TIAA-CREF institute

TIAA-CREF asset management®

What's Your Number?

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HOW DO WE MEASURE ADEQUACY OR SUCCESS IN RETIREMENT PLANNING?

- Effective Household retirement planning requires having well defined objectives and tools for meeting those objectives.
- Households need to have an idea of
  - The replacement rate (net of Social Security) needed to achieve their retirement lifestyle objectives.
  - The assets needed to fund income for retirement consumption.
  - How to reach their target retirement assets and replacement rates.
- Households have 4 tools for hitting their targets
  1. Retirement savings contributions
  2. Retirement plan asset allocation (rate of returns)
  3. Date of Retirement
  4. Retirement Choices

2 CENTRAL QUESTIONS

1. What sort of feedback can we provide so that individuals can estimate whether they are in the retirement savings ballpark?
   - Needs to be simple and transparent in order to gain acceptance and widespread usage.
2. What can be done to structure or constrain decision-making in order to promote retirement income adequacy?
   - Any such program would need to create an appropriate balance between individual choice and program constraints.

MEASURING ADEQUCY OR SUCCESS OVER THE LIFE CYCLE

- *Funding Ratio*: measures the adequacy of current DB plan assets to future liabilities.

$$FR_t = \frac{Assets_t}{PV\ Future\ Liabilities_t} \geq 1$$

- *Asset-Salary Ratio:* measures the adequacy of DC plan assets to hit a threshold replacement rate at retirement.

