Instructions for Using the Life Cycle Savings Excel File

Sherman D. Hanna, July 31, 2009. Copyright 2008, 2009.[1]

The purpose of this Excel file is to obtain a rational spending/saving plan for the future, based on conservative projections of household income. In order to use this Excel file, you will need to obtain estimates of Social Security and other pensions, as the spreadsheet will not calculate those (use http://ssa.gov/OACT/quickcalc/index.html). Note in general: all amounts should be in today's dollars, so think about what a salary or item would be today. Once you open the file, save with a meaningful file name, e.g., HannaClient. Save the file frequently. NOTE: the LCS_Example file has a relatively complicated example for a couple. You should start with the LCS file, so that all you have to change are the names, initial salaries, and final salaries. (When working in the Excel file, never insert rows or columns.) The program will produce an estimate of optimal saving each year – you should input current balances on investments, including defined contribution retirement accounts, but not contributions to retirement accounts. You should compare the suggested amount to be saved each year to the total amount going into defined contribution retirement accounts (including any employer contributions) as well as other amounts currently being saved.

The Excel file has five sheets, which can be reached by clicking on the corresponding tab at the bottom of each sheet:

1. **Input0**. This is for the main input of household characteristics. There is more discussion below.
2. **Input1**. This is for the input of subjective risk tolerance. It also has instructions for using the Goal-Seeking Tool of Excel to find the optimal spending pattern over the lifetime.
3. **Input2**. This is for input of a future home purchase if the household does not already own a home, plus other "withdrawals." A withdrawal is any substantial expenditure which is not for a usual spending item and will not typically continue indefinitely. An example is payment of college costs for children. You should never enter planned contributions to investment accounts – the purpose of this program is to tell you the total amount to save each year for all goals. There is also a column for "additions." An example of an addition is an expected inheritance. You should be extremely conservative in including additions, as the program assumes that there is a 100% probability that amounts will be received. It is much more prudent to assume that expected inheritances will not be received. For instance, a widower grandfather could remarry and leave all assets to his new wife.
4. **Input3**. This is for input of future aftertax income. The spreadsheet is set up to estimate employment income each year in the future based on inputs in the Input0 sheet, but you can type over the numbers to allow for a less steady pattern in salaries. The spreadsheet will fill in Social Security pension income in the future based on your inputs in sheet Input0. There are also columns for input of defined benefit pensions, plus income other than from pensions and employment. An example of other income would be rental income. Remember to always be pessimistic in projecting future real income.
5. **Main**. This is mostly for printing the output. Most of this sheet is based on inputs in the other sheets. The only action you take in this sheet is using the Tools/Goalseek feature on the menu bar to find the initial spending level that will smooth spending over the lifetime in a way consistent with total resources and the assumptions of the model.

Input0 Sheet

(Note that as part of self-documentation, information for a case is already in the sheets, so you will need to type over the information in each input cell.)

