Greg Monroe

Dec 11, 2014

MBA 614

Final Project: Family Cash Flow/Budget

Executive Summary

Family Cash Flow description: This last summer my wife and I found ourselves in a situation in which we needed a VERY specific cash flow/budget to see how much money we needed to make and budget in order to make ends meet. Between graduate tuition and having our first baby this year, we need a lot of cash on hand at very specific moments, and yet we have lower-income paying jobs that pay us bi-weekly. As I designed a cash flow to meet our needs, I discovered that the most accurate cash flow system was to show how much cash we have on hand every pay period, but this is complicated by the fact that many cash outflows, or expenses don't occur in even number of weeks, but rather by month (like rent). So I created a rather complicated cash flow/budget that accounts for which months have three rather than two pay periods and accurately shows how much cash we have on hand and will need for 12 months out.

The Problem: While accurate and necessary, our cash flow budget take a long time to update due to the large number of manual tasks, such as figuring out which pay periods have monthly expenses, since they do not all fall evenly. Also, if there were significant changes to our estimates of monthly expenses, this is time-consuming to update and easy to mess up.

The Solution: For my final project, I wrote several macros and created new worksheets and tables that automate all of the above listed tasks. This is broken down into the following steps:

1. I created a macro that updates today's date, the last pay-date, deletes old columns, creates new columns for at least a year out, enters in needed formulas, and reformats the spreadsheet as needed.
2. I created separate worksheets to allow the user to know exactly where to ender the following data: Income estimates, Investment income/liquidations, Recurring expenses (fixed and variable), one-time expenses, savings, and current bank balances.
3. I wrote macros for each of these worksheets that deletes out old cash flow/budget information, reads the new or updated information in each worksheet, and enters it into the appropriate row and column. This includes reading dates and deciding by logic which columns to enter the data into depending on a specific date, or if it is a monthly or bi-weekly cash flow.
4. I created a macro that assists the user in entering in current bank account and credit card information to determine how much cash we have on hand. This assists the user in entering the information without error while looking at other sources for the data.
5. Lastly and most importantly, I created a ribbon with buttons for each of the above macros that will allow my wife to easily and simply update the cash flow/budget too so she is not dependent on me to determine if an expenditure is within our budget.

Implementation Documentation

Outline of Implementation:

1. I wrote a macro that updates today's date, the last pay-date, deletes old columns, creates new columns for at least a year out, enters in needed formulas, and reformats the spreadsheet as needed.
2. I created tables in separate worksheets to allow the user to know exactly where to ender the following data: Income estimates, Investment income/liquidations, Recurring expenses (fixed and variable), One-time expenses, savings, and bank balances.
3. I wrote macros for each of these worksheets that deletes out old cash flow/budget information, reads the new or updated information in each worksheet, and enters it into the appropriate row and column. Please note that this includes reading dates and deciding by logic which columns to enter the data into depending on a specific date, or if it is monthly or bi-weekly.
4. I created a macro that assists the user in entering in current bank account and credit card information to determine how much cash we have on hand. This assists the user in entering the information correctly while looking at other sources for the data.
5. I created a ribbon with buttons for each of the above macros.

Details of Implementation:

1. The main subroutine, updateDate1, accomplishes the main objective of this final project, which is to update the cash flow dates, columns, and formats, which takes up the vast majority of my time when manually updating this spreadsheet. This was accomplished by writing code to do the following:
    a. Rewrite formulas and essential "period counters" in the first row to fail-proof the spreadsheet in case of user edits or errors prior to running the macro.
    b. Determines what today's date is, enters it into the appropriate cell shown below
    c. Then based off of the old pay-date listed it algebraically determines when the last pay date would have occurred. It then updates the last pay date.