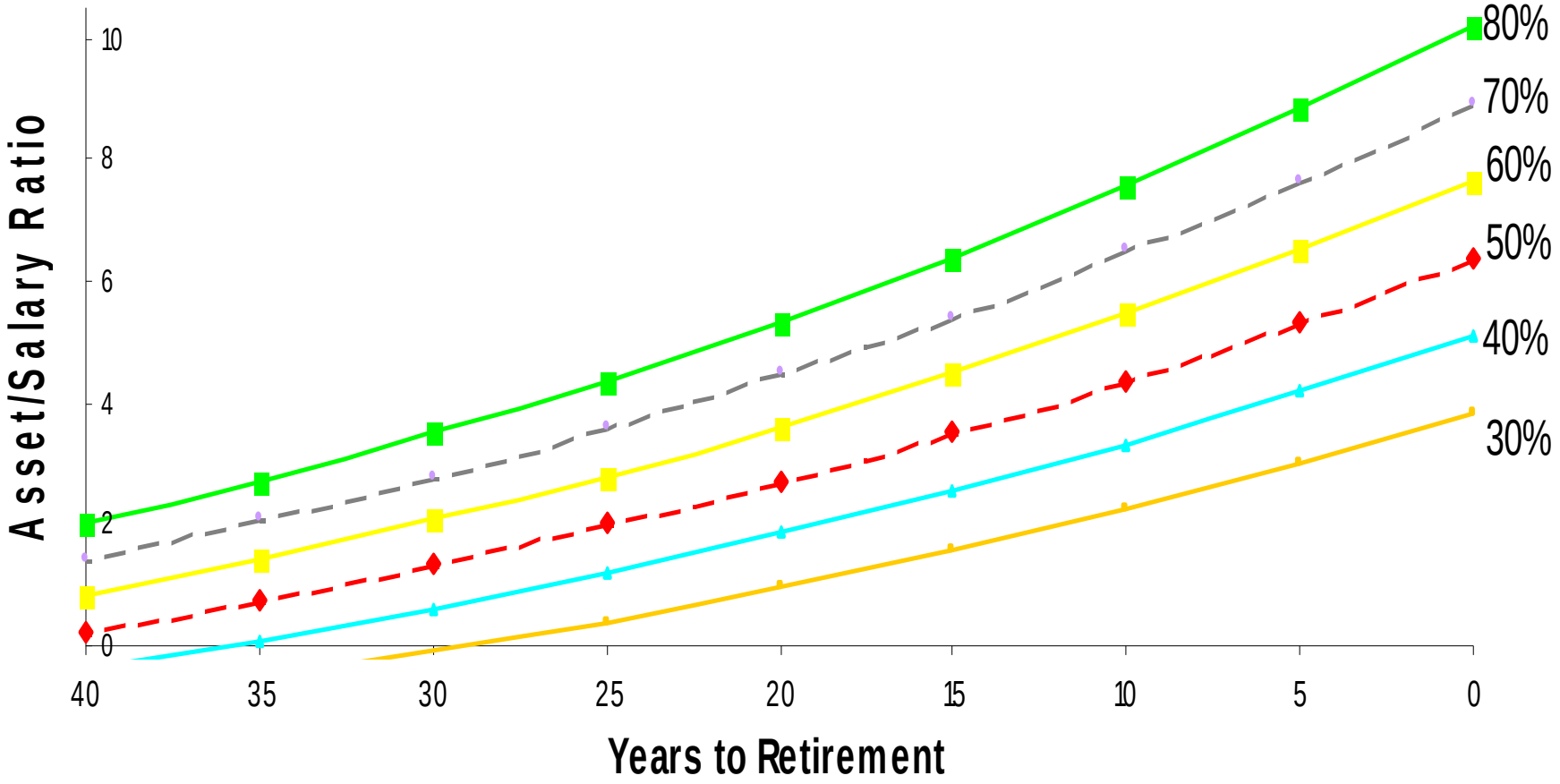
$$ASR_t = \frac{A_t}{S_t} \geq ?$$

COMPONENTS OF THE ASR

- Target Replacement Rate
- Current Salary
- Current Assets
- Assumptions re:
  - Future salary growth
  - Rates of Return
  - Discount Rate
  - Years in Retirement
  - Estate Planning Objectives

"PAR" ASSET/SALARY RATIO BY TARGET REPLACEMENT RATE

6% Asset Returns, 25-Year Annuity @ 6%, 4% Nominal Salary Growth, 10% Contribution Rate



THE ASR IN PRACTICE

- Sample:
  - About 68,400 participants at 71 institutions
  - 2007 Cross-sectional Data
- Detailed Data on
  - Contributions (size and type)
  - Asset Allocation
  - Age
  - Retirement system tenure
  - Gender
  - Location

SAMPLE STATISTICS

Variable	Mean	St. Dev.
Age	48.6	10.8
Tenure	12.8	9
Total Assets	$321,989	$385,227
Total Contributions	$12,178	$10,111
Contribution Rate	16.9%	14.1%
Salary	73,158	49,992
Asset-Salary Ratio	2.8	10.3