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Cell B1: enter your name
Cell B2: enter the pseudonym you will be using for the client household.
Cell B3: enter the age of the head (or of the older spouse/partner for a couple household) as of Jan. 1 of the initial year. (Note --- we refer to the "head" but for couple households, think of the older spouse/partner when the term "head" is used.)
Cell B4: enter the age of the younger spouse/partner for a couple household) as of Jan. 1 of the initial year. Enter 0 if the household is not a couple household. (Note – you cannot use a couple household if you can obtain information only from one partner.)
Cell B5: enter the net investments as of Jan. 1 of the initial year. Add up value of all financial assets and non-financial investments such as investment real estate (other than the primary residence,) then subtract balances on student loans, credit cards, and any loans for investments other than the primary residence. (Do NOT include personal residence, or assets that client would never sell. Do NOT subtract vehicle or mortgage debt. Do NOT include balances reported for defined benefit pension plans.) Include only investment assets that would be eventually sold or liquidated. Enter total value of investments that would never be sold in cell E5.
Cell B6: enter initial annual aftertax employment income for the head, total from all jobs and self-employment income. You need to estimate the federal, state, and local income taxes, plus Medicare/FICA taxes, and subtract them from pretax income. You should base your estimate of aftertax employment income from Box 1 of the W2 form, which will not include most mandatory defined benefit pension contributions. If the employee has money withheld for a defined contribution retirement plan such as a 401K, also add that amount back. For self-employment income, estimate based on net self-employment income entered on the 1040 form.
Cell B7: enter initial annual aftertax employment income for the younger partner/spouse, total from all jobs and self-employment income. (Enter 0 if there is no partner/spouse.)
Cell B8: first full calendar year. Generally use current year, although if your clients will not start living together until next year, you could use that year.
Cell B9: enter the age at which the head (or of the older spouse/partner for a couple household) will be retired from his/her main career.
Cell B10: enter the age at which the younger spouse/partner will be retired from his/her main career. Enter 0 if the household is not a couple household.
Cell B11: If your client has his/her Social Security Benefits statement (typically received 3 months before the last birthday) then enter the monthly retirement pension estimate shown. Otherwise, go to ssa.gov and use the Quick Calculator. (See instructions in lower part of Input0 sheet.) If your client is young, it might be better to use the Quick Calculator, as the statement might assume very low salaries.
Cell B12: If younger partner/spouse has his/her Social Security Benefits statement (typically received 3 months before the last birthday) then enter the monthly retirement pension estimate shown. Otherwise, go to ssa.gov and use the Quick Calculator. (Enter 0 if there is no partner/spouse.)
Cell B13: If your client is covered by a defined benefit pension, get an estimate of the monthly pension that would be received at retirement, subtract your estimate of federal, state, and local income taxes, and enter.
Cell B14: If the younger partner is covered by a defined benefit pension, get an estimate of the aftertax monthly pension amount and enter.
Cell C15: This is calculated as the age when the head will start receiving Social Security benefits, assuming the client will start receiving benefits at retirement from the regular career, as the age you input in cell B9, but adjusted to 62 if you entered an age under 62 in cell B9.
Cell C16: Input the age at which the head will start receiving a defined benefit pension.

Cell C17: Input the age at which the spouse/partner will start receiving a defined benefit pension. (Enter 0 if there is no partner/spouse.)
Cell E1: This is the assumed real rate of return on retirement investments (and other investments) before retirement. Do not change without discussing with instructor.
Cell E2: This is the assumed real rate of return on investments after retirement. Do not change without discussing with instructor.
Cell E3: This is aftertax household income other than from pensions or employment income. Example: income from rental properties. The spreadsheet does not do anything with the number you input here, so you will have to input amounts for each year in column J of sheet Input3. Note that the issue of allocation of income taxes is somewhat complex for households with multiple sources of income. Do not be overly concerned about exact calculation of income taxes for each source, just be prepared to explain your assumptions. **Do NOT enter income from assets that you input elsewhere!** Example – if you input $10,000 for a savings account, do not include $400 for interest income. Only input non-employment income that is not connected to assets you enter, e.g., a disability benefit, or alimony or child support payments.
Cell E4: This is a calculated cell, so do not type anything. It is taken from cell K4 of sheet Input3. (It will not include non-employment income until you input it in sheet Input3.)
Cell E5: Enter total value of investments that would never be sold in cell E5.
Example of assets to include: investment real estate, but only if client would never sell the asset.
Cell E6: This is the projected aftertax employment income from the head's job just before retirement, total from all jobs and self-employment income. Note that if the client anticipates a transition from full-time employment to part-time employment, use only the aftertax income just before retirement from full-time employment. Be VERY conservative in projecting future salaries --- it is rare that somebody can be 95% sure that real income will more than double between the start of a career and end of a career. You will need to do a rough estimation of changes in income and payroll taxes if real household income is projected to change very much. For instance, assume that your client has a gross salary of $30,000 today, is single with no dependents, and does not itemize for federal income taxes. Consider the following example: a single person living in Ohio, with a 2% local income tax.

