

## **Actuarial Modeling Results**

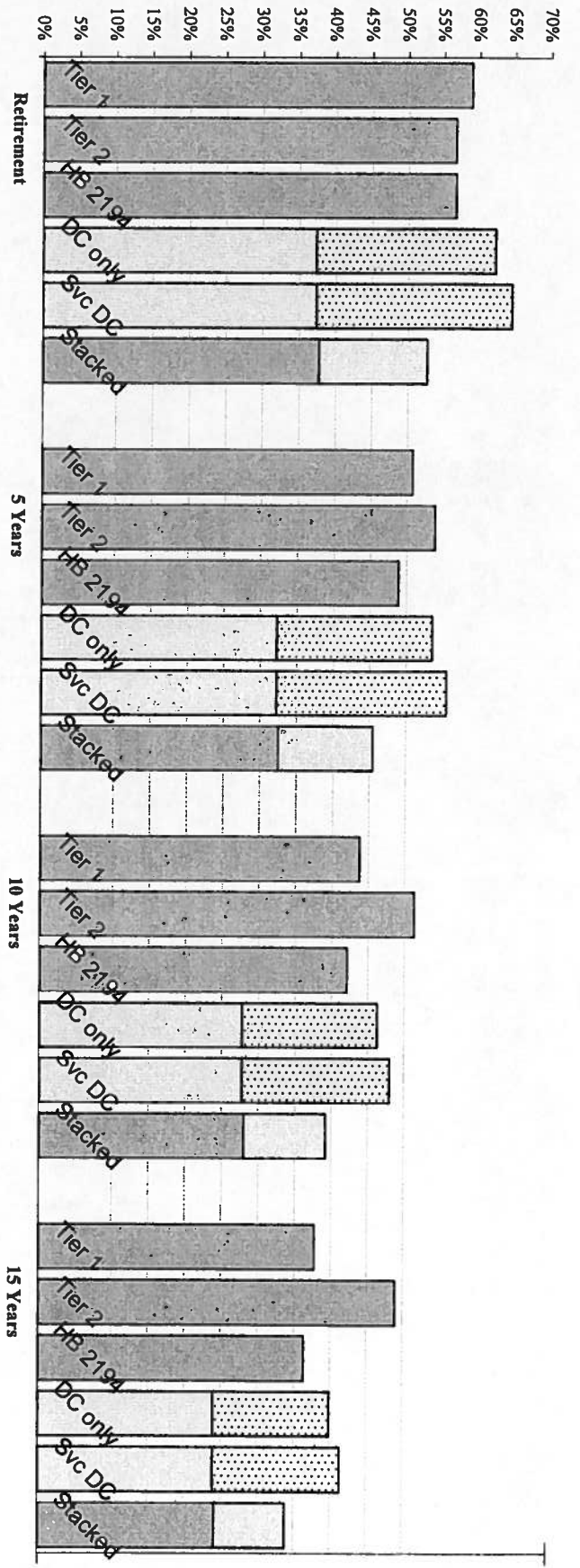
**Stacked Hybrid and Defined Contribution Examples #1 – #25**

**Prepared for the KPERS Study Commission**

**Cavanaugh Macdonald Consulting, LLC**

**November 8, 2011**

### Replacement % through time



- DB Plan
- EE DC
- ER DC
- Cash Bal
- Social Security

0 0 for rate in box, 1 for selection

Display Controls

Retire at age:	65	DC returns pre-ret:	8.00%
Service:	35	DC returns post-ret:	6.00%
Quit at age:	65	DC COLA:	0.0%

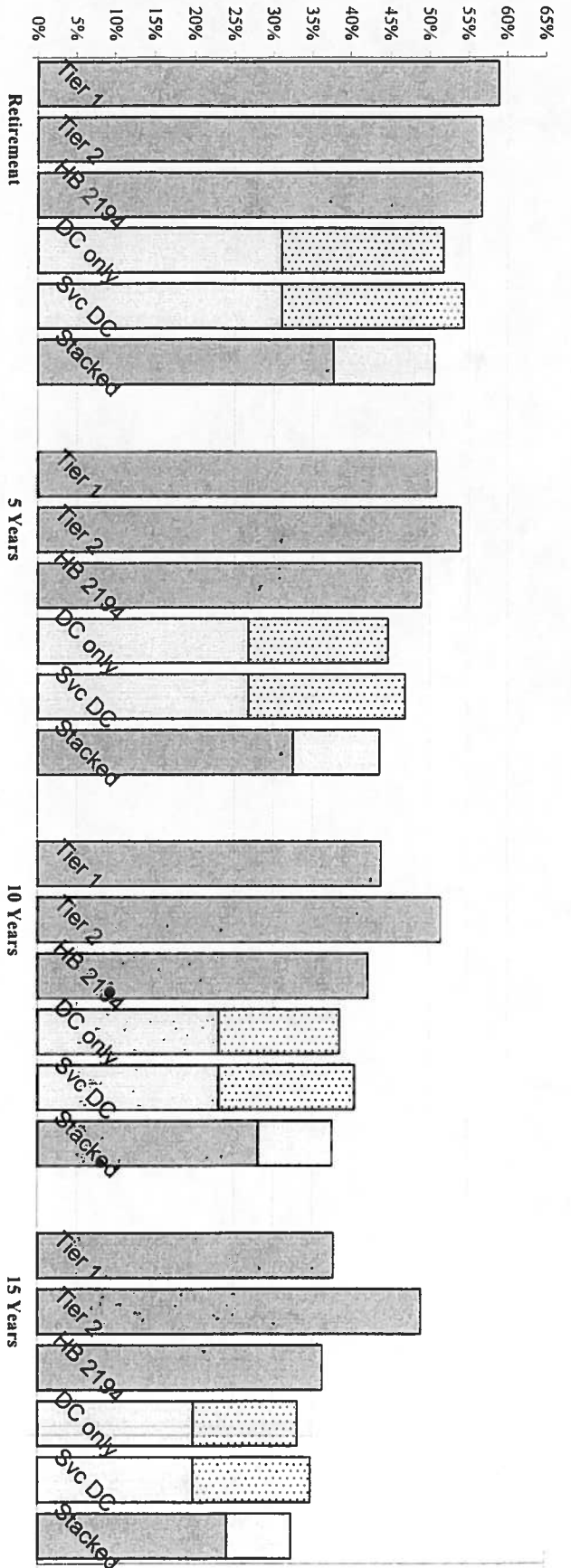
  

Salary increases:	School	Cash Bal pay credit:	8.00%
Current Salary:	\$30,000	Cash Bal interest credit:	6.00%
CPI:	3.0%	Cash Bal Conversion:	5.00%
Current Age:	30	Stacked limit:	\$31,000
Current Service:	0	Stacked index:	4.00%
		Contribution over cap:	4.00%

DC is 6% ee, 4% er  
 Svc DC grades to 5.75%, 4% er cost, 6% ee

# 1

### Replacement % through time



- DDB Plan
- EE DC
- ER DC
- Cash Bal
- Social Security

0 0 for rate in box, 1 for selection

Display Controls

Retire at age: 65  
 Service: 35  
 Quit at age: 65

Salary increases:  
 Current Salary: \$30,000  
 CPI: 3.0%  
 Current Age: 30  
 Current Service: 0

