b>	<b>=E33*\$C\$6</b>	<b>=F33*\$C\$6</b>	<b>=G33*\$C\$6</b>	<b>=H33*\$C\$6</b>	
35	Net Income	<b>=D33-D34</b>	<b>=E33-E34</b>	<b>=F33-F34</b>	<b>=G33-G34</b>	<b>=H33-H34</b>	

*This table shows formulae for the input variables and income statement. Worksheet 'S1' contains all calculations except depreciation. Worksheet 'DP' contains depreciation computations. \*1 = (C102+C103+C110)\*\$C\$4, \*2 = (D102+D103+D110)\*\$C\$4, \*3 = (E102+E103+E110)\*\$C\$4, \*4 = (F102+F103+F110)\*\$C\$4, \*5 = (G102+G103+G110)\*\$C\$4. The spreadsheet calculates bolded items. Users enter their own data for items not bolded.*

Table 2: Statement of Retained Earnings and Statement of Cash Flows

A	B	C	D	E	F	G	H
38	STATEMENT OF RET. EARNINGS	Yr 0	Yr 1	Yr 2	Yr 3	Yr 4	Yr 5
39	Old Retained Earnings		0	29,440	54,636	68,206	93,273
40	Net Income		29,440	25,197	33,569	55,067	201,819
41	Dividends		0	0	20,000	30,000	0
42	New Retained Earnings		29,440	54,636	68,206	93,273	295,092
43							
44	STATEMENT OF CASH FLOWS	Yr 0	Yr 1	Yr 2	Yr 3	Yr 4	Yr 5
45	Net Income		29,440	25,197	33,569	55,067	201,819
46	Depreciation		32,464	43,264	26,464	19,864	17,164
47	<u>Increases in Liabilities</u>						
48	Increase Short Term Bank Loans		-5,000	-5,000	35,000	-25,000	0
49	Increase in Credit Card Loans		25,000	-25,000	0	0	0
50	Increase Current Liabilities 1		0	0	0	0	0
51	Increase Current Liabilities 2		0	0	0	0	0
52	Increase Current Liabilities 3		0	0	0	0	0
53	Increase Current Liabilities 4		0	0	0	0	0
54	Increase Current Liabilities 5		0	0	0	0	0
55	Increase in Long Term Loan 1		25,000	-10,000	-5,000	-10,000	-5,000
56	Increase in Long Term Loan 2		0	0	0	0	0
57	Total Sources of Cash		106,904	28,461	90,033	39,931	213,983
58	<u>Increases in Assets</u>						
59	Increase Asset 2		0	0	0	0	0
60	Increase Asset 3		-10,000	20,000	20,000	-50,000	20,000
61	Increase Asset 4		0	0	0	0	0
62	Increase Asset 5		0	0	0	0	0
63	Increase Asset 6		0	0	0	0	0
64	Increase Asset 7		0	0	0	0	0
65	Increase Long Term Asset 1		0	0	0	0	0
66	Increase Long Term Asset 2		0	0	0	0	0
67	Increase in Equipment		0	0	0	0	0
68	Total Uses of Cash in Operations		-10,000	20,000	20,000	-50,000	20,000
69	<u>Cash Paid to and Received from Stockholders</u>						
70	Increase in Common Stock		7,000	0	0	0	0
71	Dividends		0	0	20,000	30,000	0
72	= Change in Cash Position		123,904	8,461	50,033	59,931	193,983
73							
74	Old Cash		20,000	143,904	152,365	202,398	262,329
75	Plus Change in Cash Position		123,904	8,461	50,033	59,931	193,983
76	New Cash Balance		143,904	152,365	202,398	262,329	456,312

*This table shows the statement of retained earnings and statement of cash flows. The spreadsheet calculates items in bold. Users enter their own data for items not bolded.*

Table 2F: Statement of Retained Earnings and Statement of Cash Flows (Formulae Display)

A	B	C	D	E	F	G	H
38	STMT OF RET. EARN.		Yr 1	Yr 2	Yr 3	Yr 4	Yr 5
39	Old Retained Earn.	=C114	=D114	=E114	=F114	=G114	=H114
40	Net Income	=D35	=E35	=F35	=G35	=H35	
41	Dividends	0	0	20000	30000	0	
42	New Retained Earn.	=D39+D40-D41	=E39+E40-E41	=F39+F40-F41	=G39+G40-G41	=H39+H40-H41	
43							
44	STMT OF CASH FLOWS		Yr 1	Yr 2	Yr 3	Yr 4	Yr 5
45	Net Income	=D35	=E35	=F35	=G35	=H35	
46	Depreciation	=D26:D29	=E26:E29	=F26:F29	=G26:G29	=H26:H29	
47	<u>Increase in Liabilities</u>						
48	Increase ST Loans	=D102-C102	=E102-D102	=F102-E102	=G102-F102	=H102-G102	
49	Increase CC Loans	=D103-C103	=E103-D103	=F103-E103	=G103-F103	=H103-G103	
50	Increase Cur. Liab. 1	=D104-C104	=E104-D104	=F104-E104	=G104-F104	=H104-G104	
51	Increase Cur. Liab. 2	=D105-C105	=E105-D105	=F105-E105	=G105-F105	=H105-G105	
52	Increase Cur. Liab. 3	=D106-C106	=E106-D106	=F106-E106	=G106-F106	=H106-G106	
53	Increase Cur. Liab. 4	=D107-C107	=E107-D107	=F107-E107	=G107-F107	=H107-G107	
54	Increase Cur. Liab. 5	=D108-C108	=E108-D108	=F108-E108	=G108-F108	=H108-G108	
55	Increase LT Loan 1	=D110-C110	=E110-D110	=F110-E110	=G110-F110	=H110-G110	
56	Increase LT Loan 2	=D111-C111	=E111-D111	=F111-E111	=G111-F111	=H111-G111	
57	Total Sources	=D45:D56	=E45:E56	=F45:F56	=G45:G56	=H45:H56	
58	<u>Increases in Assets</u>						
59	Increase Asset 2	=D82-C82	=E82-D82	=F82-E82	=G82-F82	=H82-G82	
60	Increase Asset 3	=D83-C83	=E83-D83	=F83-E83	=G83-F83	=H83-G83	
61	Increase Asset 4	=D84-C84	=E84-D84	=F84-E84	=G84-F84	=H84-G84	
62	Increase Asset 5	=D85-C85	=E85-D85	=F85-E85	=G85-F85	=H85-G85	
63	Increase Asset 6	=D86-C86	=E86-D86	=F86-E86	=G86-F86	=H86-G86	
64	Increase Asset 7	=D87-C87	=E87-D87	=F87-E87	=G87-F87	=H87-G87	
65	Increase LT Asset 1	=D91-C91	=E91-D91	=F91-E91	=G91-F91	=H91-G91	
66	Increase LT Asset 2	=D93-C93	=E93-D93	=F93-E93	=G93-F93	=H93-G93	
67	Increase in Equi.	=D95-C95	=E95-D95	=F95-E95	=G95-F95	=H95-G95	
68	Total	=D59:D67	=E59:E67	=F59:F67	=G59:G67	=H59:H67	
69	<u>Cash from Stockholders</u>						
70	Increase in Com. Stk.	=D113-C113	=E113-D113	=F113-E113	=G113-F113	=H113-G113	
71	Dividends	=D41	=E41	=F41	=G41	=H41	
72	= Change in Cash	*6	*7	*8	*9	*10	
73							
74	Old Cash	=C81	=D81	=E81	=F81	=G81	
75	Plus Change in Cash	=D72	=E72	=F72	=G72	=H72	
76	New Cash Balance	=D74+D75	=E74+E75	=F74+F75	=G74+G75	=H74+H75	