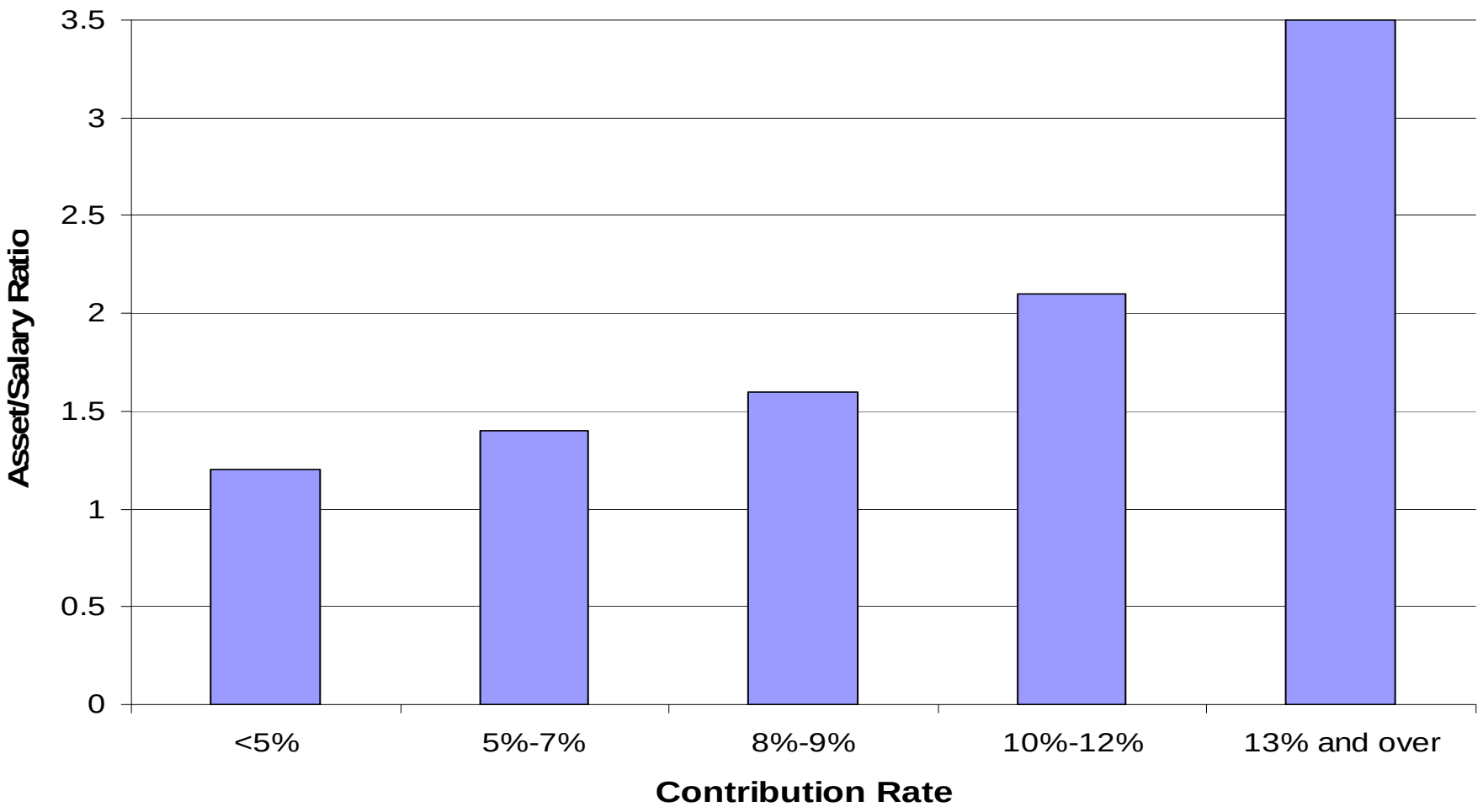
AGE COHORT

TABLE 2: FREQUENCY DISTRIBUTIONS BY AGE-GROUPS

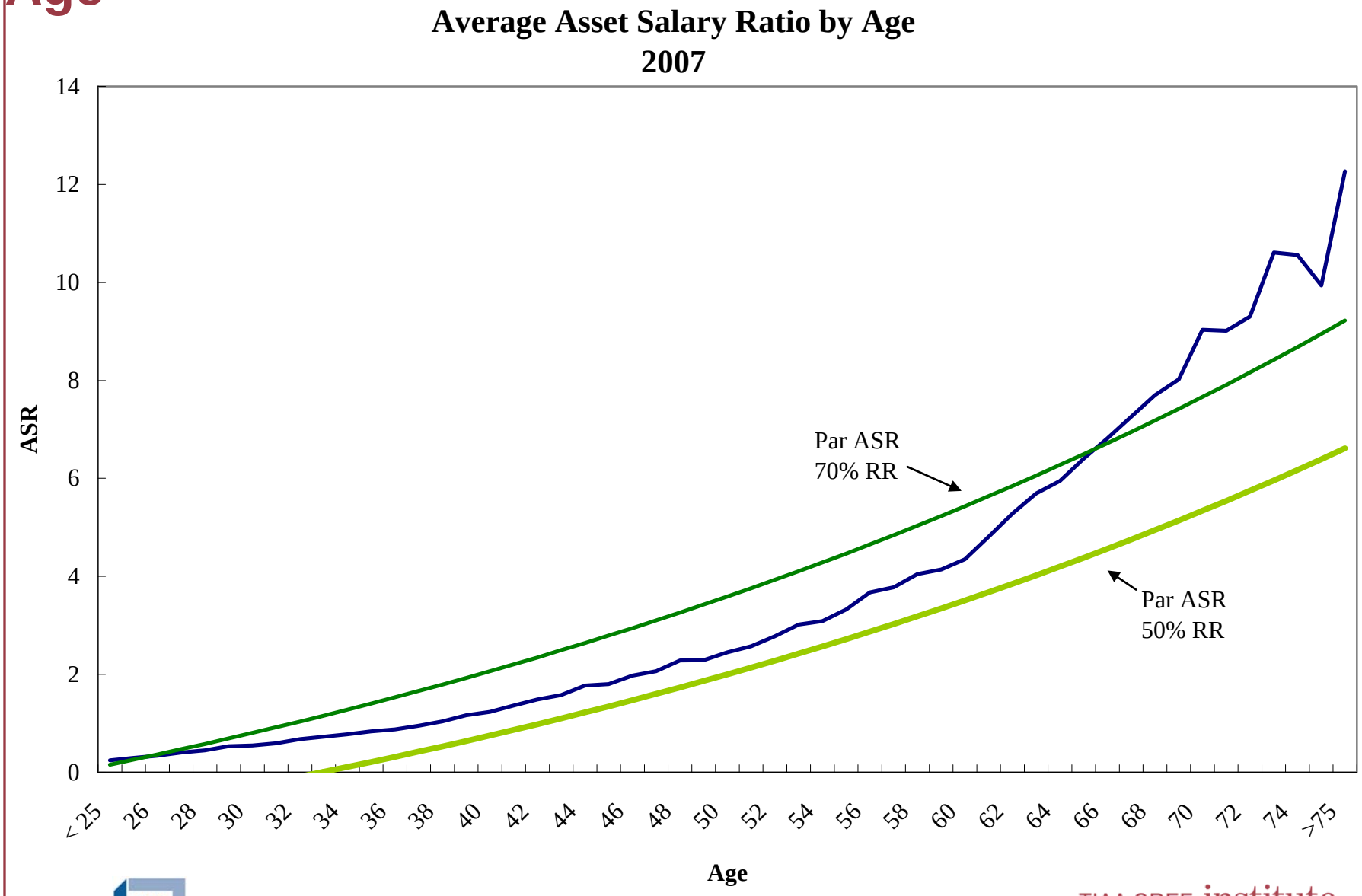
AGE	N	Average Contributions	Average Assets	Average Tenure	Average Salary	Average ASR
under 25	320	3,999	6,562	1.8	29,922	0.2
25-34	7,877	6,796	26,506	4.1	48,431	0.6
35-44	17,590	9,791	77,011	8.0	64,625	1.3
45-54	21,589	12,356	180,402	13.2	75,259	2.5
55-64	17,087	15,414	371,162	18.7	85,515	4.5
65-74	3,613	19,096	765,318	25.2	98,842	8.7
75-84	291	21,767	1,216,903	31.5	103,715	18.8
over 85	6	14,641	1,198,079	21.7	66,636	13.5