Gross income=	$30,000	$60,000	$90,000	$120,000
Total of federal, state, and local income tax, plus FICA/Medicare taxes	$6,663	$17,835	$30,207	$42,069
Taxes as % of gross income	22%	30%	34%	35%
Aftertax income	$23,337	$42,165	$59,793	$77,931
Aftertax income as % of gross income	78%	70%	66%	65%

I assumed that the standard deduction would be used for federal income taxes, but if a home were purchased when income was higher, that would lower the federal income tax, plus the state and local income taxes could also be used as itemized deductions. At any rate, if the projected changes in income were conservative, e.g., change from $30,000 today to $60,000 at the end of the career (all in today's dollars) you could use the budget spreadsheet for a rough calculation, and you would enter $42,165 as the aftertax employment income just before retirement.

Note that as with cell B6, you should also subtract mandatory pension contributions but do not subtract contributions to Defined Contribution Plans such as 401K plans.

Cell E7: This is the projected aftertax employment income from the younger spouse/partner's job just before retirement. See instructions for Cell E6. Enter 0 if there is no spouse/partner.

Cell E8: This is projected aftertax employment income after the head retires from full-time employment. The spreadsheet does nothing with this number, so you will need to make some reasonable assumptions for inputs in sheet Input3, for instance, in how many years the head would work part-time. If your client prefers not to work part-time after retirement from a full-time job, you should just assume zero income.
Cell E9: This is the age at which the head will no longer be working at any job or self-employment. The spreadsheet does nothing with this number.
Cell E10: This is projected aftertax employment income after the younger spouse/partner retires from full-time employment. See instructions for Cell E8.
Cell E11: This is the age at which the younger spouse/partner will no longer be working at any job or self-employment.
Cell E12: This is the calculated number of years until the head's retirement from full-time employment.
Cell E13: This is the calculated number of years until the younger spouse/partner's retirement from full-time employment.
Cell E14: This is the calculated number of years until the first retirement from full-time employment.
Cell E15: This shows the age at which the younger spouse/partner will start receiving Social Security benefits. See instructions for cell C15.
Cell E16: This is the assumed annual real rate of return for investments entered in cell E5. You can change this but better to leave it at 4%.
Cell E17: Enter initial value of other long-lasting assets not entered elsewhere in sheets INPUT0 or INPUT2. Do not include home, vehicles, furniture, etc. Example of assets to include: investment real estate and a business if client would consider selling the asset
Cell E18: This is the assumed after-inflation interest rate on credit. You should enter the highest interest rate on household debt, so, e.g., if the household carries balances on credit cards that have a nominal interest rate of 22% and the long-term inflation rate is expected to be 3.4%, the real interest rate is about 18% (1.22/1.034 -1).

The rest of sheet INPUT0 has a discussion of using ssa.gov to obtain estimates of Social Security pensions. If you use pessimistic projections of future salaries, and do not optimistically assume that your client can work full-time at a high salary until age 67 (roughly half of retired people retired sooner than planned) the ssa.gov estimates should be reasonable.

Input1 Sheet

Have your client go to http://hec.osu.edu/people/shanna/rts/
The first two screens are for some demographic information – your client can skip those screens, although the information will not be connected to your client and will only be used for general tabulations on risk tolerance. Have your client answer the hypothetical pension gamble questions and report to you the final Subjective Risk Tolerance level, e.g., Moderate.
If your client household includes a couple, have them both independently take the survey.
Cells B5-B11: Type a 1 in cell that corresponds to your client's subjective risk tolerance level. For a couple, enter 1 for each level if different, and spreadsheet will use the lower of the two responses. Example: the husband has Low and the wife has Moderate subjective risk tolerance. Enter a 1 in cell B7, and a 1 in B8.
Cell B15: Calculated number for subjective risk tolerance.
Cell B16: This is the "thriftiness level", initially set at 5. Do not change unless you discuss with the instructor. A number less than 5 typically results in less spending initially, and more than 5, more spending initially. So, a lower number means more "thriftiness."
Cell B20: Enter the amount of precautionary/bequest funds for retirement. This is how much the client would want to have if he/she lived to be age 100 and had no assisted living expenses, etc.