*This table shows formulae for the statement of retained earnings and statement of cash flows. Worksheet 'SI' contains all calculations except depreciation. Worksheet 'DP' contains depreciation computations. \*6 = (D57-D68+D70-D71), \*7 = (E57-E68+E70-E71), \*8 = (F57-F68+F70-F71), \*9 = (G57-G68+G70-G71), \*10 = (H57-H68+H70-H71). The spreadsheet calculates bolded items. Users enter their own data for items not bolded.*

The discussion moves forward to the balance sheet in Table 3 (Table 3F), where users are directed to enter specific business information. Data entry begins by entering data for the initial balance sheet in the Yr. 0 column. This process simply addresses two questions: Which assets will be placed in service?, and 2.) How will funds be obtained to finance these assets?

Users enter amounts for cash and other assets to reflect the cost of items acquired to initiate the business. Users enter capital purchases in the cell corresponding to the intended method of depreciation. Next, users enter sources of funds in the liabilities and equity portion of the balance sheet. Users must make necessary adjustments so that liabilities plus equity equal total assets and the basic accounting relationship holds. To call users attention to a non-conforming balance sheet, the template produces an error message if assets do not equal liabilities plus equity. This message does not appear in the numerical analysis presented here because the balance sheet conforms. However, Table 3F presents coding that produces this message. Specifically, the following error message appears: “The beginning balance sheet entries do not conform to the basic accounting relationship  $\text{Assets} = \text{Liabilities} + \text{Equity}$ . Please adjust the entries to comply with this requirement.”

Users may adjust some balance sheet items in subsequent years to reflect their individual forecasts and preferences. The template automatically incorporates subsequent changes throughout the remainder of the financial statements. For example, if the user increases the common stock level in year 2 by \$7,000, the cash level changes so the statement balances properly. Similarly, an increase in deposits from year 2 to year 3 results in a corresponding decrease in cash.

Some items entered in the initial balance sheet may not be changed in subsequent years. For example, users enter the initial amount of cash. However, the spreadsheet automatically calculates the cash balance in subsequent years. The user inputs capital purchase amounts in the initial year. However, gross depreciable assets remain constant throughout the five-year period. As noted earlier, Section 179 expense election, or some other immediate expensing option, applies to purchases completed after the initial investment.

The final balance sheet line reflects cumulative Section 179 purchases and other immediately expensed purchases. Balance sheets typically do not reflect these assets. Nevertheless, Section 179 purchases that have not worn out represent an asset to the firm. To maintain a running balance of these purchases, the balance sheet reports, in total, Section 179 assets placed into service. This running balance provides a tool to help estimate the sales price of these assets for capital budgeting purposes.

Next, we consider the income statement presented in Table 1 (Table 1F). Users enter sales and expense data. They may make appropriate modifications throughout each operating year. Changes in sales or expenses automatically reflect throughout the remaining statements. The user enters current year Section 179 expense amounts, but does not enter depreciation amounts. The template calculates depreciation automatically based on capital purchases reported in the balance sheet at Time 0. Table 6 (Table 6F), discussed later, demonstrate the depreciation computations. Debt amounts reported on the balance sheet and the average interest rate on loans combine to determine the interest expense. This calculation does not require user intervention.

Table 2 (Table 2F) shows the statement of retained earnings and statement of cash flows. The statement of retained earnings requires a single input. The user enters the dividends paid in each year. The template completes the cash flow statement in the entirety. Information presented elsewhere in the financial statements, transfers directly without user intervention. For example, annual changes in inventory reported in the balance sheet reflect in the cash flow statement.