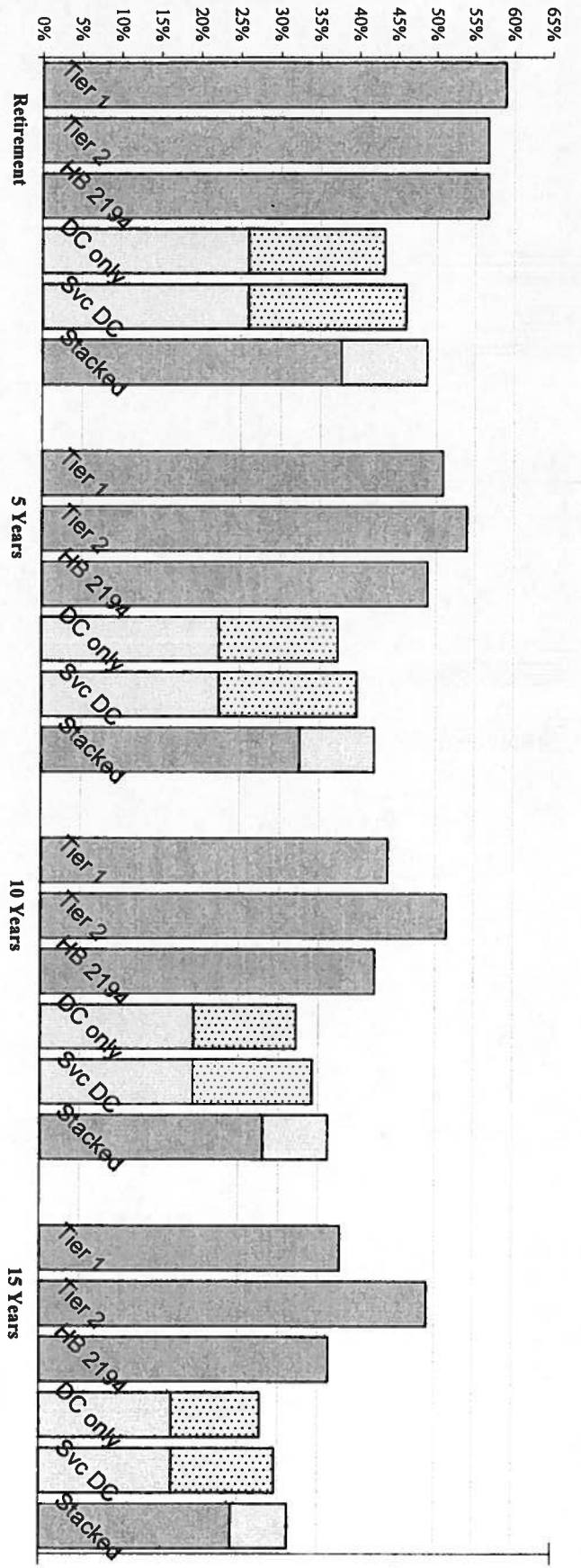
DC returns pre-ret: 7.00%  
 DC returns post-ret: 6.00%  
 DC COLA: 0.0%

Cash Bal pay credit: 8.00%  
 Cash Bal interest credit: 6.00%  
 Cash Bal Conversion: 5.00%

Stacked limit: \$31,000  
 Stacked Index: 4.00%  
 Contribution over cap: 4.00%

DC is 6% ee, 4% er  
 Svc DC grades to 5.75%, 4% er cost, 6% ee

### Replacement % through time



- DB Plan
- BE DC
- ER DC
- Cash Bal
- Social Security

0 0 for rate in box, 1 for selection

Display Controls

Retire at age:	65	DC returns pre-ret:	6.00%
Service:	35	DC returns post-ret:	6.00%
Quit at age:	65	DC COLA:	0.00%

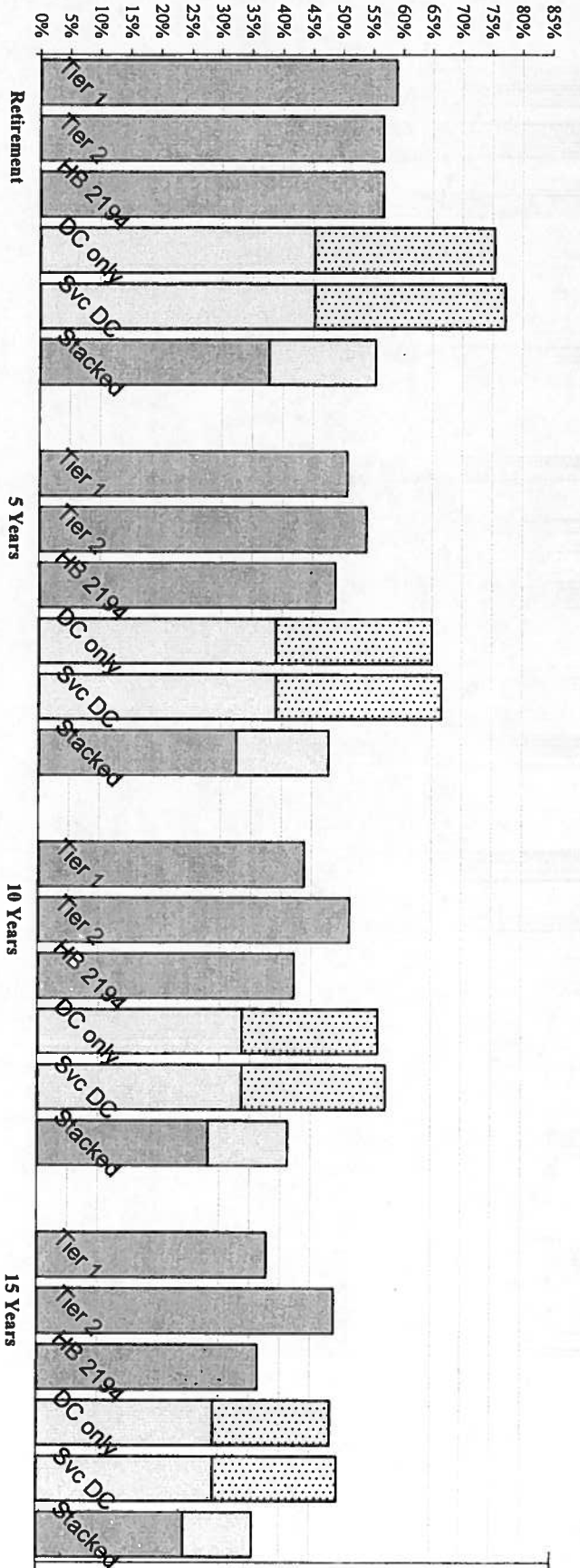
  

Salary increases:	School	Cash Bal pay credit:	8.00%
Current Salary:	\$30,000	Cash Bal interest credit:	6.00%
CPI:	3.0%	Cash Bal Conversion:	5.00%
Current Age:	30	Stacked limit:	\$31,000
Current Service:	0	Stacked index:	4.00%
		Contribution over cap:	4.00%