source: author calculations

CONTRIBUTION RATES



Age



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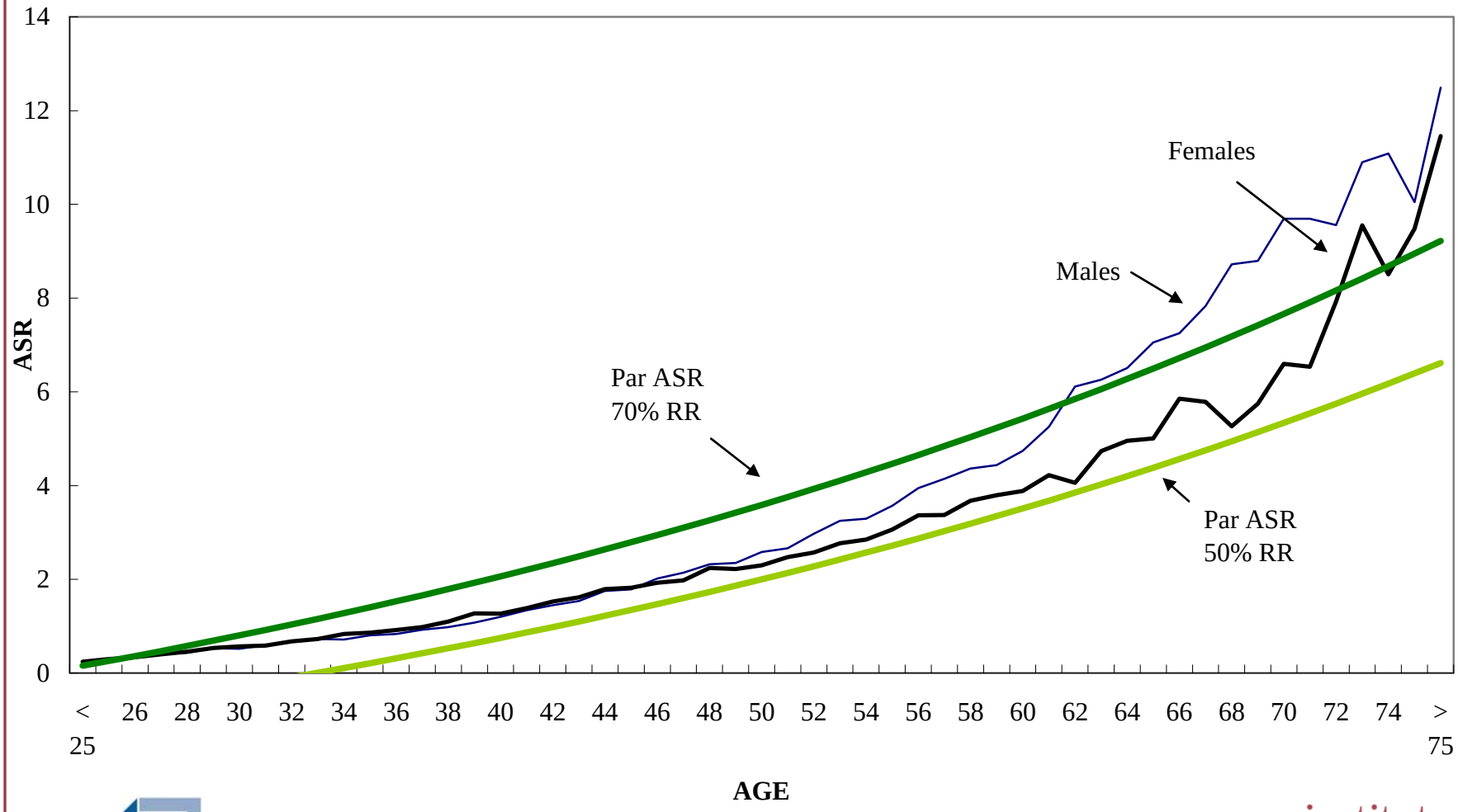
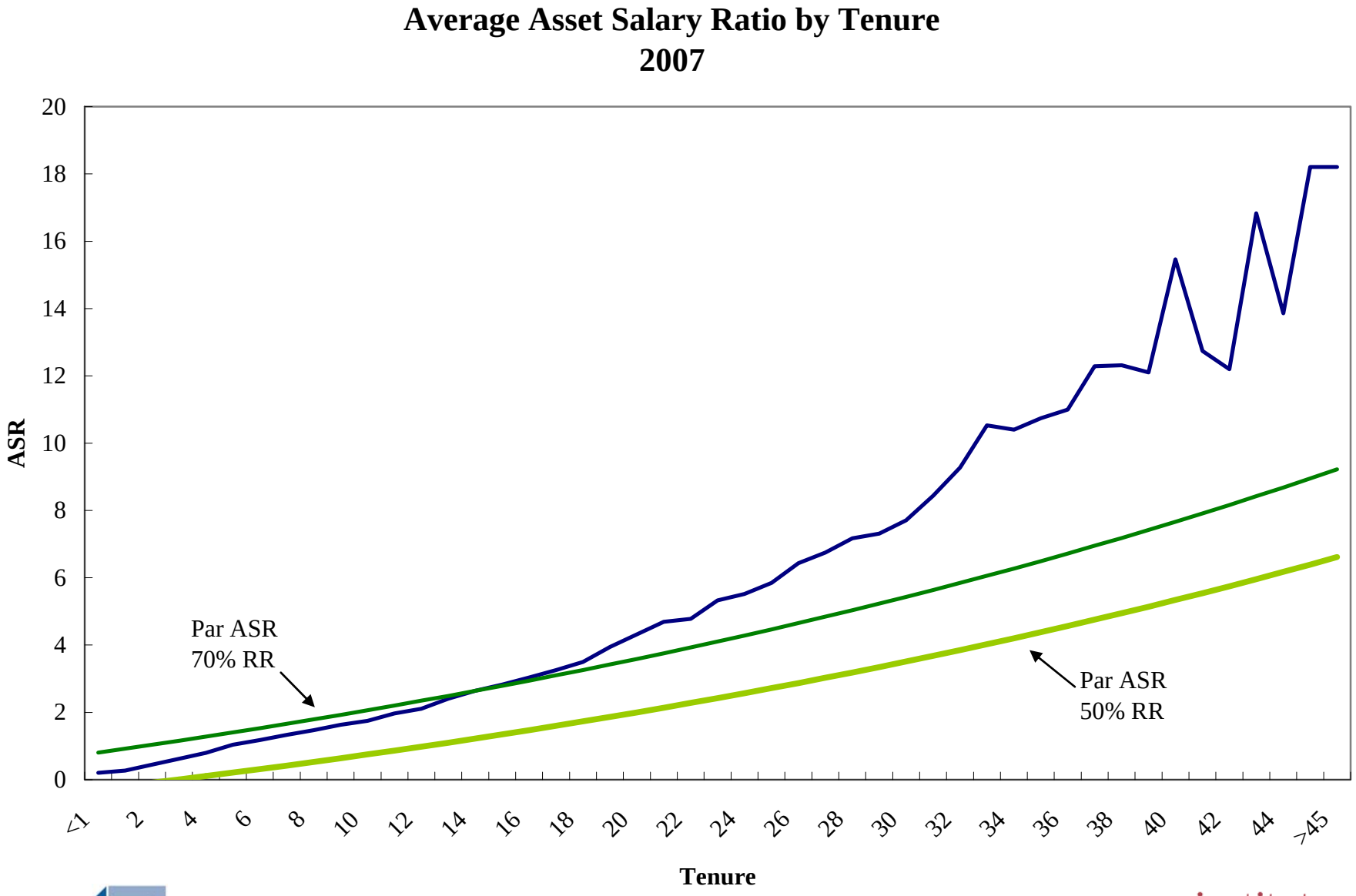
Age and Gender