FAMILY CASH FLOW PROJECTION			
Today's date:	12/11/2014		
Last pay date:	11/28/2014		
Cash balance alert minimum	$2,500.00		
DATE	Current Cash	11/28/2014	12/12/2014
Cash on hand (beginning of period)	$5,807.00	$5,807.00	$9,427.40

    d. It calculates how many columns of old data and formatting to delete (screen shot shows step before columns deleted):

	B	C	D	E	F	G
		Period:	1	2	3	4
	FAMILY CASH FLOW PROJECTION					
	Today's date:	12/11/2014				
	Last pay date:	11/28/2014				
	Cash balance alert minimum	$2,500.00				
	DATE	Current Cash	10/31/2014	11/14/2014	11/28/2014	12/12/2014
	Cash on hand (beginning of period)	$5,807.00	$5,807.00	$9,427.40	$10,241.80	$8,362.20
	Cash on hand (end of period)		$9,427.40	$10,241.80	$8,362.20	$9,576.60
	CASH RECEIPTS					
	On Campus Job		$264.00	$264.00	$264.00	$264.00
	Red Robin		$1,074.40	$1,074.40	$1,074.40	$1,074.40
	Side Job Name		$50.00	$50.00	$50.00	$50.00

e. It then adds the appropriate number of new columns to the cash flow ready for new formatting and data (note here that it was actually more efficient to delete out old columns of data shift everything to the left and add in the same number of new columns to the right end of the cash flow and reformat only those columns then it was to reformat the whole cash flow/budget worksheet).

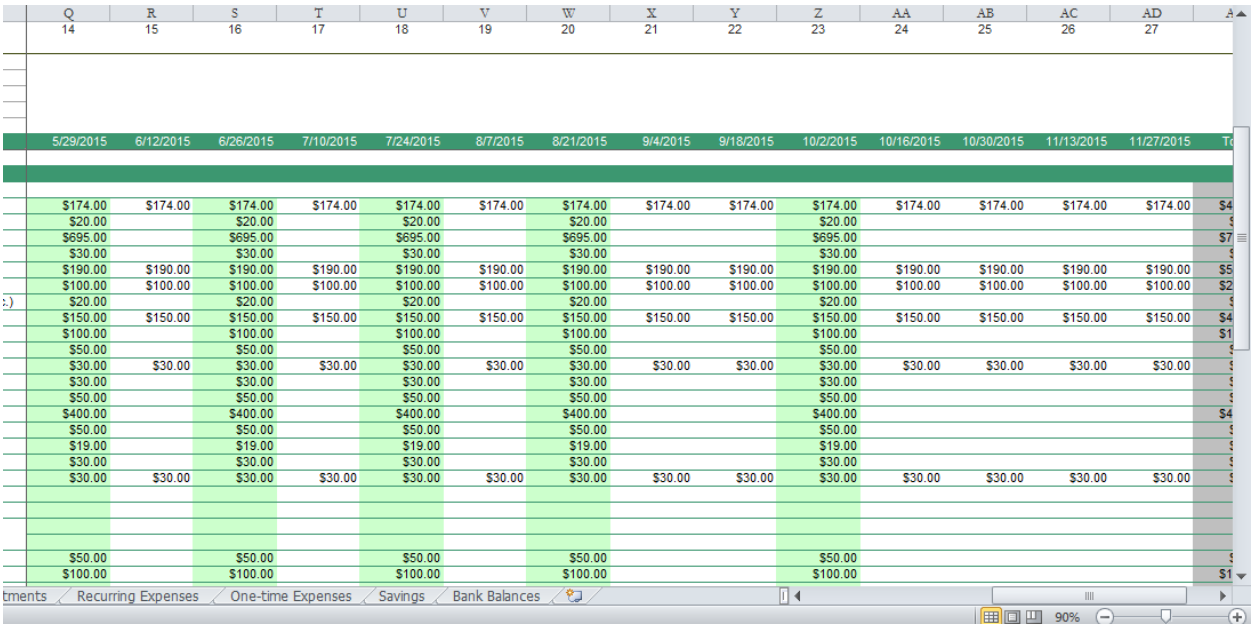
	AA	AB	AC	AD	AE
	24			25	
	/2015	10/16/2015		10/30/2015	Total
	83.80	$12,204.20		$13,418.60	
	04.20	$13,418.60		$13,039.00	
	64.00	$264.00		$264.00	$6,600.0
	74.40	$1,074.40		$1,074.40	$26,860.0
	50.00	$50.00		$50.00	$1,250.0
					$0.0
					$0.0
					$10,000.0
	88.40	$1,388.40		$1,388.40	$44,710.0
	72.20	$13,592.60		$14,807.00	

f. Then using loops and logic it copies over the formulas the appropriate number of columns ending on column 27 to look like the below screen shot.