DC is 6% ee, 4% er  
 Svc DC grades to 5.75%, 4% er cost, 6% ee

#3

### Replacement % through time



- DDB Plan
- DEE DC
- DER DC
- Cash Bal
- Social Security

0 0 for rate in box, 1 for selection

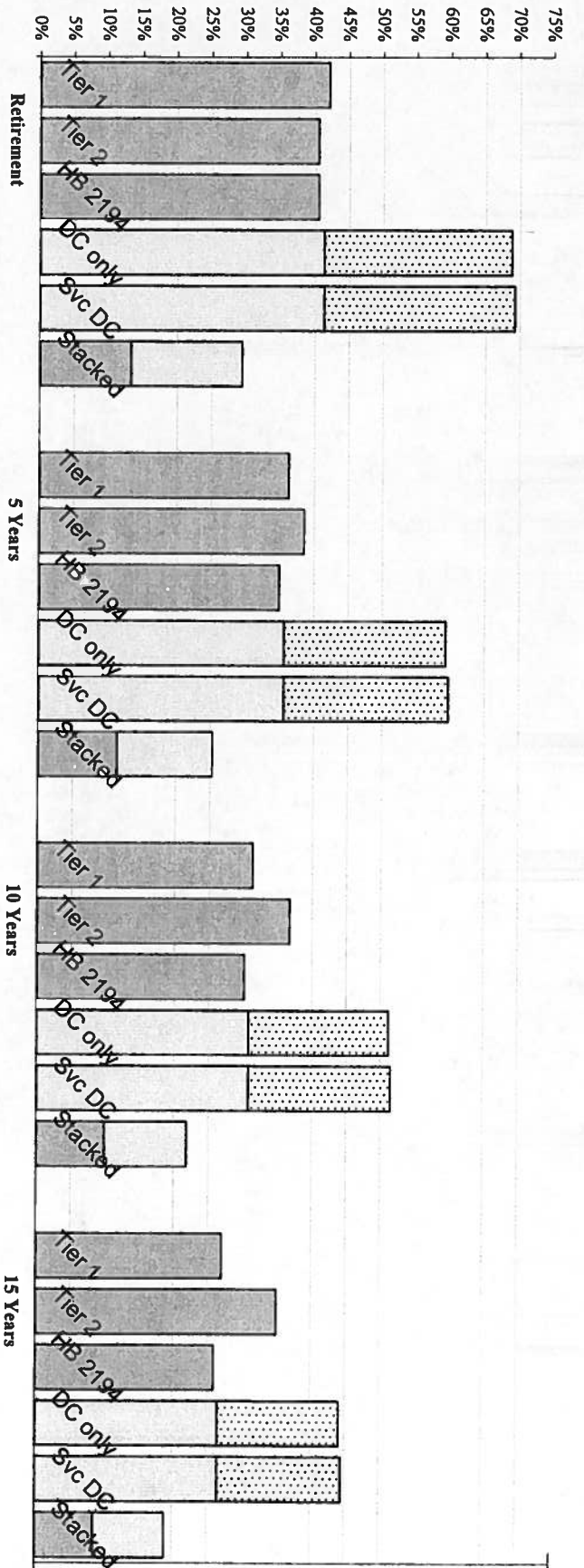
Display Controls

Retire at age:	65	DC returns pre-ret:	9.00%
Service:	35	DC returns post-ret:	6.00%
Quit at age:	65	DC COLA:	0.00%
Salary increases:	School	Cash Bal pay credit:	8.00%
Current Salary:	\$30,000	Cash Bal interest credit:	6.00%
CPI:	3.0%	Cash Bal Conversion:	5.00%
Current Age:	30	Stacked limit:	\$31,000
Current Service:	0	Stacked index:	4.00%
		Contribution over cap:	4.00%

DC is 6% ee, 4% er  
Svc DC grades to 5.75%, 4% er cost, 6% ee

#4

### Replacement % through time



- DB Plan
- EE DC
- ER DC
- Cash Bal
- Social Security

0 0 for rate in box, 1 for selection

Display Controls

Retire at age:	65	DC returns pre-ret:	8.00%
Service:	25	DC returns post-ret:	6.00%
Quit at age:	47	DC COLA:	0.00%

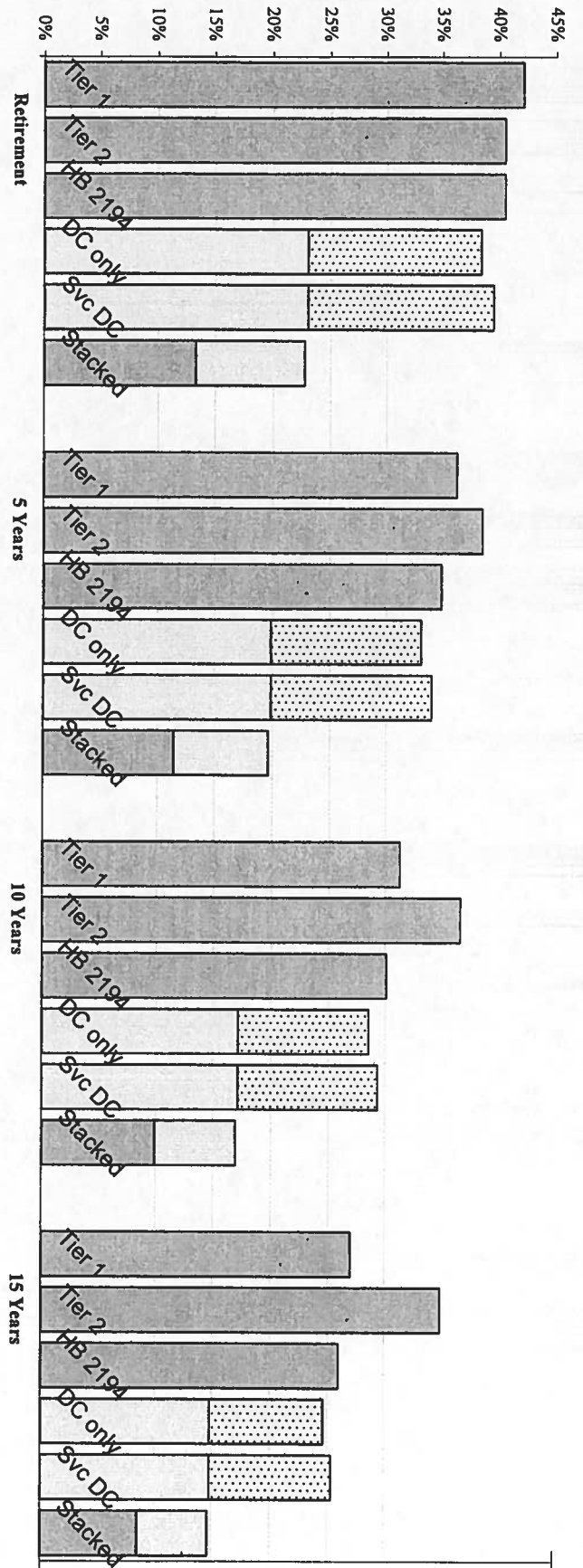
  

Salary increases:	School	Cash Bal pay credit:	8.00%
Current Salary:	\$30,000	Cash Bal interest credit:	6.00%
CPI:	3.0%	Cash Bal Conversion:	5.00%
Current Age:	22	Stacked limit:	\$31,000
Current Service:	0	Stacked index:	4.00%
		Contribution over cap:	4.00%

DC is 6% ee, 4% er  
 Svc DC grades to 5.75%, 4% er cost, 6% ee

#5

### Replacement % through time



- DDB Plan
- DEE DC
- DER DC
- Cash Bal
- Social Security

0 0 for rate in box, 1 for selection

Display Controls

Retire at age: 65  
 Service: 25  
 Quit at age: 47

DC returns pre-ret: 6.00%  
 DC returns post-ret: 6.00%  
 DC COLA: 0.00%

Cash Bal pay credit: 8.00%  
 Cash Bal interest credit: 6.00%  
 Cash Bal Conversion: 5.00%