Table 3: Balance Sheet

A	B	C	D	E	F	G	H
	BALANCE SHEET	Yr 0	Yr 1	Yr 2	Yr 3	Yr 4	Yr 5
80	<u>Assets</u>						
81	Cash	20,000	<b>143,904</b>	<b>152,365</b>	<b>202,398</b>	<b>262,329</b>	<b>456,312</b>
82	Inventory	10,000	10,000	10,000	10,000	10,000	10,000
83	Deposits	53,000	43,000	63,000	83,000	33,000	53,000
84	Asset 4	0	0	0	0	0	0
85	Asset 5	0	0	0	0	0	0
86	Asset 6	0	0	0	0	0	0
87	Asset 7	0	0	0	0	0	0
88	<b>Total Current Assets</b>	<b>83,000</b>	<b>196,904</b>	<b>225,365</b>	<b>295,398</b>	<b>305,329</b>	<b>519,312</b>
89	Long Term Asset MACRS 3YR	30,000	<b>30,000</b>	<b>30,000</b>	<b>30,000</b>	<b>30,000</b>	<b>30,000</b>
90	Accumulated Depreciation 3YR		<b>9,900</b>	<b>23,400</b>	<b>27,900</b>	<b>30,000</b>	<b>30,000</b>
91	Long Term Asset SL 5YR	40,000	<b>40,000</b>	<b>40,000</b>	<b>40,000</b>	<b>40,000</b>	<b>40,000</b>
92	Accumulated Depreciation SL 5YR		<b>8,000</b>	<b>16,000</b>	<b>24,000</b>	<b>32,000</b>	<b>40,000</b>
93	Long Term Asset MACRS 5YR	60,000	<b>60,000</b>	<b>60,000</b>	<b>60,000</b>	<b>60,000</b>	<b>60,000</b>
94	Accumulated Depreciation MACRS 5 YR		<b>12,000</b>	<b>31,200</b>	<b>42,600</b>	<b>49,800</b>	<b>56,400</b>
95	Real Estate 39 Years	100,000	<b>100,000</b>	<b>100,000</b>	<b>100,000</b>	<b>100,000</b>	<b>100,000</b>
96	Accumulated Depreciation RE 39 YR SL		<b>2,564</b>	<b>5,128</b>	<b>7,692</b>	<b>10,256</b>	<b>12,821</b>
97	<b>Total Fixed Assets</b>	<b>230,000</b>	<b>230,000</b>	<b>230,000</b>	<b>230,000</b>	<b>230,000</b>	<b>230,000</b>
98	<b>Total Accumulated Depreciation</b>	<b>0</b>	<b>32,464</b>	<b>75,728</b>	<b>102,192</b>	<b>122,056</b>	<b>139,221</b>
99	<b>Total Assets</b>	<b><u>313,000</u></b>	<b><u>394,440</u></b>	<b><u>379,636</u></b>	<b><u>423,206</u></b>	<b><u>413,273</u></b>	<b><u>610,092</u></b>
100							
101	<u>Liabilities and Equity</u>						
102	Short Term Bank Loans	25,000	20,000	15,000	50,000	25,000	25,000
103	Credit Card Loans	50,000	75,000	50,000	50,000	50,000	50,000
104	Current Liabilities 3	0	0	0	0	0	0
105	Current Liabilities 4	0	0	0	0	0	0
106	Current Liabilities 5	0	0	0	0	0	0
107	Current Liabilities 6	0	0	0	0	0	0
108	Current Liabilities 7	0	0	0	0	0	0
109	<b>Total Current Liabilities</b>	<b>75,000</b>	<b>95,000</b>	<b>65,000</b>	<b>100,000</b>	<b>75,000</b>	<b>75,000</b>
110	Long Term Loans 1	45,000	70,000	60,000	55,000	45,000	40,000
111	Long Term Loans 2						
112	<b>Total Liabilities</b>	<b>120,000</b>	<b>165,000</b>	<b>125,000</b>	<b>155,000</b>	<b>120,000</b>	<b>115,000</b>
113	Common Stock	193,000	200,000	200,000	200,000	200,000	200,000
114	Retained Earnings	0	<b>29,440</b>	<b>54,636</b>	<b>68,206</b>	<b>93,273</b>	<b>295,092</b>
115	<b>Total Equity</b>	<b>193,000</b>	<b>229,440</b>	<b>254,636</b>	<b>268,206</b>	<b>293,273</b>	<b>495,092</b>
116	<b>Total Liabilities and Equity</b>	<b><u>313,000</u></b>	<b><u>394,440</u></b>	<b><u>379,636</u></b>	<b><u>423,206</u></b>	<b><u>413,273</u></b>	<b><u>610,092</u></b>
117	Cumulative Section 179 Purchases		<b>20,000</b>	<b>45,000</b>	<b>65,000</b>	<b>65,000</b>	<b>65,000</b>
118							

*This table shows the balance sheet. The spreadsheet calculates items in bold. Users enter their own data for items not bolded.*

Table 3F: Balance Sheet (Formulae Display)

A	B	C	D	E	F	G	H
	BALANCE SHEET	Yr 0	Yr 1	Yr 2	Yr 3	Yr 4	Yr 5
<b>80</b>	<b>Assets</b>						
<b>81</b>	Cash	20000	=D76	=E76	=F76	=G76	=H76
<b>82</b>	Inventory	10000	10000	10000	10000	10000	10000
<b>83</b>	Deposits	53000	43000	63000	83000	33000	53000
<b>84</b>	Asset 4	0	0	0	0	0	0
<b>85</b>	Asset 5	0	0	0	0	0	0
<b>86</b>	Asset 6	0	0	0	0	0	0
<b>87</b>	Asset 7	0	0	0	0	0	0
<b>88</b>	<b>Total Cur. Assets</b>	=C81:C87	=D81:D87	=E81:E87	=F81:F87	=G81:G87	=H81:H87
<b>89</b>	LT MACRS 3YR	30000	=C89	=D89	=E89	=F89	=G89
<b>90</b>	Acc. D. MACRS 3		=C90+D26	=D90+E26	=E90+F26	=F90+G26	=G90+H26
<b>91</b>	LT SL 5YR	40000	=C91	=D91	=E91	=F91	=G91
<b>92</b>	Acc. Dep. SL 5YR		=C92+D27	=D92+E27	=E92+F27	=F92+G27	=G92+H27
<b>93</b>	LT MACRS 5YR	60000	=C93	=D93	=E93	=F93	=G93
<b>94</b>	Acc. D. MACRS 5		=D28+C94	=E28+D94	=F28+E94	=G28+F94	=H28+G94
<b>95</b>	Real Estate 39	100000	=C95	=D95	=E95	=F95	=G95
<b>96</b>	Acc. Dep. RE 39		=C96+D29	=D96+E29	=E96+F29	=F96+G29	=G96+H29
<b>97</b>	<b>Total Fixed Assets</b>	*11	*12	*13	*14	*15	*16
<b>98</b>	<b>Total Acc. Dep.</b>	*17	*18	*19	*20	*21	*22
<b>99</b>	<b>Total Assets</b>	=C88+C97-C98	=D88+D97-D98	=E88+E97-E98	=F88+F97-F98	=G88+G97-G98	=H88+H97-H98
<b>100</b>							
<b>101</b>	<b>Liabilities &amp; Equity</b>						
<b>102</b>	ST Bank Loans	25000	20000	15000	50000	25000	25000
<b>103</b>	Credit Card Loans	50000	75000	50000	50000	50000	50000
<b>104</b>	Current Liabilities 3	0	0	0	0	0	0
<b>105</b>	Current Liabilities 4	0	0	0	0	0	0
<b>106</b>	Current Liabilities 5	0	0	0	0	0	0
<b>107</b>	Current Liabilities 6	0	0	0	0	0	0
<b>108</b>	Current Liabilities 7	0	0	0	0	0	0
<b>109</b>	<b>Total Cur. Liab.</b>	=C102:C108	=D102:D108	=E102:E108	=F102:F108	=G102:G108	=H102:H108
<b>110</b>	Long Term Loans 1	45000	70000	60000	55000	45000	40000
<b>111</b>	Long Term Loans 2						
<b>112</b>	<b>Total Liabilities</b>	=C109:C111	=D109:D111	=E109:E111	=F109:F111	=G109:G111	=H109:H111
<b>113</b>	Common Stock	193000	200000	200000	200000	200000	200000
<b>114</b>	Retained Earnings	0	=D42	=E42	=F42	=G42	=H42
<b>115</b>	<b>Total Equity</b>	=C113:C114	=D113:D114	=E113:E114	=F113:F114	=G113:G114	=H113:H114
<b>116</b>	<b>Total Liab. &amp; Eq.</b>	=C112+C115	=D112+D115	=E112+E115	=F112+F115	=G112+G115	=H112+H115
<b>117</b>	Cum. Sec. 179		=D25	=D117+E25	=E117+F25	=F117+G25	=G117+H25
<b>118</b>	*23						