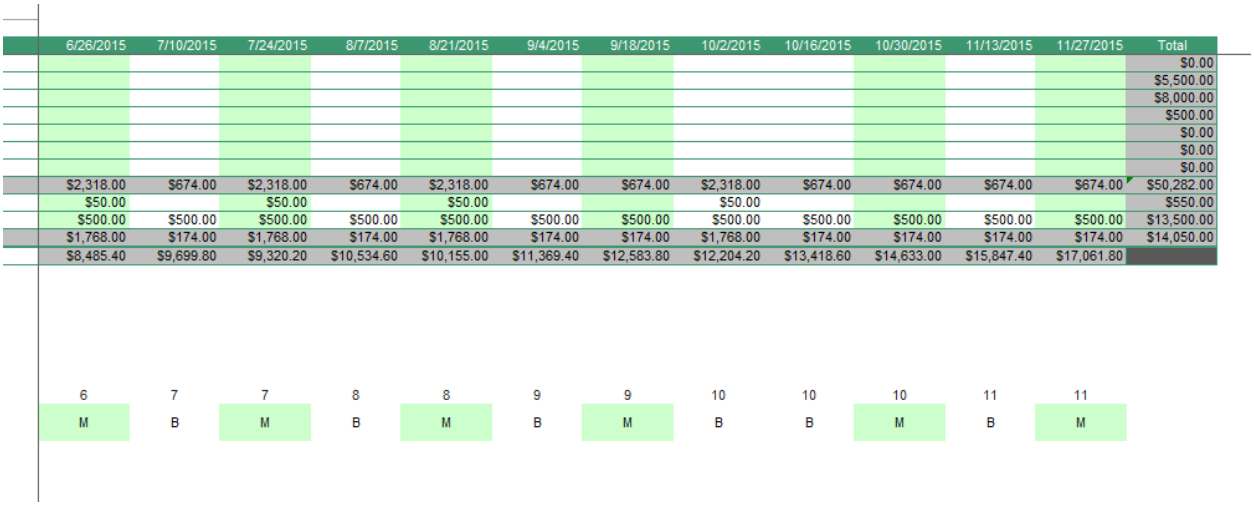
Y	Z	AA	AB	AC	AD	AE	A
22	23	24	25	26	27		

9/18/2015	10/2/2015	10/16/2015	10/30/2015	11/13/2015	11/27/2015	Total
$11,369.40	$12,583.80	$12,204.20	$13,418.60	$14,633.00	$15,847.40	
$12,583.80	$12,204.20	$13,418.60	$14,633.00	$15,847.40	$17,061.80	
$264.00	$264.00	$264.00	$264.00	$264.00	$264.00	$7,128.00
$1,074.40	$1,074.40	$1,074.40	$1,074.40	$1,074.40	$1,074.40	$29,008.80
$50.00	$50.00	$50.00	$50.00	$50.00	$50.00	$1,350.00
						$0.00
						$0.00
						$10,000.00
$1,388.40	$1,388.40	$1,388.40	$1,388.40	$1,388.40	$1,388.40	$47,486.80
$12,757.80	$13,972.20	$13,592.60	$14,807.00	$16,021.40	$17,235.80	

g. Now here is where this macro really begins saving time. Below you can see how the mint colored “monthly expenses” no longer carry through the new columns (four white columns in a row on the right). Because there is either two or three periods of bi-weekly expenses between each monthly expense period the inserting of new rows doesn’t factor this in and it would normally have to be adjusted manually (detailed and time consuming).



h. To determine which columns represent changes in months (could be every two or three columns depending on the month and what date the pay-period is), first I wrote code that identifies which columns have a change in month and then marks and formats each column accordingly. The mint color marks periods (columns) that incur monthly expenses. All columns incur bi-weekly expenses (each pay period).