Stacked limit: \$31,000  
 Stacked index: 4.00%  
 Contribution over cap: 4.00%

DC is 6% ee, 4% er  
 Svc DC grades to 5.75%, 4% er cost, 6% ee

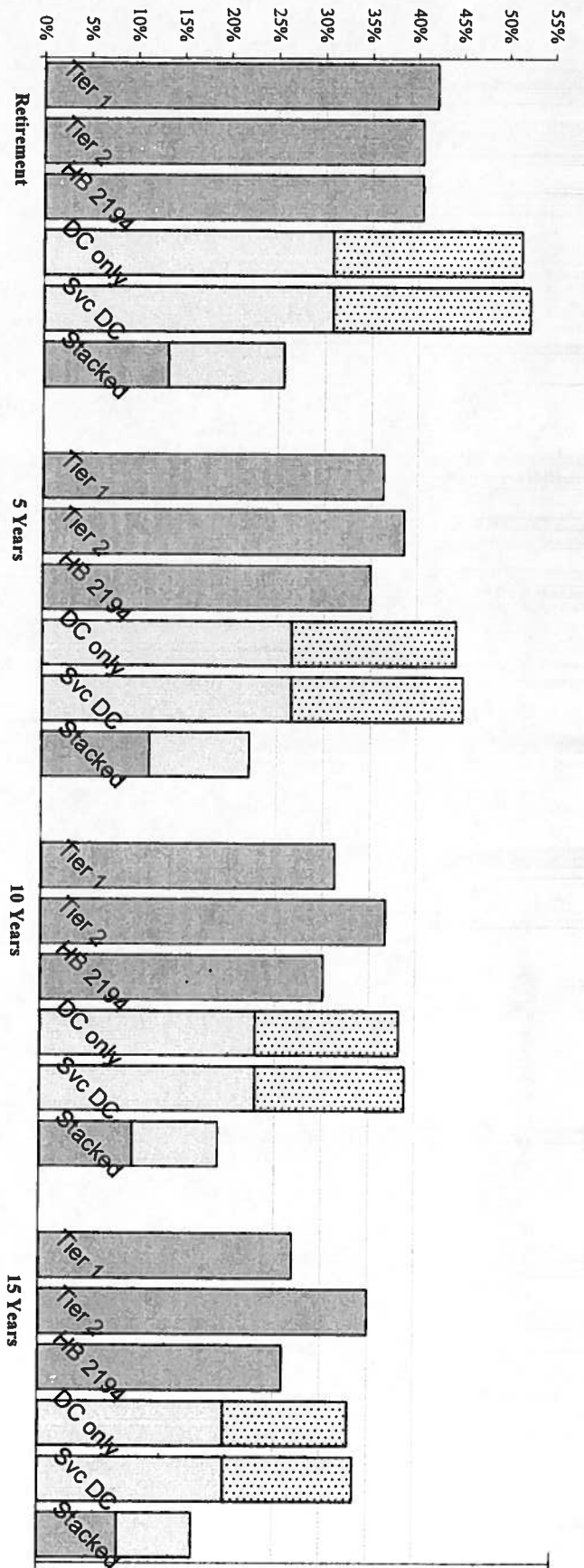
Salary increases:  
 Current Salary: \$30,000  
 CPI: 3.0%  
 Current Age: 22  
 Current Service: 0

School  
 Current Salary: \$30,000  
 CPI: 3.0%  
 Current Age: 22  
 Current Service: 0

Stacked limit: \$31,000  
 Stacked index: 4.00%  
 Contribution over cap: 4.00%

#6

### Replacement % through time



- DDB Plan
- EE DC
- ER DC
- Cash Bal
- Social Security

0 0 for rate in box, 1 for selection

Display Controls

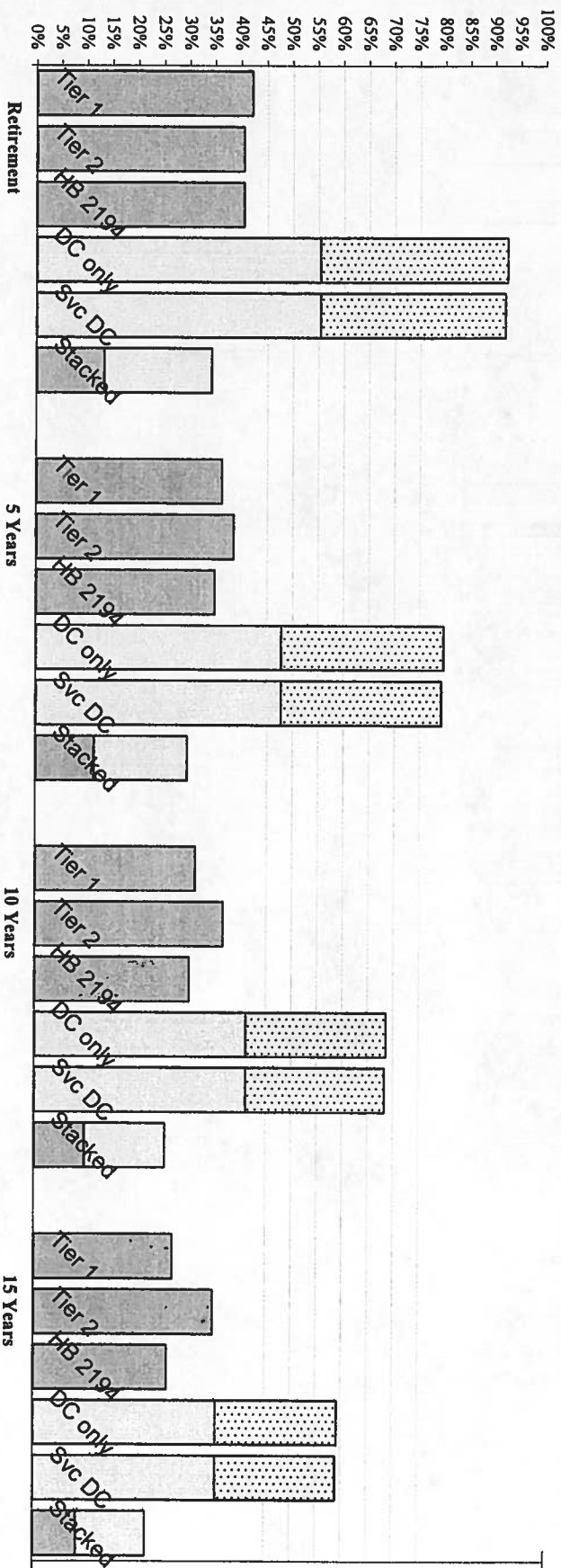
Retire at age:	65	DC returns pre-ret:	7.00%
Service:	25	DC returns post-ret:	6.00%
Quit at age:	47	DC COLA:	0.00%
Salary Increases:		Cash Bal pay credit:	8.00%
Current Salary:	\$30,000	Cash Bal interest credit:	6.00%
CPI:	3.0%	Cash Bal Conversion:	5.00%
Current Age:	22	Stacked limit:	\$31,000
Current Service:	0	Stacked index:	4.00%
		Contribution over cap:	4.00%