This table shows formulae for the balance sheet. Worksheet 'SI' contains all calculations except depreciation and messages. Worksheet 'DP' contains depreciation computations. Worksheet EM, cell A1, contains the following message: "Beginning balance sheet entries do not conform to the limitation Assets = Liabilities + Equity." \*11 = C89+C91+C93+C95, \*12 = D89+D91+D93+D95, \*13 = D89+D91+D93+D95, \*14 = F89+F91+F93+F95, \*15 = G89+G91+G93+G95, \*16 = H89+H91+H93+H95. \*17 = C90+C92+C94+C96, \*18 = D90+D92+D94+D96, \*19 = E90+E92+E94+E96, \*20 = F90+F92+F94+F96, \*21 = G90+G92+G94+G96, \*22 = H90+H92+H94+H96. \*23 = if(C99=C116,""EM!A1). The spreadsheet calculates bolded items. Users enter their own data for items not bolded.

Careful readers will notice that dividends appear both on the statement of retained earnings and the statement of cash flows. However, the bolded dividend amount listed in the statement of cash flows indicates the user should not adjust this figure. The user enters the dividend amount in the statement of retained earnings. The template automatically transfers the amount to the statement of cash flows.

Table 4 (Table 4F) presents the capital budget analysis. Most required elements for the capital budget transfer directly from information entered earlier. However, users enter terminal cash flows that occur at the 5<sup>th</sup>-year end. The template automatically calculates the cash terminal cash amount. The user enters sale prices for each current asset as well as all capital assets at the close of the 5<sup>th</sup> year of operations. Formulas incorporated in the spreadsheet for demonstration assumes sale of these items an amount equaling the purchase price. However, the items are not bolded, so users may override these computations. The template calculates tax due on sales of capital assets, and tax due on current asset sales automatically. The spreadsheet assumes payment in full of all liabilities and calculates the amounts automatically.

Users indicate the value of owner donated labor to the firm. Users sometimes overlook opportunity costs of the owner's time when computing the capital budget. They do not include the owner's labor as an expense to the firm. Incorporating this cost into the capital budget produces a more informed result. The line titled Non-Expensed Owner Labor allows users to enter the appropriate amount. The template calculates the Net Present Value (NPV) and Internal Rate of Return (IRR). The NPV uses the WACC, calculated in Table 5 (Table 5F), for the discount rate.

Table 5 (Table 5F) provides data on some calculated variables, computes the firm value and calculates financial ratios. Calculated variables include the proportion of funds obtained from equity and the proportion of funds obtained from debt at the outset of the analysis. These proportions combine with cost of funds data entered earlier to compute the WACC used in Net Present Value computations.

Table 5 (Table 5F) continues by calculating firm value. The process begins by calculating an adjusted EBIT that recognizes the value of non-expensed owner labor contributions to the firm. Firm value computations incorporate the adjusted EBIT. Firm value equals a maximum of the going concern value or liquidation value of the firm. The going concern value utilizes an adapted version of the work of Jalbert (2002). This method applies to firm's subject to the pass-through taxation system. Total common equity proxies for the firm's liquidation value. Given an expected level of earnings before interest and taxes,  $E(EBIT)$ , an interest expense,  $I$ , a capital gains tax rate,  $T_{PS}$ , a cost of equity,  $K_E$ , a cost of borrowing,  $K_D$ , and common equity,  $CE$ , the value of an unlevered firm,  $V_U$ , and a levered firm,  $V_L$ , respectively equals:

$$V_U = \text{Max}\left(\frac{E(EBIT)(1 - T_{PS})}{K_E}, CE\right) \quad (1)$$

$$V_L = \text{Max}\left(\frac{E(EBIT)(1 - T_{PS})}{K_E} + \frac{I[(1 - T_{PB}) * (1 - T_{PS})]}{K_D}, CE\right) \quad (2)$$

In a similar manner, the analysis includes calculations of firm value for a firm subject to double taxation. Based on the work of Miller, 1977, and given a corporate tax rate,  $T_C$ , equations 2 and 3 show calculations for the value of an unlevered firm,  $V_U$ , and a levered firm,  $V_L$  respectively.

$$V_U = \text{Max}\left(\frac{E(EBIT)(1 - T_{PS})(1 - T_C)}{K_E}, CE\right) \quad (3)$$

$$V_L = \text{Max}\left(\frac{E(EBIT)(1 - T_{PS})(1 - T_C)}{K_E} + \frac{I[(1 - T_{PB})(1 - T_{PS})(1 - T_C)]}{K_D}, CE\right) \quad (4)$$

Table 4: Capital Budget Analysis

A	B	C	D	E	F	G	H
120	CAPITAL BUDGET ANALYSIS	Yr 0	Yr 1	Yr 2	Yr 3	Yr 4	Yr 5
121							
122	Sales		300,000	325,000	295,000	300,000	600,000
123	Less General Excise Tax		12,501	13,543	12,293	12,501	25,002
124	Cost of Goods Sold		120,000	130,000	118,000	120,000	240,000
125	Labor		15,000	15,000	15,000	15,000	15,000
126	Employee Benefits		2,000	2,000	2,000	2,000	2,000
127	Utilities		5,000	5,000	5,000	5,000	5,000
128	Advertising		10,000	10,000	8,000	10,000	10,000
129	Rent		40,000	40,000	40,000	40,000	40,000
130	Expense 4		0	0	0	0	0
131	Expense 5		0	0	0	0	0
132	Current Year Section 179 Purchases		20,000	25,000	20,000	0	0
133	Depreciation MACRS 3YR		9,900	13,500	4,500	2,100	0
134	Depreciation SL 5YR		8,000	8,000	8,000	8,000	8,000
135	Depreciation MACRS 5YR		12,000	19,200	11,400	7,200	6,600
136	Depreciation SL 39 Year Real Estate		2,564	2,564	2,564	2,564	2,564
137	EBIT		43,035	41,193	48,243	75,635	245,834
138	Interest		8,400	11,550	8,750	10,850	8,400
139	EBT		34,635	29,643	39,493	64,785	237,434
140	Tax		5,195	4,446	5,924	9,718	35,615
141	Net Income		29,440	25,197	33,569	55,067	201,819
142	Depreciation MACRS 3YR		9,900	13,500	4,500	2,100	0
143	Depreciation SL 5YR		8,000	8,000	8,000	8,000	8,000
144	Depreciation MACRS 5YR		12,000	19,200	11,400	7,200	6,600
145	Depreciation SL 39 Year Real Estate		2,564	2,564	2,564	2,564	2,564
146	Non-Expensed Owner Labor		20,000	20,000	20,000	20,000	20,000
147	Total Operating Cash Flows		41,904	48,461	40,033	54,931	198,983
148	Plus After Tax Interest Expense		6,552	9,009	6,825	8,463	6,552
149	Capital Budgeting Operating Cash Flows		48,456	57,470	46,858	63,394	205,535