The higher the amount, the more that will be needed to save earlier in life. The spreadsheet does not do anything with this number, but you should keep it in mind when using the Tools/Goalseek feature on the Menu Bar in the Main sheet.
{Note that if the client owns a home, then at the time of death of the client and any spouse/partner, whether at age 100 or earlier, the value of the home will be included in the estate, plus the value you input in cell E5 of sheet Input0, which represents other assets that will not be sold while the client is alive.}
The rest of the Input1 sheet shows a screen shot of the Main sheet when using the Goal Seek Tool. Note that in the popup box you will see after clicking on the Tools/Goal Seeking on the Menu Bar, you will see a cell for Value. For this, type in the target precautionary fund at age 100, e.g., $100,000, or whatever is appropriate for your client.

Input2 Sheet

This sheet is for inputs related to buying a home, unusual major expenses, and possible future additions such as inheritances.
Cell D2: If your client owned a home at the beginning of the current year, type in the market value of the home. (Ignore loan balances.)
Cell A11: Type in description of withdrawals for year 1, e.g., college tuition. (Just keep typing if it more than fills the space --- do not insert extra rows ever, anywhere in the LCS Excel sheet.)
Cell A12: Type in description of withdrawals for year 2. Etc.
Column C. Enter the total purchase price of a home. Everything should be in today's dollars. If your client plans on buying more expensive homes in the future, the program will use the highest value entered as of a particular year in calculating total household wealth. If a previously owned home will be sold, you should take into account a conservative, inflation-adjusted estimate of the home equity that could be used for a down payment, and net that out of the amount you enter in column D for the down payment. (The program will assume that the down payment amount represents additional financial resources that need to be accumulated by that year.)

However, do NOT enter the value of second homes, vacation homes, etc. in column B. The full purchase price of such items should be entered in column E.
Note that in the example Excel file, the client will buy a $200,000 home in the year 2010 and will make $20,000 down payment.

Column D: Down payment for home purchased in that year. Note, after the initial home purchase, when another primary residence is purchased, assume net equity after costs goes for down payment, so you might have zero for subsequent home purchases.
Columns E: Enter full purchase price of permanent assets other than for the purchase of a primary residence, e.g., business, land, second home.
Columns F-H: These are for withdrawals other than for the purchase of a primary residence. Note that in the example Excel file in rows 29-34, college costs are entered in the year the children will be attending college. Do NOT enter planned contributions to college funds. The program will include in its recommendations for savings each year the total of all savings for retirement and other future goals.
In the example Excel file in row 43, the client wants to buy a super RV in the year 2040, and today such an RV would cost $100,000. Therefore, it is a savings goal.

Column K: This is for total household size. Enter 1 and copy down the spreadsheet if the client will be a one-person household forever. If household has couple with no children at home, enter 2 and copy down. If children are planned, increase household size by 1 when planned children are

added to the household, and decrease household size by 1 when a child will no longer be supported.
Column L: Calculated value of current home in constant dollars.
Column N: Calculated value of non-financial assets, other than investment assets that might be eventually sold.

Input3 Sheet

This sheet is for entry of income amounts. For salaries and Social Security pensions, the spreadsheet calculations based on the amounts you put in sheet Input0 might be reasonable. If you included the initial aftertax salary and final aftertax salary, plus Social Security pension amount, in sheet Input0, the spreadsheet will assume a steady increase in salary until the year before the retirement age input in Input0, then start the Social Security pension at age 62 (or later if specified in Input0.)