DC is 6% ee, 4% er  
Svc DC grades to 5.75%, 4% er cost, 6% ee

#7



### Replacement % through time



- DB Plan
- DBE DC
- DBR DC
- Cash Bal
- Social Security

0 0 for rate in box, 1 for selection

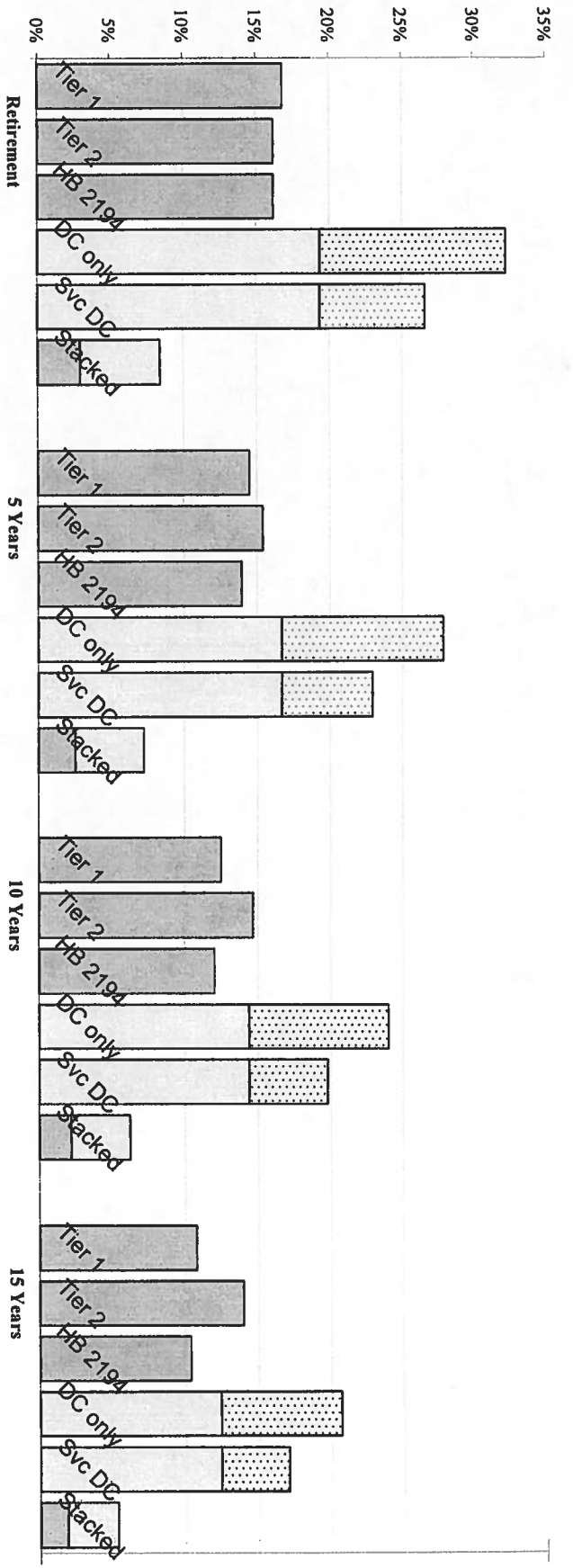
Display Controls

Retire at age:	65	DC returns pre-ret:	9.00%
Service:	25	DC returns post-ret:	6.00%
Quit at age:	47	DC COLA:	0.00%
Salary increases:		Cash Bal pay credit:	8.00%
Current Salary:	\$30,000	Cash Bal interest credit:	6.00%
CPI:	3.0%	Cash Bal Conversion:	5.00%
Current Age:	22	Stacked limit:	\$31,000
Current Service:	0	Stacked Index:	4.00%
		Contribution over cap:	4.00%

DC is 6% ee, 4% er  
Svc DC grades to 5.75%, 4% er cost, 6% ee

#8

### Replacement % through time



- DB Plan
- EEF DC
- ER DC
- Cash Bal
- Social Security

0 0 for rate in box, 1 for selection

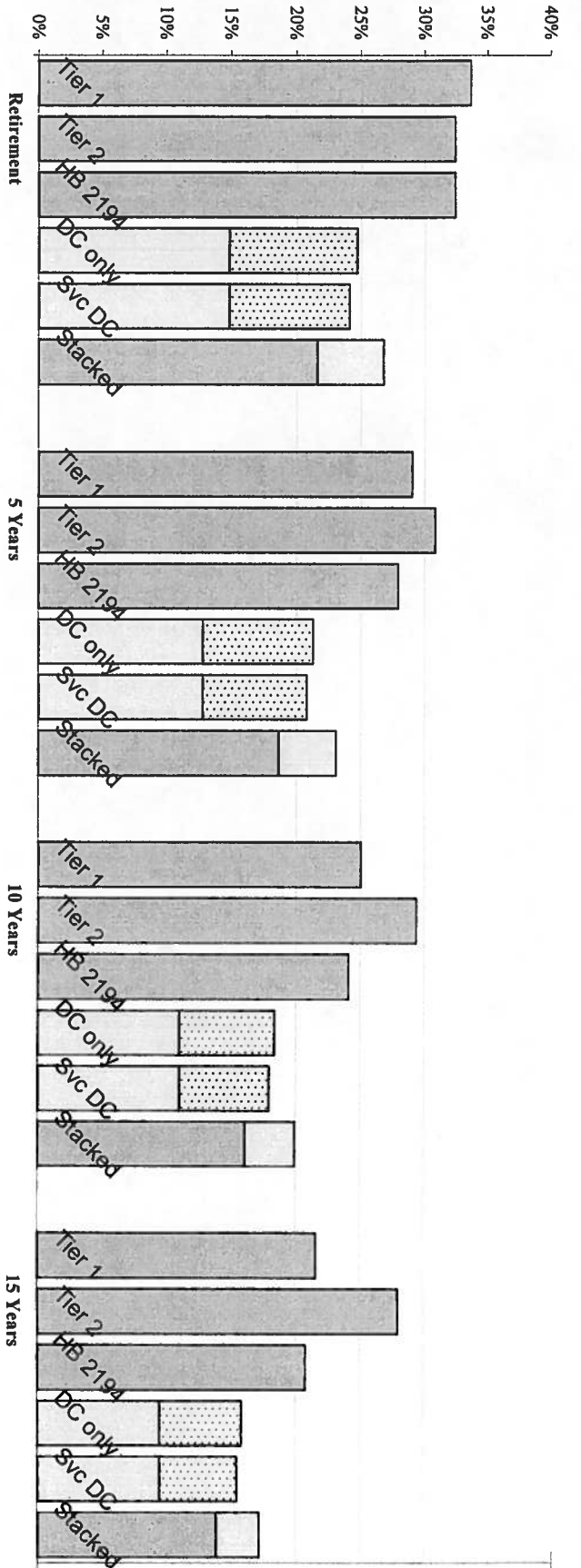
Display Controls

Retire at age:	65	DC returns pre-ret:	8.00%
Service:	10	DC returns post-ret:	6.00%
Quit at age:	32	DC COLA:	0.00%
Salary increases:		Cash Bal pay credit:	8.00%
Current Salary:	\$30,000	Cash Bal interest credit:	6.00%
CPI:	3.0%	Cash Bal Conversion:	5.00%
Current Age:	22	Stacked limit:	\$31,000
Current Service:	0	Stacked index:	4.00%
		Contribution over cap:	4.00%