	6/26/2015	7/10/2015	7/24/2015	8/7/2015	8/21/2015	9/4/2015	9/18/2015	10/2/2015	10/16/2015	10/30/2015	11/13/2015	11/27/2015	Total
													$0.00
													$5,500.00
													$8,000.00
													$500.00
													$0.00
													$0.00
													$0.00
	$2,318.00	$674.00	$2,318.00	$674.00	$2,318.00	$674.00	$674.00	$2,318.00	$674.00	$674.00	$674.00	$674.00	$50,282.00
	$50.00		$50.00		$50.00			$50.00					$550.00
	$500.00	$500.00	$500.00	$500.00	$500.00	$500.00	$500.00	$500.00	$500.00	$500.00	$500.00	$500.00	$13,500.00
	$1,768.00	$174.00	$1,768.00	$174.00	$1,768.00	$174.00	$174.00	$1,768.00	$174.00	$174.00	$174.00	$174.00	$14,050.00
	$8,485.40	$9,699.80	$9,320.20	$10,534.60	$10,155.00	$11,369.40	$12,583.80	$12,204.20	$13,418.60	$14,633.00	$15,847.40	$17,061.80	
	6	7	7	8	8	9	9	10	10	10	11	11	
	M	B	M	B	M	B	M	B	B	M	B	M	

This concludes my first subroutine, updateDate1, which takes care of updating the date, figuring out when the last pay period was, deleting old columns, adding new columns, and formatting those columns in preparation for entering in monthly versus bi-weekly data in other subroutines. This part of the project took a lot of creative thinking and was one of the more difficult parts. I used google quite a bit to find VAB syntax that would allow me to find and measure when months change, as shown at the bottom of the above image. I was then able to mark each column with an "M" or a "B" to refer back to on the rest of my project to know which columns are monthly or bi-weekly. With the help of google I came up with the syntax, but the actual structure of the code was all original thought. This is the only part of the project where I received more than minimal outside help from the internet or other sources.

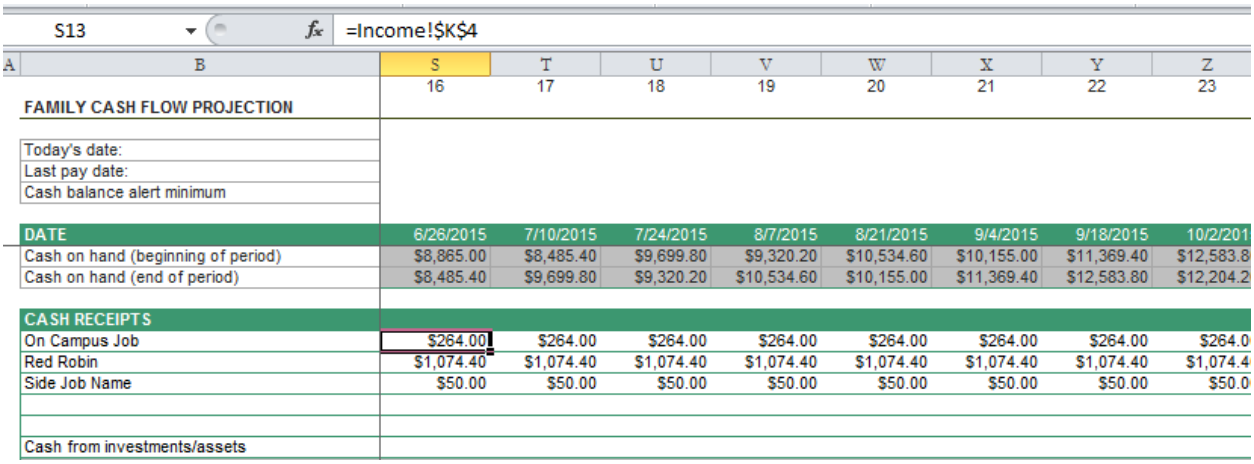
2 (& 3) For the second and third parts of the implementation I created the following organized and clear tables to assist my wife and I in entering in/updating our budget and cash flow information efficiently so it can be auto-populated into the cash flow according to the nature of the income or expense (by specific date or monthly/biweekly). *I will also explain step three of the project implementation as I go through each table I made.*

a. The income estimates worksheet is shown below. Note that I purposely limited it to five rows which each have their own space in the cash flow page. Also, the Gross Income information is essential for accuracy in calculating tithing outflows on the expense worksheet.