However, if the client will have other sources of income, you will need to input these as appropriate in sheet Input3. Make sure that you use conservative estimates of aftertax income in terms of today's dollars. **Do NOT enter income from assets that you input elsewhere!** Example – if you input $10,000 for a savings account, do not include $400 for interest income. Only input non-employment income that is not connected to assets you enter, e.g., a disability benefit, or alimony or child support payments. Unlike the employment income and pensions entered in sheet Input0, other income will not automatically be calculated for future years, so you will have to enter this year by year or copy a constant amount down column J. For employment income after the retirement age you input in sheet Input0, you will have to input the amounts year by year in column D (head) or E (partner).

Main Sheet

After inputs in sheets Input0, Input1, Input2, and Input3, the only action left is to use the Goal-Seeking Tool in the Main sheet, and then print the Main sheet.

When you are in the Main sheet, place the cursor in cell N2.
If you have Office 2003, click on Tools, then Goal Seek.
If you have Office 2007, on the Data tab, choose What-If Analysis→Goal Seek in the Data Tools group.

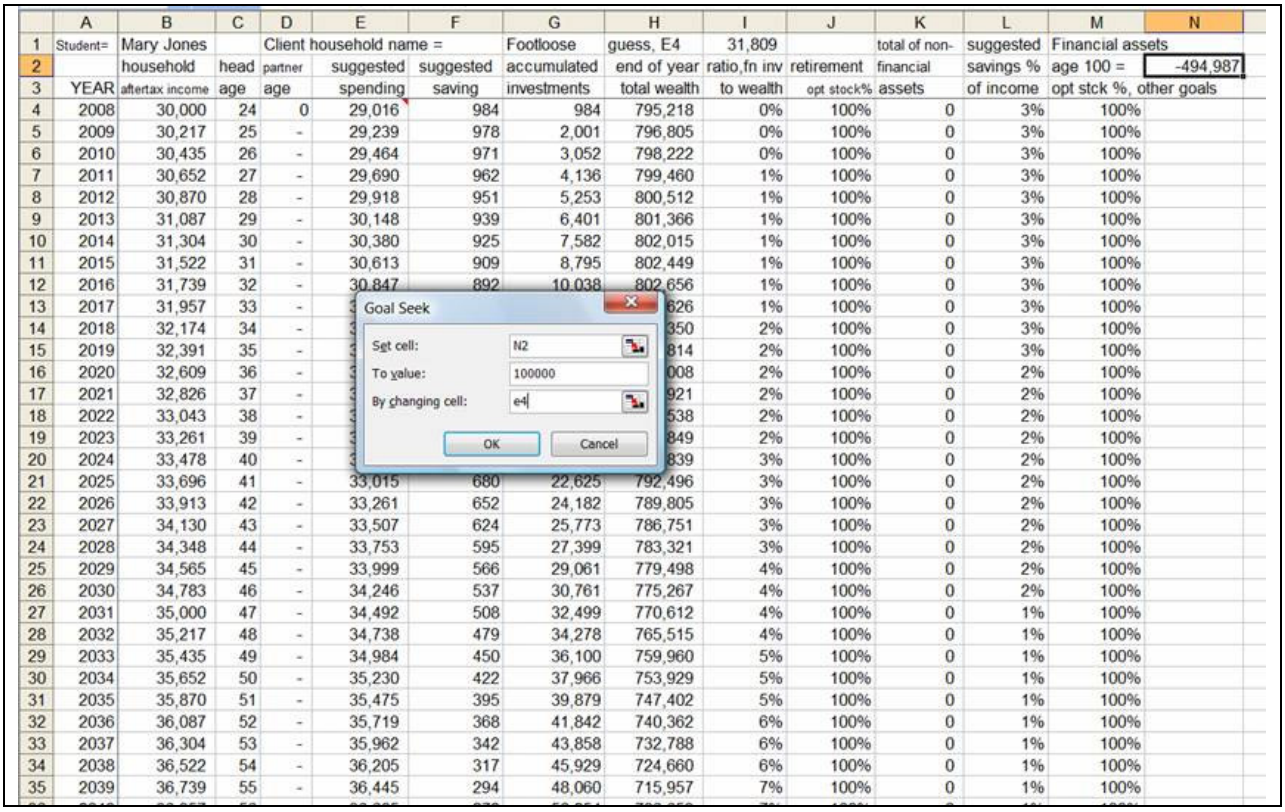
You will see a pop-up box like the one shown on the next page. It should show N2 for "set cell."