DC is 6% ee, 4% er  
 Svc DC grades to 5.75%, 4% er cost, 6% ee

#9

Replacement % through time



- DDB Plan
- DEE DC
- DER DC
- Cash Bal
- Social Security

0 0 for rate in box, 1 for selection

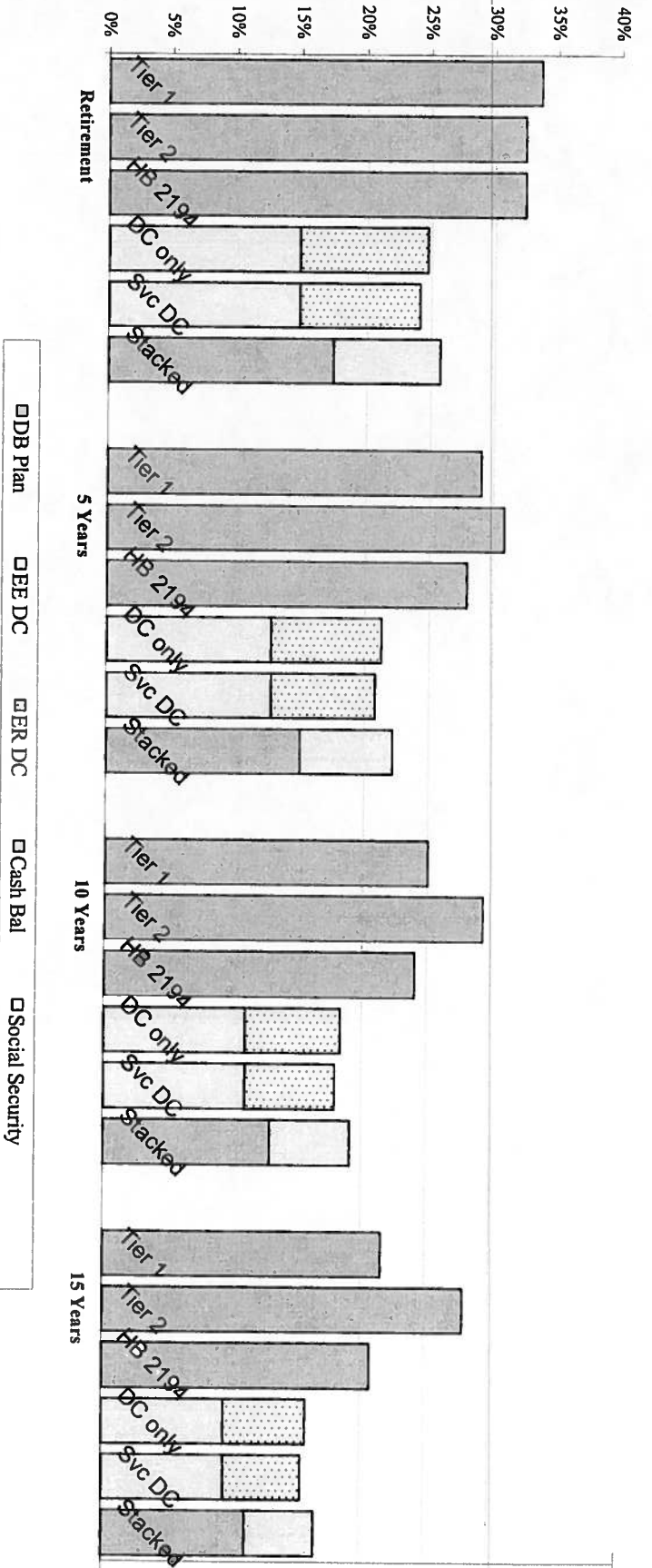
Display Controls

Retire at age:	65	DC returns pre-ret:	8.00%
Service:	20	DC returns post-ret:	6.00%
Quit at age:	65	DC COLA:	0.0%
Salary Increases:	School	Cash Bal pay credit:	8.00%
Current Salary:	\$30,000	Cash Bal Interest credit:	6.00%
CPI:	3.0%	Cash Bal Conversion:	5.00%
Current Age:	45	Stacked limit:	\$31,000
Current Service:	0	Stacked index:	4.00%
		Contribution over cap:	4.00%

DC is 6% ee, 4% er  
 Svc DC grades to 5.75%, 4% er cost, 6% ee

#10

Replacement % through time



Retire at age: 65  
 Service: 20  
 Quit at age: 65

Salary Increases:  
 Current Salary: \$60,000  
 CPI: 3.0%  
 Current Age: 45  
 Current Service: 0

DC returns pre-ret: 8.00%  
 DC returns post-ret: 6.00%  
 DC COLA: 0.0%

Cash Bal pay credit: 8.00%  
 Cash Bal interest credit: 6.00%  
 Cash Bal Conversion: 5.00%

Stacked limit: \$50,000  
 Stacked index: 4.00%  
 Contribution over cap: 4.00%

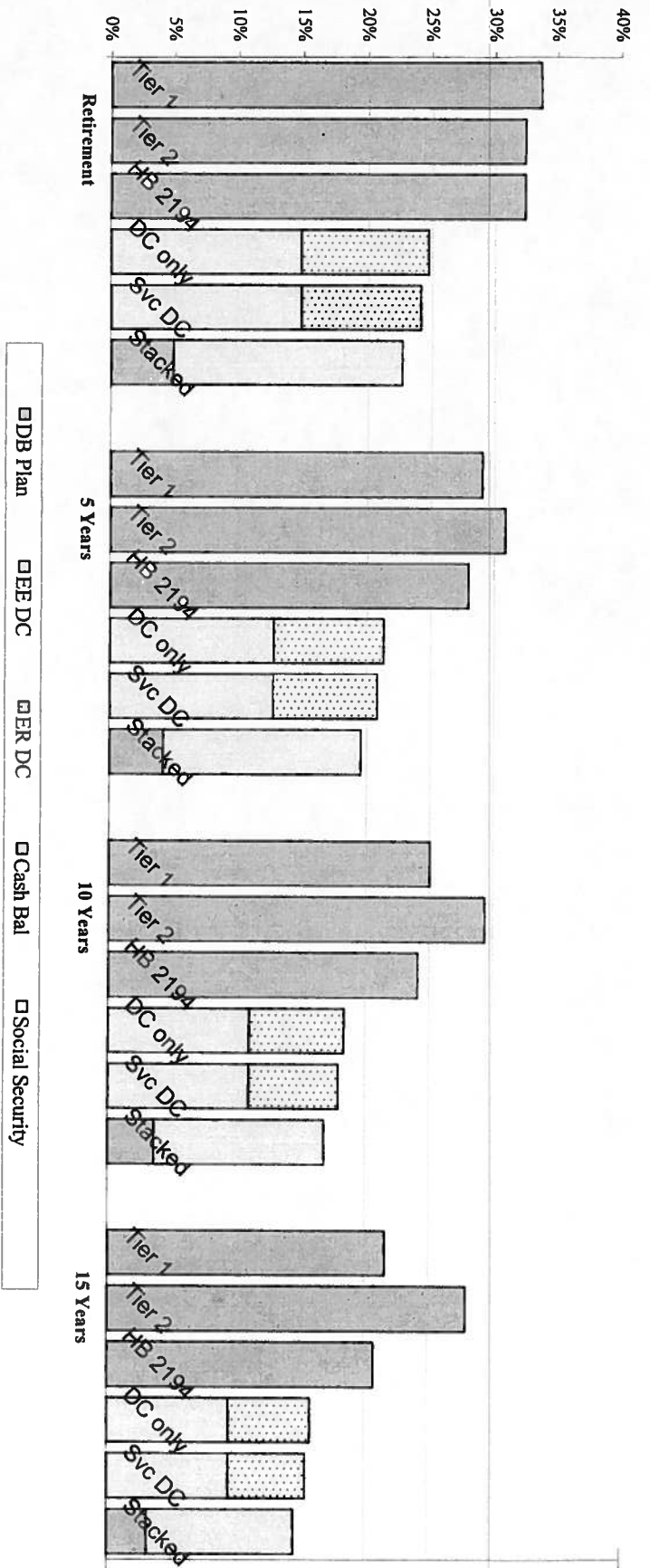
DC is 6% ee, 4% er  
 Svc DC grades to 5.75%, 4% er cost, 6% ee

0 0 for rate in box, 1 for selection

Display Controls

# 11

### Replacement % through time



- DB Plan
- EE DC
- ER DC
- Cash Bal
- Social Security

0 0 for rate in box, 1 for selection

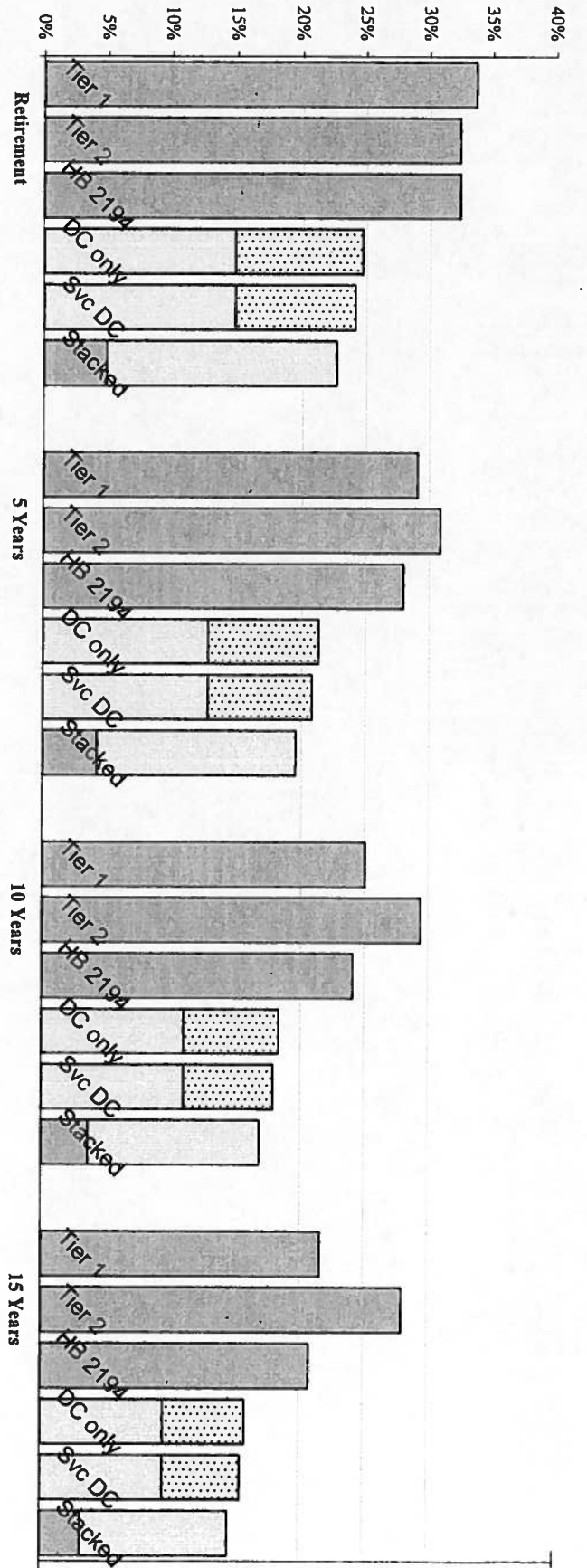
Display Controls

Retire at age:	65	DC returns pre-ret:	8.00%
Service:	20	DC returns post-ret:	6.00%
Quit at age:	65	DC COLA:	0.0%
Salary increases:		Cash Bal pay credit:	8.00%
Current Salary:	\$60,000	Cash Bal interest credit:	6.00%
CPI:	3.0%	Cash Bal Conversion:	5.00%
Current Age:	45	Stacked limit:	\$14,000
Current Service:	0	Stacked index:	4.00%
		Contribution over cap:	4.00%