Current Income Estimates per pay-check (2 week period)									
Job Name	**Hours/week**	**Hours/paycheck**	**$/hour**	**Gross Income**	**Tax %**	**Taxes**	**Other Withholdings**	**Withholdings $$**	**Cash Inflow**
On Campus Job	10	20	$ 16.50	$ 330.00	20%	$ (66.00)	None	$ -	$ 264.00
Red Robin	40	80	$ 17.00	$ 1,360.00	21%	$ (285.60)	None	$ -	$ 1,074.40
Side Job Name				$ 50.00	0%	$ -	None	$ -	$ 50.00

The subroutine updateIncomeEstimates1 reads each of these rows off the income worksheet, and if there is content in the row, inserts formulas (as shown in the formula bar) referring to this information off of the income sheet as shown on the following

image. This way if the user manually updates any information on the income page it will dynamically flow through to the cash flow/budget.



S13 | =Income!K4

	B	S	T	U	V	W	X	Y	Z
		16	17	18	19	20	21	22	23
	FAMILY CASH FLOW PROJECTION								
	Today's date:								
	Last pay date:								
	Cash balance alert minimum								
	DATE	6/26/2015	7/10/2015	7/24/2015	8/7/2015	8/21/2015	9/4/2015	9/18/2015	10/2/201
	Cash on hand (beginning of period)	$8,865.00	$8,485.40	$9,699.80	$9,320.20	$10,534.60	$10,155.00	$11,369.40	$12,583.8
	Cash on hand (end of period)	$8,485.40	$9,699.80	$9,320.20	$10,534.60	$10,155.00	$11,369.40	$12,583.80	$12,204.2
	CASH RECEIPTS								
	On Campus Job	$264.00	$264.00	$264.00	$264.00	$264.00	$264.00	$264.00	$264.0
	Red Robin	$1,074.40	$1,074.40	$1,074.40	$1,074.40	$1,074.40	$1,074.40	$1,074.40	$1,074.4
	Side Job Name	$50.00	$50.00	$50.00	$50.00	$50.00	$50.00	$50.00	$50.0
	Cash from investments/assets								

Each cash inflow off of the income worksheet is assumed to be biweekly (as all our jobs have been such). Any old formulas are deleted off of the cash flow worksheet and if any row on the income worksheet is left blank, it will show up blank on the cash flow.

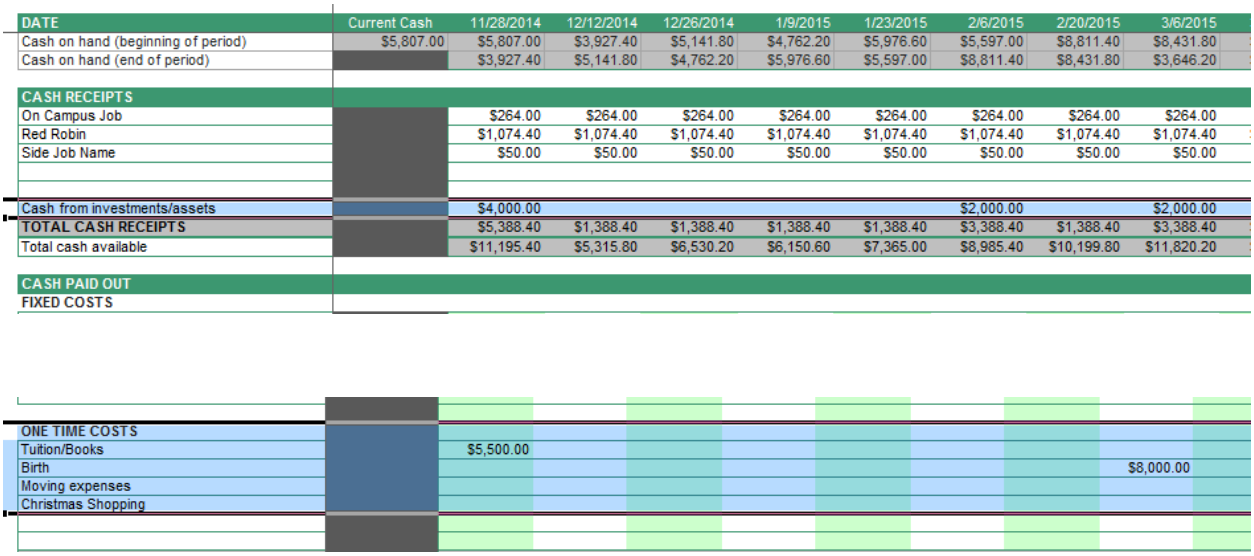
b. The Investments income/liquidation worksheet and the one-time expenses worksheet are shown below. Note that the dates on these worksheets are used to determine where on the cash flow these expenses will be populated.