For the "To value" box, type in the target precautionary/bequest fund at age 100. (If you type 0 as shown in the example, the household will spend all of its resources if it lives to be 100. Note that the LCS program does NOT assume that the client will live to be 100, and the suggested spending amounts are discounted by the chance that the client die before age 100, but it does show what would happen if the client did live to be 100. If a 30 year old lives to be 65, there is a good chance of living to be 100.)

For the "By changing cell" box, type E4. Then click OK, and you should see "Goal seeking has found a solution." (If it takes more than a second, see box below, **Adjusting Goal Seek**)
Click OK.

If cell N2 has the target net financial assets at age 100, you are done with all inputs, and now you should simply print the Main sheet.

Illustration of Goal Seek process



	A	B	C	D	E	F	G	H	I	J	K	L	M	N
1	Student=	Mary Jones		Client household name =			Footloose	guess, E4	31,809		total of non-	suggested	Financial assets	
2		household	head	partner	suggested	suggested	accumulated	end of year	ratio,fn inv	retirement	financial	savings %	age 100 =	-494,987
3	YEAR	aftertax income	age	age	spending	saving	investments	total wealth	to wealth	opt stock%	assets	of income	opt stck %,	other goals
4	2008	30,000	24	0	29,016	984	984	795,218	0%	100%	0	3%	100%	
5	2009	30,217	25	-	29,239	978	2,001	796,805	0%	100%	0	3%	100%	
6	2010	30,435	26	-	29,464	971	3,052	798,222	0%	100%	0	3%	100%	
7	2011	30,652	27	-	29,690	962	4,136	799,460	1%	100%	0	3%	100%	
8	2012	30,870	28	-	29,918	951	5,253	800,512	1%	100%	0	3%	100%	
9	2013	31,087	29	-	30,148	939	6,401	801,366	1%	100%	0	3%	100%	
10	2014	31,304	30	-	30,380	925	7,582	802,015	1%	100%	0	3%	100%	
11	2015	31,522	31	-	30,613	909	8,795	802,449	1%	100%	0	3%	100%	
12	2016	31,739	32	-	30,847	892	10,038	802,656	1%	100%	0	3%	100%	
13	2017	31,957	33	-				626	1%	100%	0	3%	100%	
14	2018	32,174	34	-				350	2%	100%	0	3%	100%	
15	2019	32,391	35	-				814	2%	100%	0	3%	100%	
16	2020	32,609	36	-				008	2%	100%	0	2%	100%	
17	2021	32,826	37	-				921	2%	100%	0	2%	100%	
18	2022	33,043	38	-				538	2%	100%	0	2%	100%	
19	2023	33,261	39	-				849	2%	100%	0	2%	100%	
20	2024	33,478	40	-				839	3%	100%	0	2%	100%	
21	2025	33,696	41	-	33,015	680	22,625	792,496	3%	100%	0	2%	100%	
22	2026	33,913	42	-	33,261	652	24,182	789,805	3%	100%	0	2%	100%	
23	2027	34,130	43	-	33,507	624	25,773	786,751	3%	100%	0	2%	100%	
24	2028	34,348	44	-	33,753	595	27,399	783,321	3%	100%	0	2%	100%	
25	2029	34,565	45	-	33,999	566	29,061	779,498	4%	100%	0	2%	100%	
26	2030	34,783	46	-	34,246	537	30,761	775,267	4%	100%	0	2%	100%	
27	2031	35,000	47	-	34,492	508	32,499	770,612	4%	100%	0	1%	100%	
28	2032	35,217	48	-	34,738	479	34,278	765,515	4%	100%	0	1%	100%	
29	2033	35,435	49	-	34,984	450	36,100	759,960	5%	100%	0	1%	100%	
30	2034	35,652	50	-	35,230	422	37,966	753,929	5%	100%	0	1%	100%	
31	2035	35,870	51	-	35,475	395	39,879	747,402	5%	100%	0	1%	100%	
32	2036	36,087	52	-	35,719	368	41,842	740,362	6%	100%	0	1%	100%	
33	2037	36,304	53	-	35,962	342	43,858	732,788	6%	100%	0	1%	100%	
34	2038	36,522	54	-	36,205	317	45,929	724,660	6%	100%	0	1%	100%	
35	2039	36,739	55	-	36,445	294	48,060	715,957	7%	100%	0	1%	100%	