Table 4: Capital Budget Analysis (Continued)

A	B	C	D	E	F	G	H
		Yr 0	Yr 1	Yr 2	Yr 3	Yr 4	Yr 5
152	<b>CAPITAL BUDGET (CONTINUED)</b>						
153	Cash	<b>-20,000</b>					
154	Other Current Assets	<b>-63,000</b>					
155	Current Liabilities	<b>75,000</b>					
156	Long Term Asset MACRS 3YR	<b>-30,000</b>					
157	Long Term Asset SL 5YR	<b>-40,000</b>					
158	Long Term Asset MACRS 5YR	<b>-60,000</b>					
159	Real Estate 39 Years	<b>-100,000</b>					
160	Cash Flow	<b>-238,000</b>					
161							
162	Cash						<b>456,312</b>
163	Recovery of Current Assets						63,000
164	Payment of Current Liabilities						<b>-75,000</b>
165	Sale of 179 Expense Election Assets						20,000
166	Long Term Asset MACRS 3YR						30,000
167	Long Term Asset SL 5YR						25,000
168	Long Term Asset MACRS 5YR						60,000
169	Real Estate 39 Years						90,000
170	Tax on Gain on Sale of Current Assets						<b>0</b>
171	Tax on Sale of 179 Expense Election Assets						<b>3,000</b>
172	Tax on Long Term Asset MACRS 3YR						<b>4,500</b>
173	Tax on Long Term Asset SL 5YR						<b>3,750</b>
174	Tax on Long Term Asset MACRS 5 YR						<b>8,460</b>
175	Tax on Real Estate Sale						<b>423</b>
176	<b>Total Terminal Cash Flows</b>						<b>649,179</b>
177	<b>Total Cash Flow</b>	<b>-238,000</b>	<b>48,456</b>	<b>57,470</b>	<b>46,858</b>	<b>63,394</b>	<b>854,714</b>
178							
179	NPV	<b>475,579</b>					
180	IRR	<b>0.4271</b>					

*This table shows the capital budget. The spreadsheet calculates items in bold. Users enter their own data for items not bolded*

Table 4F: Capital Budget Analysis (Formulae Display)

A	B	C	D	E	F	G	H
120	CAPITAL BUDGET	Yr 0	Yr 1	Yr 2	Yr 3	Yr 4	Yr 5
121							
122	=B15	=D15	=E15	=F15	=G15	=H15	
123	=B16	=D16	=E16	=F16	=G16	=H16	
124	=B17	=D17	=E17	=F17	=G17	=H17	
125	=B18	=D18	=E18	=F18	=G18	=H18	
126	=B19	=D19	=E19	=F19	=G19	=H19	
127	=B20	=D20	=E20	=F20	=G20	=H20	
128	=B21	=D21	=E21	=F21	=G21	=H21	
129	=B22	=D22	=E22	=F22	=G22	=H22	
130	=B23	=D23	=E23	=F23	=G23	=H23	
131	=B24	=D24	=E24	=F24	=G24	=H24	
132	=B25	=D25	=E25	=F25	=G25	=H25	
133	=B26	=D26	=E26	=F26	=G26	=H26	
134	=B27	=D27	=E27	=F27	=G27	=H27	
135	=B28	=D28	=E28	=F28	=G28	=H28	
136	=B29	=D29	=E29	=F29	=G29	=H29	
137	=B31	=D31	=E31	=F31	=G31	=H31	
138	=B32	=D32	=E32	=F32	=G32	=H32	
139	=B33	=D33	=E33	=F33	=G33	=H33	
140	=B34	=D34	=E34	=F34	=G34	=H34	
141	=B35	=D35	=E35	=F35	=G35	=H35	
142	=B133	=D133	=E133	=F133	=G133	=H133	
143	=B134	=D134	=E134	=F134	=G134	=H134	
144	=B135	=D135	=E135	=F135	=G135	=H135	
145	=B136	=D136	=E136	=F136	=G136	=H136	
146	Non-Exp. Owner Labor	20000	20000	20000	20000	20000	
147	Total Op. Cash Flows	*24	*25	*26	*27	*28	
148	Plus After Tax Interest	=D138*(1-SC\$8)	=E138*(1-SC\$8)	=F138*(1-SC\$8)	=G138*(1-SC\$8)	=H138*(1-SC\$8)	
149	Budgeting Op. Cash Flows	=(D147+D148)	=(E147+E148)	=(F147+F148)	=(G147+G148)	=(H147+H148)	

Table 4F: Capital Budget Analysis (Formulae Display) (Continued)

<b>A</b>	<b>B</b>	<b>C</b>	<b>D</b>	<b>E</b>	<b>F</b>	<b>G</b>	<b>H</b>
<b>152</b>	<b>CAPITAL BUDGET (CONT)</b>	<b>Yr 0</b>	<b>Yr 1</b>	<b>Yr 2</b>	<b>Yr 3</b>	<b>Yr 4</b>	<b>Yr 5</b>
<b>153</b>	=B81	=-C81					
<b>154</b>	Other Current Assets	=-(C82:C87)					
<b>155</b>	Current Liabilities	=(C102:C108)					
<b>156</b>	=B89	=-C89					
<b>157</b>	=B91	=-C91					
<b>158</b>	=B93	=-C93					
<b>159</b>	=B95	=-C95					
<b>160</b>	Cash Flow	=(C153:C159)					
<b>161</b>							
<b>162</b>	=B81						=H81
<b>163</b>	Recovery of Current Assets						=-C154
<b>164</b>	Pmt. of Current Liabilities						=-C155
<b>165</b>	Sale of Section 179 Assets						20000
<b>166</b>	=B156						30000
<b>167</b>	=B157						25000
<b>168</b>	=B158						=-C158
<b>169</b>	=B159						90000
<b>170</b>	Tax on Cur. Assets Gain						*29
<b>171</b>	Tax on Sec. 179 Assets						=H165*C6
<b>172</b>	Tax Asset MACRS 3YR						=DP!E32
<b>173</b>	Tax on SL 5YR						=DP!J32
<b>174</b>	Tax on MACRS 5 YR						=DP!O32
<b>175</b>	Tax on Real Estate Sale						=DP!T32
<b>176</b>	Total Terminal Cash Flows						*31
<b>177</b>	Total Cash Flow	=C160	=D149	=E149	=F149	=G149	=SUM(H149+H176)
<b>178</b>							
<b>179</b>	NPV	*30					
<b>180</b>	IRR	=IRR(C177:H177)					