Investment Income or sale of assets			
Investment Name	**Current Value**	**Date of cash receipt**	**Income or Liquidation**
Ameritrade	$ 8,465.00	1/5/2015	$ 4,000.00
Charles Schwab	$ 4,658.00	4/9/2015	$ 2,000.00
Motorcycle	$ 2,000.00	6/15/2015	$ 2,000.00

One-time expenses			
Expense	**Details**	**Date of payment**	**Amount**
Tuition/Books	Includes books	1/5/2015	$ 5,500.00
Birth	Includes Hospital	4/9/2015	$ 8,000.00
Moving expenses		7/15/2015	$ 500.00
Christmas Shopping		12/20/2014	$ 400.00

The subroutines updateInvestments1, and OneTimeExpenses1 both read the specific dates of each of the rows, read through the columns of the cash flow worksheet, and find the correct row and column in which to enter each cash inflow or outflow as shown below. Note that in the first image below I've highlighted the "Cash from

investments/assets" row to show that each of these cash inflows show up in the same row on purpose, whereas in the following image each cash outflow shows on a different row to show the source of the cash outflow more clearly.



DATE	Current Cash	11/28/2014	12/12/2014	12/26/2014	1/9/2015	1/23/2015	2/6/2015	2/20/2015	3/6/2015
Cash on hand (beginning of period)	$5,807.00	$5,807.00	$3,927.40	$5,141.80	$4,762.20	$5,976.60	$5,597.00	$8,811.40	$8,431.80
Cash on hand (end of period)		$3,927.40	$5,141.80	$4,762.20	$5,976.60	$5,597.00	$8,811.40	$8,431.80	$3,646.20
CASH RECEIPTS									
On Campus Job		$264.00	$264.00	$264.00	$264.00	$264.00	$264.00	$264.00	$264.00
Red Robin		$1,074.40	$1,074.40	$1,074.40	$1,074.40	$1,074.40	$1,074.40	$1,074.40	$1,074.40
Side Job Name		$50.00	$50.00	$50.00	$50.00	$50.00	$50.00	$50.00	$50.00
Cash from investments/assets		$4,000.00					$2,000.00		$2,000.00
TOTAL CASH RECEIPTS		$5,388.40	$1,388.40	$1,388.40	$1,388.40	$1,388.40	$3,388.40	$1,388.40	$3,388.40
Total cash available		$11,195.40	$5,315.80	$6,530.20	$6,150.60	$7,365.00	$8,985.40	$10,199.80	$11,820.20
CASH PAID OUT									
FIXED COSTS									
ONE TIME COSTS									
Tuition/Books		$5,500.00							
Birth									$8,000.00
Moving expenses									
Christmas Shopping									

c. The Recurring Expenses worksheet (for both fixed and variable expenses) and the savings worksheet are below. Note that the monthly or biweekly columns will be used to determine which columns will have each which expenses.

Fixed Expenses		
Fixed Expenses	**Monthly or Biweekly?**	**Amount**
Tithing	Biweekly	$ 174.00
Fast offering	Monthly	$ 20.00
Rent	Monthly	$ 695.00
Utilities	Monthly	$ 30.00
Groceries	Biweekly	$ 190.00
Eating out	Biweekly	$ 100.00
Personal-care (haircut, laundry, toiletries, etc.)	Monthly	$ 20.00
Gas	Biweekly	$ 150.00
Vehicle Repairs	Monthly	$ 100.00
Public Transportation	Monthly	$ 50.00
Dates	Biweekly	$ 30.00
Gifts	Monthly	$ 30.00
Doctor/Dental	Monthly	$ 50.00
Health Insurance	Monthly	$ 400.00
Life Insurance	Monthly	$ 50.00
Vehicle Insurance	Monthly	$ 19.00
School Supplies	Monthly	$ 30.00
Baby Diapers and Wipes	Biweekly	$ 30.00
Variable Expenses	**Monthly or Biweekly?**	**Amount**
Sporting goods	Monthly	$ 50.00
Snowboarding/Hobbies	Monthly	$ 100.00