Average ASR by Age and Gender
2007



Tenure



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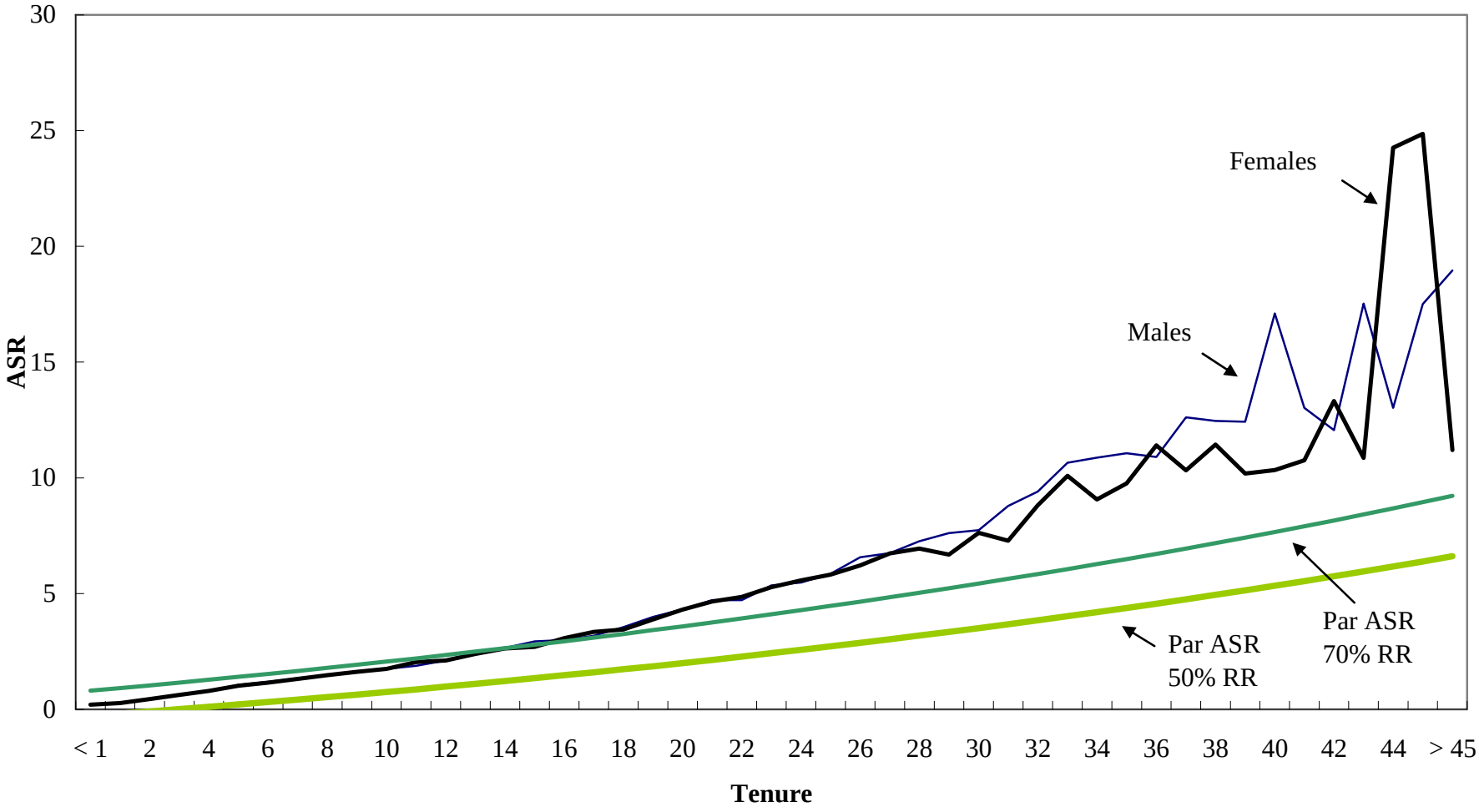
Tenure and Gender