*This table shows formulae for the capital budget.. Worksheet 'SI' contains all calculations except depreciation. Worksheet 'DP' contains depreciation computations. \*24 =(D141:D145)-D146, \*25 =(E141:E145)-E146, \*26 =(F141:F145)-F146, \*27 =(G141:G145)-G146, \*28 =(H141:H145)-H146. \*29 =SUM((H163+C154)\*\$C\$6, \*30 =NPV(C187,D177:H177)+C177. \*31 =(H162:H169)-(H170:H175). The spreadsheet calculates bolded items. Users enter their own data for items not bolded.*

Table 5: Calculated Variables, Firm Value and Ratio Analysis

A	B	C	D	E	F	G	H	I
183	<b>CALCULATED VARIABLES</b>							
184								
185	Proportion of Funds From Equity	<b>0.6166</b>						
186	Proportion of Funds from Debt	<b>0.3834</b>						
187	Cost of Capital (WACC)	<b>0.0955</b>						
188								
189	<b>COMPUTATION OF FIRM VALUE</b>							
190		<b>Yr 0</b>	<b>Yr 1</b>	<b>Yr 2</b>	<b>Yr 3</b>	<b>Yr 4</b>	<b>Yr 5</b>	
191	EBIT		43,035	41,193	48,243	75,635	245,834	
192	Unexpensed Value of Owners Time		20,000	20,000	20,000	20,000	20,000	
193	EBIT for Valuation		23,035	21,193	28,243	55,635	225,834	
194								
195	<b><u>Firm Value: Pass-Through Taxation (Jalbert Method)</u></b>							
196								
197	Value of Unlevered Firm		229,440	254,636	268,206	394,081	1,599,657	
198	Value of Levered Firm		229,440	254,636	268,206	386,331	1,593,657	
199	Gain from Leverage		0	0	0	-7,750	-6,000	
200								
201	<b><u>Firm Value: Double Taxation (Miller Method)</u></b>							
202								
203	Value of Unlevered Firm		229,440	254,636	268,206	307,383	1,247,732	
204	Value of Levered Firm		245,880	277,241	285,331	328,618	1,264,172	
205	Gain from Leverage		16,440	22,605	17,125	21,235	16,440	
206								
207	<b>COMPUTATION OF FINANCIAL RATIOS</b>							
208		<b>Yr 0</b>	<b>Yr 1</b>	<b>Yr 2</b>	<b>Yr 3</b>	<b>Yr 4</b>	<b>Yr 5</b>	<b>RMA</b>
209	Total Asset Turnover		0.761	0.856	0.697	0.726	0.983	x
210	Return on Assets		0.075	0.066	0.079	0.133	0.331	x
211	Debt to Equity	0.622	0.719	0.491	0.578	0.409	0.232	x
212	Current Ratio	1.107	2.073	3.467	2.954	4.071	6.924	x

*This table shows calculated variables, firm value computations and financial ratio calculations. The spreadsheet calculates bolded items. Users enter their own data for items not bolded.*



Table 5F: Calculated Variables, Firm Value and Ratio Analysis (Formulae Display)

A	B	C	D	E	F	G	H	I
183	<b>CALCULATED VARIABLES</b>							
184								
185	Proportion of Funds from Equity	=C115/C116						
186	Proportion of Funds from Debt	=C112/C116						
187	Cost of Capital (WACC)	*32						
188								
189	<b>COMPUTATION OF FIRM VALUE</b>							
190		Yr 0	Yr 1	Yr 2	Yr 3	Yr 4	Yr 5	
191	EBIT		=D31	=E31	=F31	=G31	=H31	
192	Not expensed Owners Time Value		=D146	=E146	=F146	=G146	=H146	
193	EBIT for Valuation		=D197-D198	=E197-E198	=F197-F198	=G197-G198	=H197-H198	
194								
195	<b><u>Firm Value: Pass-Through Taxation (Jalbert Method)</u></b>							
196								
197	Value of Unlevered Firm		*33	*34	*35	*36	*37	
198	Value of Levered Firm		*38	*39	*40	*41	*42	
199	Gain from Leverage		=D204-D203	=E204-E203	=F204-F203	=G204-G203	=H204-H203	
200								
201	<b><u>Firm Value: Double Taxation (Miller Method)</u></b>							
202								
203	Value of Unlevered Firm		*43	*44	*45	*46	*47	
204	Value of Levered Firm		*48	*49	*50	*51	*52	
205	Gain from Leverage		=D210-D209	=E210-E209	=F210-F209	=G210-G209	=H210-H209	
206								
207	<b>COMPUTATION OF FINANCIAL RATIOS</b>							
208		Yr 0	Yr 1	Yr 2	Yr 3	Yr 4	Yr 5	RMA
209	Total Asset Turnover		=D15/D99	=E15/E99	=F15/F99	=G15/G99	=H15/H99	x
210	Return on Assets		=D35/D99	=E35/E99	=F35/F99	=G35/G99	=H35/H99	x
211	Debt to Equity	=C112/C115	=D112/D115	=E112/E115	=F112/F115	=G112/G115	=H112/H115	x
212	Current Ratio	=C88/C109	=D88/D109	=E88/E109	=F88/F109	=G88/G109	=H88/H109	x