Savings		
Savings Type	**Monthly or Biweekly?**	**Amount**
Emergency Fund	Monthly	50
Save for Birth	Biweekly	500

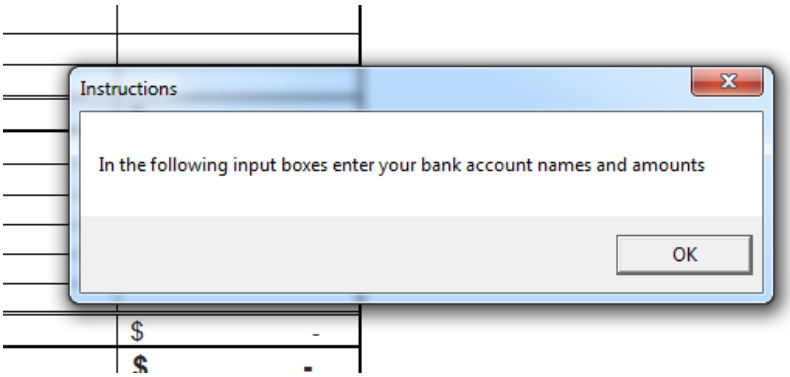
The subroutines updateFixedExpenses1, updateVariableExpenses1, and updateSavings1 each reach through each row on the tables, and if not left blank, insert formulas into the appropriate columns. If it is a biweekly cash flow it goes in each column. If it is a monthly cash flow, it goes only in the designated monthly cash flow columns. I've only included an image of the fixed/variable costs below, but I made sure to show a part of the cash flow that has two columns in a row that are white with only bi-weekly expenses to illustrate what the coding does. This makes our cash flow knowledge very specific and timely!

CASH PAID OUT										
FIXED COSTS										
Tithing	$174.00	$174.00	$174.00	$174.00	$174.00	$174.00	$174.00	$174.00	$174.00	$174.00
Fast offering	$20.00		$20.00		$20.00		$20.00			$20.00
Rent	$695.00		$695.00		$695.00		$695.00			$695.00
Utilities	$30.00		$30.00		$30.00		$30.00			$30.00
Groceries	$190.00	$190.00	$190.00	$190.00	$190.00	$190.00	$190.00	$190.00	$190.00	$190.00
Eating out	$100.00	$100.00	$100.00	$100.00	$100.00	$100.00	$100.00	$100.00	$100.00	$100.00
Personal-care (haircut, laundry, toiletries, etc.)	$20.00		$20.00		$20.00		$20.00			$20.00
Gas	$150.00	$150.00	$150.00	$150.00	$150.00	$150.00	$150.00	$150.00	$150.00	$150.00
Vehicle Repairs	$100.00		$100.00		$100.00		$100.00			$100.00
Public Transportation	$50.00		$50.00		$50.00		$50.00			$50.00
Dates	$30.00	$30.00	$30.00	$30.00	$30.00	$30.00	$30.00	$30.00	$30.00	$30.00
Gifts	$30.00		$30.00		$30.00		$30.00			$30.00
Doctor/Dental	$50.00		$50.00		$50.00		$50.00			$50.00
Health Insurance	$400.00		$400.00		$400.00		$400.00			$400.00
Life Insurance	$50.00		$50.00		$50.00		$50.00			$50.00
Vehicle Insurance	$19.00		$19.00		$19.00		$19.00			$19.00
School Supplies	$30.00		$30.00		$30.00		$30.00			$30.00
Baby Diapers and Wipes	$30.00	$30.00	$30.00	$30.00	$30.00	$30.00	$30.00	$30.00	$30.00	$30.00
VARIABLE COSTS										
Sporting goods	$50.00		$50.00		$50.00		$50.00			$50.00
Snowboarding/Hobbies	$100.00		$100.00		$100.00		$100.00			$100.00

