Some observations about Salary Replacement with the 2016 Tier for UCRS

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This report applies the theory that I have developed over the past 8 months to show what should will be significant implications of the new Retirement Options.   The results are summarized in Table I for eligible faculty and Table II for staff and other academic employees.   These table show the expected percent salary replacement for various assumptions about years of service, investment growth during the payin to the DC components; Annuity yield during the payout (annuity growth); annual growth in pension payments (g_p); the ratio of final salary, S, to the PEPRA cap, P; number of years of payout; annual growth in salary; and the annual growth for the PEPRA cap.   The tables also show the expected salary return for the proposed DC plan and the present salary replacement for the 2013 Tier.

For all of the modeling, we assume that an individual retires at an age greater than 65, and that the annuity payout is 21 years which is the social security life expectancy of a 66 year old woman according to the social security administration. Further assumptions for all data in the table are that the assumed annual growth in salary is 4%, and that the annual growth in the PEPRA cap is 3% which is close to the historical growth in the maximum wages subject to FICA tax over the past 30 years.   In point #6 in the observations, there is some discussion about the effect of assuming a larger value for salary growth.

In the tables there are several lines for the years of service, 30, 35, and 40 years. They show the salary replacement for different S/P for the hybrid plan, the pure DC plan, and the 2013 Tier. The data in all of the columns except service credit (years) are expressed in percent and give the fraction of final (or highest average) compensation that an individual would receive during the first year of his or her retirement. If g_s is 0, then the payout from any DC contribution to the retirement plan will be the same for all years of payout. For larger g_s the pension payment will be larger in later years.   The scenarios also assume the employer and employee contributions that are specified in the proposal to the Regents.

The first line within each service credit group is in italics, and this case assumes that the investment yield during payin is 7.25% and that the annuity yield is 4.75%. The first number is consistent with the recent experience study for UCRS. Furthermore the annual growth in annuity payments is assumed to be zero. The other lines are for different assumptions about the investment yields and whether growth in annual benefits is built into the Defined Contribution plan. In all cases other sources of retirement income such as Social Security are ignored. Presently the values of S/P correspond to Salaries of $117K, $146K, $175K, $204K, $234K, and $263K. In future years he salary for a given S/P will increase because of inflation in P.

Some observations:

1.   For all cases the proposed DC plan is inferior to the hybrid plan for both faculty and staff for salary replacement after a long career. As it stands the plan would only be attractive to someone who wants to only stay for a few years at UC and take away his or her deferred compensation. The DC plan could be made more competitive by increasing the total

contribution of UC and the employee.   Since the salary replacement for a DC plan is directly proportional to the total contribution, the Tables provide the data that is necessary to improve the DC plan.

2. Faculty have larger salary replacement than staff for all of the DB plans.   In fact faculty with 40 years of service who have covered salary less than or equal to the PEPRA cap (probably a small number) will have pension payments that are 18 – 28% larger than their final salary!   Faculty with S/P near one would have more than 100% salary replacement for only 35 years of service. But for the standard investment and annuity yields all values of S/P will have more than 100% salary replacement after 40 years. This is not the case for lower investment yields.

3. Obviously staff with salaries less than or equal to the PEPRA cap have the same salary replacement for the 2013 tier. However salary replacement for the supplemental plan is far less than that of faculty for larger S/P.   This is primarily due to the absence of the 5% faculty DC contribution that starts at the first dollar.

4. Assuming that the pension payments grow 2% per year will also decrease salary replacement. For example using the first and second lines in the faculty 40 service credit group, the drop in salary replacement is 4 percentage points for S/P = 1, but 10 percentage points for S/P = 2.25.

5. The salary replacement is also smaller if the investment yields for payin and payout are smaller. This is indicated for third and fourth lines in each service credit group. For the largest S/P this can decrease the salary replacement (for standard parameters) by 17 percentage points for 40 years of service.   The tables show that the assumption of lower yields greatly clobbers the pure DC salary replacement. This drop in the DC contribution is what lowers the hybrid plan salary replacement.

6. Although results are only shown here for assumed salary growth of 4%, it turns out that somewhat paradoxically the salary replacement actually decreases for larger salary growth. The reason is that although the higher salaries provide more contribution to DC, the contributions have less time to accumulate compounded growth.

The parameter space for the modeling is rather vast, but if there is interest more scenarios can be explored.   However the results in this report provide insight into the significant consequences of the new retirement plan.

Table I, Salary Replacement for Eligible Faculty

n / years	Payin Yield	Annuity yield	g_p	Ratio of	S to P					DC plan	2013 Tier
				1.0	1.25	1.5	1.75	2.0	2.25		
30	*7.25*	*4.75*	*0*	*93*	*81*	*79*	*78*	*77*	*76*	*53*	*75*
30	7.25	4.75	2	90	78	74	72	71	69	45	75
30	6.25	3.75	0	89	77	73	70	69	67	42	75
30	6.25	3.75	2	87	74	69	66	63	62	35	75
35	*7.25*	*4.75*	*0*	*110*	*96*	*93*	*93*	*93*	*92*	*68*	*88*
35	7.25	4.75	2	107	92	88	86	85	84	57	88
35	6.25	3.75	0	105	90	85	83	81	80	52	88
35	6.25	3.75	2	102	87	81	78	75	73	43	88
40	*7.25*	*4.75*	*0*	*128*	*112*	*108*	*109*	*109*	*110*	*85*	*100*
40	7.25	4.75	2	124	107	101	101	100	100	72	100
40	6.25	3.75	0	121	104	98	96	94	93	63	100
40	6.25	3.75	2	118	100	93	89	87	85	53	100

Table II, Salary Replacement for Staff

n / years	Payin Yield	Annuity yield	g_p	Ratio of	S to P					DC plan	2013 Tier
				1.0	1.25	1.5	1.75	2.0	2.25		
30	*7.25*	*4.75*	*0*	*75*	*64*	*63*	*63*	*63*	*63*	*53*	*75*
30	7.25	4.75	2	75	63	61	60	59	59	45	75
30	6.25	3.75	0	75	63	61	59	58	57	42	75
30	6.25	3.75	2	75	63	59	56	55	53	35	75
35	*7.25*	*4.75*	*0*	*88*	*74*	*73*	*74*	*75*	*76*	*68*	*88*
35	7.25	4.75	2	88	73	71	70	70	70	57	88
35	6.25	3.75	0	88	73	70	69	68	67	52	88
35	6.25	3.75	2	88	73	68	66	64	63	43	88
40	*7.25*	*4.75*	*0*	*100*	*84*	*82*	*85*	*87*	*89*	*85*	*100*
40	7.25	4.75	2	100	83	80	81	81	82	72	100
40	6.25	3.75	0	100	83	79	78	78	78	63	100
40	6.25	3.75	2	100	83	77	75	73	72	53	100