DC is 6% ee, 4% er  
 Svc DC grades to 5.75%, 4% er cost, 6% ee

#12

### Replacement % through time



- DB Plan
- DBE DC
- DBR DC
- Cash Bal
- Social Security

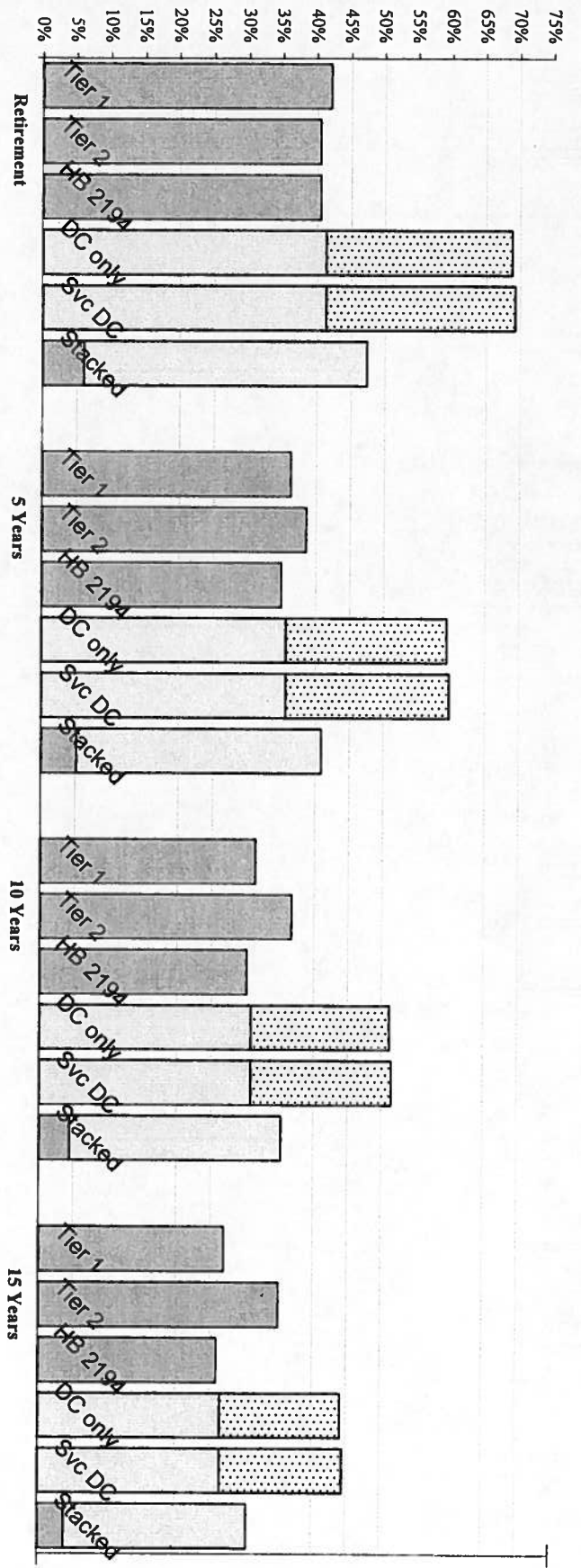
0 0 for rate in box, 1 for selection

Display Controls

Retire at age:	65	DC returns pre-ret:	8.00%
Service:	20	DC returns post-ret:	6.00%
Quit at age:	65	DC COLA:	0.00%
Salary Increases:		Cash Bal pay credit:	8.00%
Current Salary:	\$60,000	Cash Bal interest credit:	6.00%
CPI:	3.0%	Cash Bal Conversion:	5.00%
Current Age:	45	Stacked limit:	\$14,000
Current Service:	0	Stacked index:	4.00%
		Contribution over cap:	4.00%

DC is 6% ee, 4% er  
 Svc DC grades to 5.75%, 4% er cost, 6% ee

### Replacement % through time



- DB Plan
- BE DC
- BR DC
- Cash Bal
- Social Security

0 0 for rate in box, 1 for selection

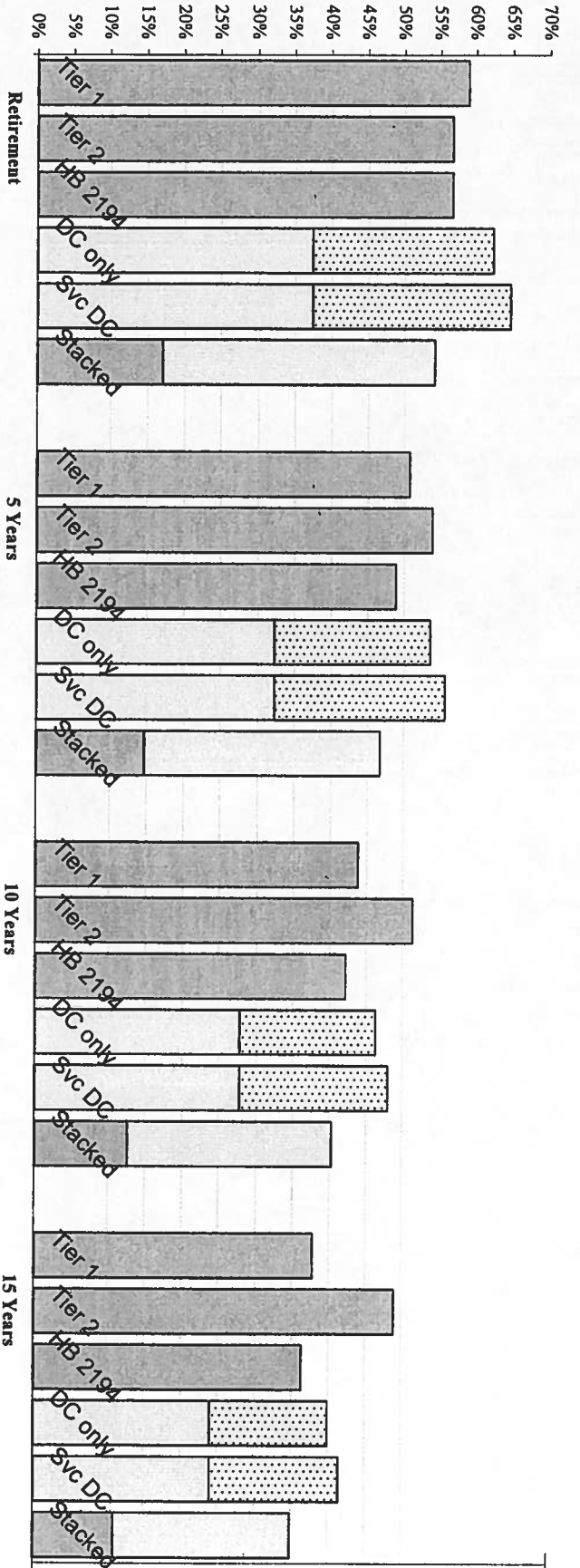
Display Controls

Retire at age:	65	DC returns pre-ret:	8.00%
Service:	25	DC returns post-ret:	6.00%
Quit at age:	47	DC COLA:	0.00%
Salary increases:		Cash Bal pay credit:	8.00%
Current Salary:	\$30,000	Cash Bal interest credit:	6.00%
CPI:	3.0%	Cash Bal Conversion:	5.00%
Current Age:	22	Stacked limit:	\$14,000
Current Service:	0	Stacked index:	4.00%
		Contribution over cap:	4.00%