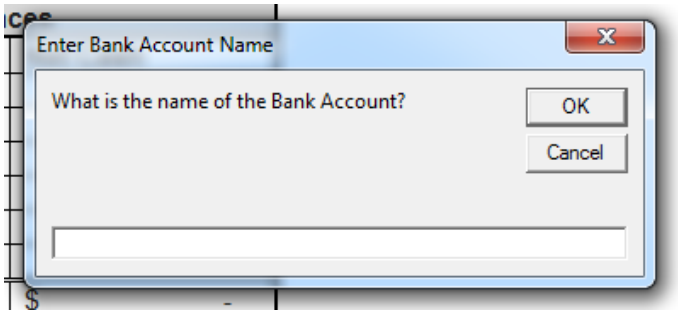
d. Lastly I created a table in which the user can manually insert his or her current cash balances and credit card debts to find net cash on hand. The user can also use a macro with message boxes and input boxes that help the user avoid error, which will be discussed in the following section.

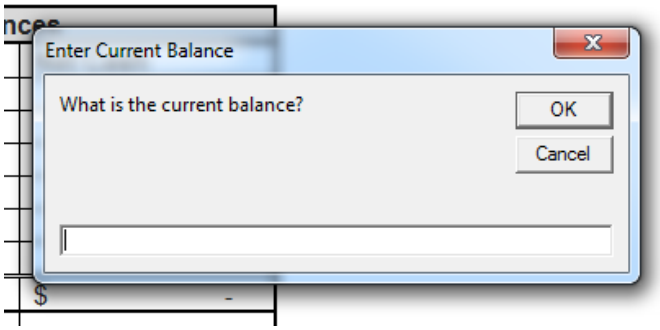
Current Bank Balances		
Checking/Savings Accounts	**Net Cash**	
Chase Checking	$	857.00
Chase Savings	$	3,400.00
Wells Fargo Checking	$	253.00
Bank of America Checking	$	647.00
Zions Savings	$	1,856.00
Subtotal	$	7,013.00
Credit Cards		
Chase	$	945.00
Capital One	$	261.00
Bank of America	$	-
Zions	$	-
Subtotal	$	1,206.00
Total Cash On Hand	**$**	**5,807.00**

4. I wrote the subroutine bankBalances1 to assist the user in entering in the bank account and credit card names and amounts. Usually the user is entering this information from a website such as mint.com or off of the specific bank websites. The message boxes instruct and help the user know where and what to enter. For example when the macro begins the following message box appears.

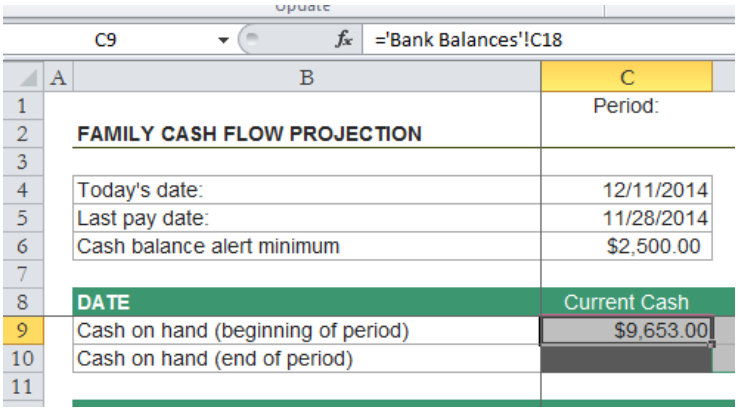


Then the following input boxes appear asking for the name of the bank account and current balances. If the user enters nothing or hits cancel, then it cycles to a similar instruction message box and two input boxes to help the user enter their credit card names and amounts.





Lastly the user is brought back to the Cash Flow worksheet, the updated cash balance is inserted into the appropriate cell via a formula and the user can see how it affects the cash flow/budget.



5. The last step to my project implementation was to create a ribbon with buttons that execute all of the above explained macros. I encountered difficulties getting the images for each button to appear, but after a small pointer from a fellow student I succeeded in getting them to appear.