

## Description of columns on main tab (“Sheet1”) of “TFIR Pension Choice Model” spreadsheet

The user of the Excel model can enter various parameters such as age at hire and starting salary on the “home page.” The user should also specify whether the simulations are for faculty or staff, since the salary growth profiles and supplemental Defined Contribution plans differ between the two groups.

Clicking the GO button then generates projections consistent with the assumptions, some of which are built-in (and described below).

A: Age at the beginning of the plan year. The age at hire is entered on the home page and the rest is automatic. To interpret each row in the spreadsheet, think of the hypothetical individual as confronting all of the information in that row upon reaching the age shown and starting the year with the information shown. For instance, the salary shown will be the new salary for the coming year; accumulated balances in defined-contribution plans will be the balances at the beginning of the year.

B: Service to date. For any row, the service figure is the service to date; accumulated service credits at the beginning of the year.

C: Salary growth figures taken from Segal assumptions. The figures used are entered in Column BA (for faculty) or BB (for staff); the formula in column C selects the appropriate column based on the Faculty/Staff choice selected on the homepage.

D: Salary the individual can expect for each year. The starting salary is entered and then the salary growth figure that is appropriate (faculty or staff), the inflation rate entered on the home page, and an additional half-percent growth is assumed. This follows Segal assumptions.

E: The IRS limit on covered compensation is set at its current value initially, then assumed to grow at the rate of inflation. This is a built-in assumption, though there is no formal link between the covered-compensation limit (CCL) and the rate of inflation.

F: The PEPR cap is set at its current value initially, then assumed to grow at the rate of inflation. The same caveat as in E applies concerning that assumption.

G: The figure used from each year in calculating HAPC. It is the minimum of the projected salary and the projected PEPR cap, each year.

H: HAPC, a three-year moving average of annual salaries (or the CCL from column E, whichever is lower).

*Items I and J pertain to the 2013 Tier*

I: (Pension) Benefit, the amount that would be paid out annually if the individual retires at age 65, based on service credit to date. The interpretation depends on age. Before age 65, the figure shown represents the pension at age 65 that would be paid if the individual separates from UC at the beginning of the year shown, delaying actual retirement until age 65. Since there is no inactive COLA, there is no need to adjust for inflation here. In any row, the figure in this column is the nominal pension that would be paid upon age-65 retirement, based on service to date, but of course its real value erodes with inflation between the current year and the year in which the individual turns 65. It can therefore be interpreted as the actual pension that would be received at age 65 if the individual leaves UC at the beginning of the plan year in question.

The age-65 calculation of course corresponds to separation and retirement occurring simultaneously.

The rows corresponding to ages greater than 65 show the increased pension from separating, but delaying retirement. This would presumably correspond to having another source of income, such as another job. This will be important when we discuss the interpretation for various defined-contribution balances below.

The constraint that service years cannot exceed 40 is imposed here by specifying that the figure shown is the minimum of HAPC and the product of HAPC, service credit, and the age factor. It would have been equivalent to simply cap service at 40 in the formula itself. For any rows where service would exceed 40, the service value is capped, but HAPC continues to grow with salary (or age factor, if the individual accumulated 40 years of service before turning 65), hence the pension will do so, as well. (This growth will be limited to growth in the PEPR cap, for pensions in the 2016 tier, unless the individual's salary remains below the PEPR cap that late in the career.)

J: Benefit55, the same as the previous item, except that it varies with the retirement age. For instance, if the retirement year is set between 55 and 65, the age factor will be reduced for the early-retirement penalty, and the figure shown for any row will be the reduced pension earned with service to date, assuming retirement at the age specified. Since the early-retirement penalty applies only for ages 55 to 64, cells I and J will show the same pension after age 65.

K: HAPC1 = HAPC recalculated taking the PEPR cap into account.

L: CBenefit = "capped" benefit; the same as column I except HAPC1 is used to calculate the benefit, so this figure applies for individuals in the 2016 Tier. It is the PEPR cap, not the CCL, that is binding.

M: CBenefit55 = "capped" benefit with adjusted retirement ages, analogous to column J.

As was the case for columns I and J, the figures for L and M coincide after age 65, and for later ages, they show the pension that is earned by delaying retirement.