*This table shows formulae for calculated variables, firm value and financial ratios. Worksheet 'SI' contains all calculations except depreciation. Worksheet 'DP' contains depreciation computations. \*32=(C185\*C5)+(C186\*C4\*(1-C7)). \*33=MAX(D193\*(1-\$C\$6)/\$C\$5,D115), \*34=MAX(E193\*(1-\$C\$6)/\$C\$5,E115), \*35=MAX(F193\*(1-\$C\$6)/\$C\$5,F115), \*36=MAX(G193\*(1-\$C\$6)/\$C\$5,G115), \*37=MAX(H193\*(1-\$C\$6)/\$C\$5,H115). \*38=MAX(D197+(D32\*((1-\$C\$7)-(1-\$C\$6)))/\$C\$4,D115) \*39=MAX(E197+(E32\*((1-\$C\$7)-(1-\$C\$6)))/\$C\$4,E115), \*40=MAX(F197+(F32\*((1-\$C\$7)-(1-\$C\$6)))/\$C\$4,F115), \*41=MAX(G197+(G32\*((1-\$C\$7)-(1-\$C\$6)))/\$C\$4,G115) \*42=MAX(H197+(H32\*((1-\$C\$7)-(1-\$C\$6)))/\$C\$4,H115). \*43=MAX(D193\*(1-\$C\$8)\*(1-\$C\$6)/\$C\$5,D115) \*44=MAX(E193\*(1-\$C\$8)\*(1-\$C\$6)/\$C\$5,E115), \*45=MAX(F193\*(1-\$C\$8)\*(1-\$C\$6)/\$C\$5,F115), \*46=MAX(G193\*(1-\$C\$8)\*(1-\$C\$6)/\$C\$5,G115), \*47=MAX(H193\*(1-\$C\$8)\*(1-\$C\$6)/\$C\$5,H115). \*48=MAX(D203+(D32\*((1-\$C\$7)-(1-\$C\$8)\*(1-\$C\$6)))/\$C\$4,D115), \*49=MAX(E203+(E32\*((1-\$C\$7)-(1-\$C\$8)\*(1-\$C\$6)))/\$C\$4,E115) \*50=MAX(F203+(F32\*((1-\$C\$7)-(1-\$C\$8)\*(1-\$C\$6)))/\$C\$4,F115) \*51=MAX(G203+(G32\*((1-\$C\$7)-(1-\$C\$8)\*(1-\$C\$6)))/\$C\$4,G115) \*52=MAX(H203+(H32\*((1-\$C\$7)-(1-\$C\$8)\*(1-\$C\$6)))/\$C\$4,H115). The spreadsheet calculates bolded items. Users enter their own data for items not bolded.*

Equation 5 shows computations of the increase in firm value from borrowing money also called the gain from leverage,  $G_L$ . This equation applies to both the Jalbert (2002) and Miller (1977) approaches.

$$G_L = V_L - V_U \tag{5}$$

The spreadsheet automatically calculates firm value figures based on information introduced elsewhere in the spreadsheet.

Table 5 (Table 5F) further shows the calculation of several financial ratios. In addition to the calculated ratios, the last column provides space for Risk Management Association ratios. Risk Management Associates (RMA) publishes Annual Statement Studies each year. These Annual Statement Studies provide ratios based on average data for firms within an industry. Users should take special care to compare the total asset turnover ratios produced by their calculations to the relevant RMA ratios. Significant differences suggest the business as envisioned may not produce the forecasted results.

Table 6 (Table 6F) shows depreciation calculations. As noted earlier, four depreciation alternatives are offered, 3-year MACRS, 5-year straight line, 5-year MACRS and 39-year straight line. The template automatically completes all depreciation calculations. Users do not adjustment any components of this spreadsheet.

## ASSESSMENT

The author utilizes this template in a junior level undergraduate Small Business Finance course at an AACSB accredited university. Admission to the course required students to have previously completed a principles of finance course. Development of the spreadsheet occurred over a twenty-year period. Early on, the instructor required students to complete the financial analysis without the benefit of a template. Discussion of the requirement commonly produced a bewildered daze from students. The resulting product commonly involved a partial set of financial statements that did not balance along with a variety of analysis problems. Moreover, extensive requests for assistance from students indicated they could not complete the entire financial analysis without some level of assistance.

More recently, the instructor provides students the template presented here. Since incorporating the template, only rarely do students produce unbalanced financial statements. Students focus more on adjusting the spreadsheet to most accurately reflect reality and interpretation of the results.

The template presented here underwent various iterations over time. For professional use, the template should utilize the full automation features presented here. For academic users, reducing the amount of automation may provide a better learning tool for some classes. Some success resulted by providing full automation for the financial statements, but no automation for valuation computations and ratio computations. However, as noted earlier, instructors can adjust the amount of automation provided to meet the needs of a specific class.

Table 6: Depreciation Computations

A	B	C	D	E	F	G	H	I	J
2	MACRS 3 Year				SL 5 Year				
3									
4	<u>Depreciation Taken</u>				<u>Depreciation Taken</u>				
5									
6	Year	Percentage	Cost	Depreciation	Year	Percentage	Cost	Depreciation	
7	0				0				
8	1	0.33	30,000	9,900	1	0.2	40,000	8,000	
9	2	0.45	30,000	13,500	2	0.2	40,000	8,000	
10	3	0.15	30,000	4,500	3	0.2	40,000	8,000	
11	4	0.07	30,000	2,100	4	0.2	40,000	8,000	
12	5	0	30,000	0	5	0.2	40,000	8,000	
13									
14	Total Depreciation Taken			30,000	Total Depreciation Taken			40,000	
15									
16	<u>Book Value</u>				<u>Book Value</u>				
17									
18	Cost of Machine			30,000	Cost of Machine			40,000	
19	Less Depreciation Taken			30,000	Less Depreciation Taken			40,000	
20	= Book Value			0	= Book Value			0	
21									
22	<u>Gain on Sale</u>				<u>Gain on Sale</u>				
23									
24	Sales Price			30,000	Sales Price			25,000	
25	Less Book Value			0	Less Book Value			0	
26	= Gain on Sale			30,000	= Gain on Sale			25,000	
27									
28	<u>Tax on Gain</u>				<u>Tax on Gain</u>				
29									
30	Gain on Sale			30,000	Gain on Sale			25,000	
31	Tax Rate			0.15	Tax Rate			0.15	
32	Tax Due			4,500	Tax Due			3,750	

Table 6: Depreciation Computations (Continued)