Adjusting Goal Seek

If cell N2 does **not** equal your target net financial assets at age 100 (and Goal Seek process took more than a second) you have a problem – probably caused by projecting that real aftertax salaries would more than double by retirement.

To finish the Goal Seek Process, consider 2 alternatives

1. If cell N2 has an amount **less** than the target you input, e.g., it has -$322,388 and you input $100,000, then take $1 off of the amount in E4. You should see an amount in N2 that is higher than your target.
2. If cell N2 has an amount **more** than the target you input, e.g., it has $265,868 and you input $100,000, then add $1 to the amount in E4. You should see an amount in N2 that is lower than before.

However, if the new amount is **lower** than your target, then go back to the solution from the Goal Seek, in other words, take off the $1 from the amount in E4.

Do NOT make any adjustments to Print Setup, though it might be prudent to click File/Print Preview. You should see 4 pages. Then just click print. (If you make any adjustments, you are very likely to end up with a huge number of pages.)
The four pages include:

Page 1:

Aftertax household income each year
Suggested spending each year (not counting withdrawals)
Suggested amount to save out of income each year. (Note that this includes all contributions for all savings goals, so, for instance, if the client is contributing $10,000 to a 401K plan and the employer is contributing an additional $5,000, you should compare the LCS suggested amount to the total of $15,000 that will be contributed.) Suggested saving=income-suggested spending-withdrawals+additions
Accumulated financial investments at the end of each year.
Total household wealth at the end of each year, including human wealth.
Ratio of financial assets to total wealth.
Suggested percent of the retirement portfolio that should be allocated to stocks (large + small)
Total of non-financial assets.
Suggested amount to save each year as a percent of aftertax household income.
Suggested percent of the portfolios for other goals that should be allocated to stocks (large + small), assuming that each goal is 5 years away. (Use a more conservative allocation if the goal is within 5 years.)

Page 2:

Rest of table from page 1, if you had a very young client. The information you input in sheet Input0 and Input1, plus the initial estimate of human wealth. Graph showing LCS suggested amount to spend, and aftertax income. Typically the spending pattern will be very smooth, with a slight increase over time except when household size is expected to decrease. Graph showing financial assets over time, assuming that LCS spending/saving suggestions are followed.

Page 3:

Graph showing suggested annual saving as a percent of income.
Graph showing suggested stock percent of the retirement and other portfolios.
Table showing different aftertax income components for each year.

Page 4:

Rest of table from page 3.
Table showing home purchases, withdrawals, and additions for each year. (This table does not include the columns from sheet Input2 with Withdrawals #2 and #3, though it does show the total of withdrawals for each year. If you had more than 1 withdrawal for a year, you would need to also print sheet Input2. **Otherwise, there is no need to print the other sheets.**