N: This is the age factor that applies for retirement at the beginning of the plan year corresponding to each row. Note that figures are rounded to 3 decimal digits.

O: For an individual who chooses Savings Choice in the 2016 tier, this is the annual contribution to the DC plan from the employer and employee. The contributions apply to salaries up to the CCL.

P: Savings Choice Inc. Balance = the accumulated balance in the DC plan, at the beginning of each year.

Q: Annuitization: this figure is the annual income produced by an annuity purchased at the date of retirement, assumed to pay out annually until the year beginning with the final age specified in the program. For plan years preceding retirement, this amount would remain invested until retirement, for any individual leaving UC before retirement. The accumulated balance is assumed to grow at the interest rate specified on the home page, between separation and retirement, so the figures correspond to the benefit that would be available at retirement, for an individual who separates early from UC. The retirement age is specified in the program, and for that row, the annuity simply shows the retirement benefit when separation and retirement coincide.

*Subsequent values show the effects of waiting past the retirement age to purchase the annuity, with the same fixed end date. But there is no provision for reducing the accumulated DC balance to provide an income, in the interim.*

The blank column R separates Savings Choice from additional computations needed for Pension Choice, which begins in column S.

S: For the Pension Choice option in the 2016 Tier, there is an employee contribution of 7% paid when salaries exceed the PEPR cap. This column shows the annual contribution made on that basis. For staff, this column includes an additional supplement, the 3% employer contribution paid on salaries above the PEPR cap.

T: Analogous to column P in the Savings Choice computations, this column shows the accumulated balance from the above-PEPR contributions.

U: Analogous to column Q earlier, this column shows the annuity that can be purchased with the balance in column S, assuming again that it grows at the interest rate between the date of separation and the retirement date.

V, W, and X: these three columns are comparable to the three previous columns, for the other possible supplementary DC contributions under Pension Choice: for faculty and certain other employee categories, there is an employer contribution of 5% on all salary up to the CCL. V

shows the annual contribution, W the accumulated balance, and X the annuitized value. If the calculations pertain to staff, we simply replace the 5% with 0% and these columns can be ignored.

Y: This column shows the total annual benefit from Pension Choice: the sum of the pension (column M) and the two annuities (if present) in columns U and X.

Z: blank for formatting

AA: Column AA shows the column Y figure as a percentage of salary at retirement.

AB and AC show the same computations for the Savings Choice benefit from column Q and a Second Choice benefit still to be calculated (further to the right on the spreadsheet) from column AP.

AD is blank for formatting.

*The Second Choice benefit describes the projected experience for an individual who decides, in a year specified by the user, to switch from Savings Choice to Pension Choice.*

AE: Column K showed the projected HAPC for a Pension Choice participant, reflecting any reductions due to the PEPRA cap. That same HAPC applies following a second-choice decision to move from Savings Choice to Pension Choice. The program replaces this HAPC with zero values for the years spent in Savings Choice, and then for one more year, since without any service, HAPC is irrelevant. Treating service only in annual chunks, this individual would have no pension benefit until the second year after the choice to switch plans is actually made.

AF and AG: these columns correspond to I/J and L/M earlier, but with reduced service credit, since only years spent in Pension Choice count as service in calculating the benefit for a Second Choice option.

AH: The Second Choice participant will have accumulated a benefit from the years in Savings Choice. This column corresponds to the earlier column P, showing the accumulated balance, but only for the cells that correspond to years covered by Savings Choice. The figures differ for subsequent years, as there will be no new contributions, only earnings on the prior contributions.

AI: This is the annuitized value of the balance in AH. It is analogous to column Q earlier.

AJ, AK, and AL pertain to the above-PEPRA supplementary DC contributions; they are analogous to columns S, T, and U. Column S duplicates the information in AJ, but only after the change in plans has taken effect. If salary fails to exceed the PEPRA cap before the switch, there is only the Savings Choice benefit accompanying that salary and that year of service, not the supplement. Column AK is the accumulated balance, and AL is the annuitized value.

AM, AN, and AO are analogous to V, W, and X, but again, they apply only after the switch to Pension choice.

Column AP sums the four sources of pension income that apply for Second Choice: the new pension and annuities from columns AI, AL, and AO, plus the Savings Choice benefit from column AI.