K	L	M	N	O	P	Q	R	S	T
2	MACRS 5 Year				39 Year Real Estate				
3									
4	<u>Depreciation Taken</u>				<u>Depreciation Taken</u>				
5									
6	Year	Percentage	Cost	Depreciation	Year	Percentage	Cost	Depreciation	
7	0				0				
8	1	0.2	60,000	12,000	1	0.025641	100,000	2,564	
9	2	0.32	60,000	19,200	2	0.025641	100,000	2,564	
10	3	0.19	60,000	11,400	3	0.025641	100,000	2,564	
11	4	0.12	60,000	7,200	4	0.025641	100,000	2,564	
12	5	0.11	60,000	6,600	5	0.025641	100,000	2,564	
13									
14	Total Depreciation Taken				56,400	Total Depreciation Taken			12,821
15									
16	<u>Book Value</u>				<u>Book Value</u>				
17									
18	Cost of Machine				60,000	Cost of Machine			100,000
19	Less Depreciation Taken				56,400	Less Depreciation Taken			12,821
20	= Book Value				3,600	= Book Value			87,180
21									
22	<u>Gain on Sale</u>				<u>Gain on Sale</u>				
23									
24	Sales Price				60,000	Sales Price			90,000
25	Less Book Value				3,600	Less Book Value			87,180
26	= Gain on Sale				56,400	= Gain on Sale			2,821
27									
28	<u>Tax on Gain</u>				<u>Tax on Gain</u>				
29									
30	Gain on Sale				56,400	Gain on Sale			2,821
31	Tax Rate				0.15	Tax Rate			0.15
32	Tax Due				8,460	Tax Due			423

*This table shows depreciation computations. The spreadsheet calculates all items in this table.*

Table 6F: Depreciation Computations (Formulae Display)

A	B	C	D	E	F	G	H	I	J
2	MACRS 3 Year					SL 5 Year			
3									
4	<u>Depreciation Taken</u>					<u>Dep. Taken</u>			
5									
6	Year	%	Cost	Depreciation	Year	%	Cost	Depreciation	
7	0				0				
8	1	0.33	=S1!\$C\$89	=C8*D8	1	0.2	=S1!\$C\$91	=H8*I8	
9	2	0.45	=S1!\$C\$89	=C9*D9	2	0.2	=S1!\$C\$91	=H9*I9	
10	3	0.15	=S1!\$C\$89	=C10*D10	3	0.2	=S1!\$C\$91	=H10*I10	
11	4	0.07	=S1!\$C\$89	=C11*D11	4	0.2	=S1!\$C\$91	=H11*I11	
12	5	0	=S1!\$C\$89	=C12*D12	5	0.2	=S1!\$C\$91	=H12*I12	
13									
14	Total			=E8:E12	Total			=J8:J12	
15									
16	<u>Book Value</u>					<u>Book Value</u>			
17									
18	Cost of Machine			=D8	Cost of Machine			=I8	
19	Less Depreciation Taken			=E14	Less Depreciation Taken			=J14	
20	= Book Value			=E18-E19	= Book Value			=J18-J19	
21									
22	<u>Gain on Sale</u>					<u>Gain on Sale</u>			
23									
24	Sales Price			=S1!H166	Sales Price			=S1!H167	
25	Less Book Value			=E20	Less Book Value			=J20	
26	= Gain on Sale			=E24-E25	= Gain on Sale			=J24-J25	
27									
28	<u>Tax on Gain</u>					<u>Tax on Gain</u>			
29									
30	Gain on Sale			=E26	Gain on Sale			=J26	
31	Tax Rate			=S1!\$C\$6	Tax Rate			=S1!\$C\$6	
32	Tax Due			=E30*E31	Tax Due			=J30*J31	

*This table shows formulae for calculated variables, firm value and financial ratios. Worksheet 'S1' contains all calculations except depreciation. Worksheet 'DP' contains depreciation computations. The spreadsheet calculates all items without user intervention.*

Table 6F: Depreciation Computations (Formulae Display) (Continued)

K	L	M	N	O	P	Q	R	S	T
2	MACRS 5 Year					39 Year Real Estate			
3									
4	<u>Depreciation Taken</u>					<u>Depreciation Taken</u>			
5									
6	Year	%	Cost	Depreciation	Year	%	Cost	Depreciation	
7	0				0				
8	1	0.2	=S1!\$C\$93	=M8*N8	1	0.025641	=S1!\$C\$95	=R8*S8	
9	2	0.32	=S1!\$C\$93	=M9*N9	2	0.025641	=S1!\$C\$95	=R9*S9	
10	3	0.19	=S1!\$C\$93	=M10*N10	3	0.025641	=S1!\$C\$95	=R10*S10	
11	4	0.12	=S1!\$C\$93	=M11*N11	4	0.025641	=S1!\$C\$95	=R11*S11	
12	5	0.11	=S1!\$C\$93	=M12*N12	5	0.025641	=S1!\$C\$95	=R12*S12	
13									
14	Total Depreciation Taken			=O8:O12	Total Depreciation Taken			=T8:T12	
15									
16	<u>Book Value</u>					<u>Book Value</u>			
17									
18	Cost of Machine			=N8	Cost of Machine			=S8	
19	Less Depreciation Taken			=O14	Less Depreciation Taken			=T14	
20	= Book Value			=O18-O19	= Book Value			=T18-T19	
21									
22	<u>Gain on Sale</u>					<u>Gain on Sale</u>			
23									
24	Sales Price			=S1!H168	Sales Price			=S1!H169	
25	Less Book Value			=O20	Less Book Value			=T20	
26	= Gain on Sale			=O24-O25	= Gain on Sale			=T24-T25	
27									
28	<u>Tax on Gain</u>					<u>Tax on Gain</u>			
29									
30	Gain on Sale			=O26	Gain on Sale			=T26	
31	Tax Rate			=S1!\$C\$6	Tax Rate			=S1!\$C\$6	
32	Tax Due			=O30*O31	Tax Due			=T30*T31	

*This table shows formulae for calculated variables, firm value and financial ratios. Worksheet 'S1' contains all calculations except depreciation. Worksheet 'DP' contains depreciation computations. The spreadsheet calculates all items without user intervention.*

### CONCLUDING COMMENTS

This paper presents pro-forma financial statements. Users enter information for managerial determined variables only. The template produces all other computations automatically. Throughout the template, each time a user adjusts an account value, the remaining accounts automatically reflect the change. The template does not require plug figures and does not result in circular references. Users must simply enter figures into the initial balance sheet that produce an equality between assets and liabilities plus equity. With this condition met, regardless of user inputs, the remaining financial statements will balance.

The financial template was developed, used and tested over a period of 20 years. Experience suggests that most undergraduate students lack the capability to develop the financial analysis without some level of assistance. By utilizing the tool presented here, students easily produce the financial analysis and turn their focus to adjustments that reflect the reality of their business and interpreting the results.

The template presented incorporates some assumptions resulting in some limitations. First, the analysis offers only four depreciation methods. Future developments might include additional methods of depreciation. The template incorporates annual analysis that may not meet the needs of all users. Future research might extend the template to permit monthly analysis. Users wishing to obtain the electronic template version may contact the author.

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## **BIOGRAPHY**

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