Average Asset Salary Ratios by Tenure and Gender
2007



SALARY BANDS

TABLE 4. FREQUENCY DISTRIBUTIONS BY SALARY

Salary	N	Average Age	Average Contributions	Average Assets	Average Tenure	Average ASR
less than $40,000	15,473	45	4,738	62,202	8.9	2.8
$40,000-$59,999	17,158	46	8,183	107,742	10.5	2.1
$60,000-$79,999	13,974	49	11,625	183,766	13.0	2.6
$80,000-$99,999	8,663	52	15,395	304,534	15.9	3.4
$100,000-$119,999	4,741	53	18,851	401,485	17.5	3.7
more than $120,000	8,364	55	27,937	598,758	18.9	3.6

source: author calculations

WHAT FACTORS AFFECT THE ASR?

TABLE 8. OLS ANALYSIS OF ASSET-SALARY RATIO

Dependent Variable: ln (Asset-Salary Ratio) *lnASR*

Root MSE	0.4417		R-Square	0.8251
Dependent Mean	0.5996		Adj R-Sq	0.8251
Coeff Var	73.6691			

Variable	Parameter Estimate	Standard Error	t Value	Pr > |t|
Intercept	-0.158	0.044	-3.59	0.0003
Age	0.012	0.002	6.48	<.0001
Age squared	0.000	0.000	-0.65	0.5153
Tenure	0.153	0.001	161.31	<.0001
Tenure squared	-0.002	0.000	-81.12	<.0001
dFemale	0.031	0.008	4.15	<.0001
ln (TC percent)	0.748	0.005	142.36	<.0001
ln (Eq percent)	0.051	0.003	16.55	<.0001
ln (TIAA percent)	0.007	0.002	2.79	0.0052
dRAemployee	0.076	0.005	15.97	<.0001
dSRAemployee	0.254	0.022	11.49	<.0001
tenure*dFemale	-0.003	0.000	-6.89	<.0001
age*dSRAemployee	-0.006	0.000	-14.83	<.0001

source: author calculations

WHAT IS IMPORTANT FOR REACHING A THRESHOLD ASR?

TABLE 9. ORDERED PROBIT ANALYSIS OF THRESHOLD ASSET-SALARY RATIOS

Dependent Variable: *Threshold ASR*

Log likelihood	-50,951			
Variable	Parameter Estimate	Standard Error	Chi-Square	Pr > ChiSq
Intercept	11.092	0.131	7,202.3	<.0001
Intercept 2	0.629	0.008	6,187.0	<.0001
Intercept 3	1.480	0.011	19,365.9	<.0001
Intercept 4	2.522	0.013	37,857.4	<.0001
Age	-0.411	0.006	5,513.5	<.0001
Age squared	0.003	0.000	2,455.9	<.0001
Tenure	0.286	0.003	7,826.1	<.0001
Tenure squared	-0.002	0.000	850.4	<.0001
dFemale	0.091	0.022	17.4	<.0001
ln (TC percent)	1.658	0.017	9,909.0	<.0001
ln (Eq percent)	0.156	0.008	347.3	<.0001
ln (TIAA percent)	0.038	0.006	37.1	<.0001
dRAemployee	0.180	0.013	189.9	<.0001
dSRAemployee	0.290	0.057	25.7	<.0001
tenure*dFemale	-0.009	0.001	42.6	<.0001
age*dSRAemployee	-0.008	0.001	49.2	<.0001

source: author calculations

CONCLUDING THOUGHTS

- As of 2007, these TIAA-CREF participants were, on average, more than adequately funded for retirement
- Two Biggest Factors for achieving retirement adequacy:
  - Early and long participation in a retirement plan
  - High contribution rates
- A Portfolio tilted to equities increases the likelihood of success but not as much as an adequate contribution rate or long tenure.
- Catch-up contributions are very important to some older participants retirement adequacy goals.
- Plans that encourage early participation and provide strong incentives for increased employee contributions increase the likelihood of participant retirement savings adequacy.