DC is 6% ee, 4% er  
 Svc DC grades to 5.75%, 4% er cost, 6% ee

#14

### Replacement % through time



- DDB Plan
- DEE DC
- DER DC
- Cash Bal
- Social Security

0 0 for rate in box, 1 for selection

Display Controls

Retire at age:	65	DC returns pre-ret:	8.00%
Service:	35	DC returns post-ret:	6.00%
Quit at age:	65	DC COLA:	0.00%

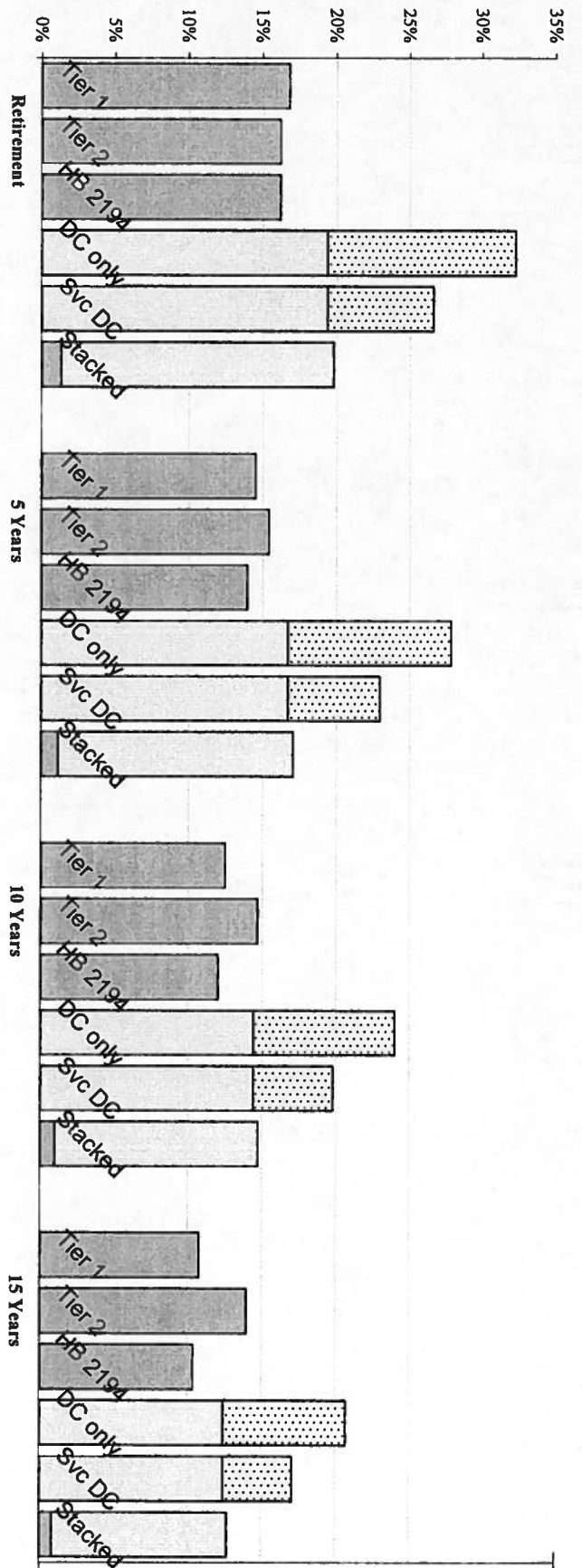
  

Salary increases:	School	Cash Bal pay credit:	8.00%
Current Salary:	\$30,000	Cash Bal interest credit:	6.00%
CPI:	3.0%	Cash Bal Conversion:	5.00%
Current Age:	30	Stacked limit:	\$14,000
Current Service:	0	Stacked index:	4.00%
		Contribution over cap:	4.00%

DC is 6% ee, 4% er  
 Svc DC grades to 5.75%, 4% er cost, 6% ee



### Replacement % through time



- DB Plan
- EE DC
- ER DC
- Cash Bal
- Social Security

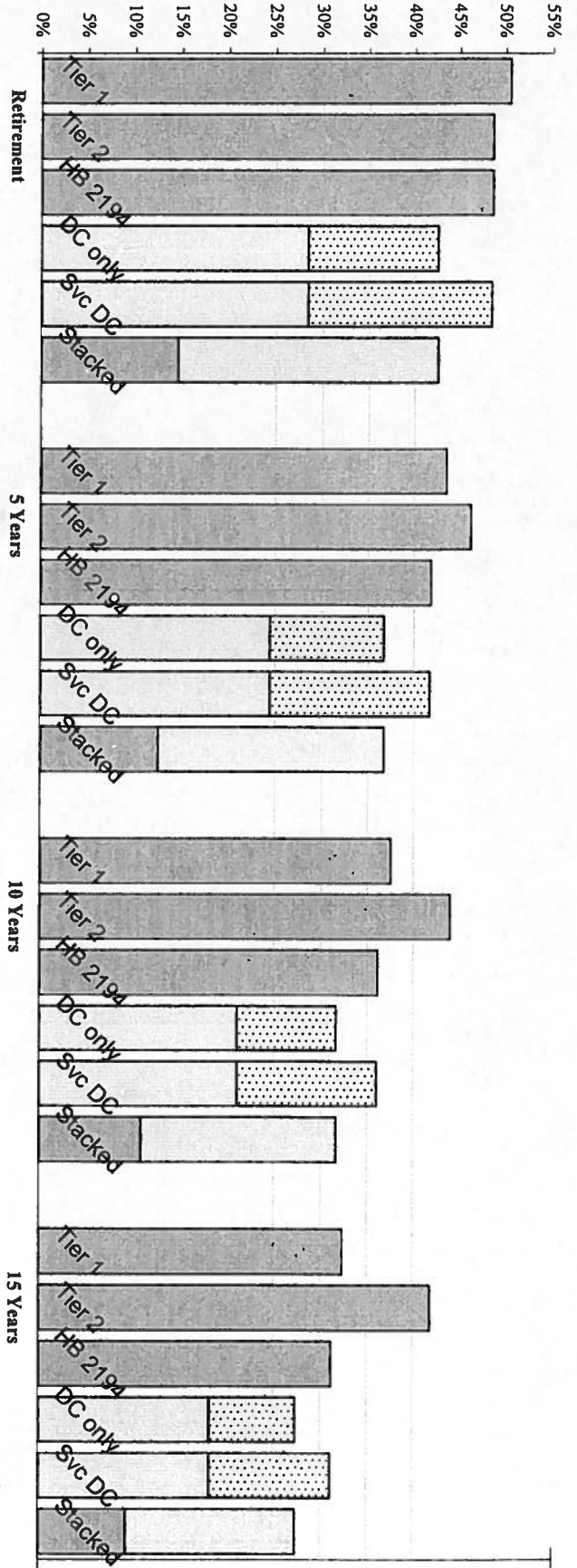
0 0 for rate in box, 1 for selection

Display Controls

Retire at age:	65	DC returns pre-ret:	8.00%
Service:	10	DC returns post-ret:	6.00%
Quit at age:	32	DC COLA:	0.0%
Salary increases:		Cash Bal pay credit:	8.00%
Current Salary:	\$30,000	Cash Bal interest credit:	6.00%
CPI:	3.0%	Cash Bal Conversion:	5.00%
Current Age:	22	Stacked limit:	\$14,000
Current Service:	0	Stacked index:	4.00%
		Contribution over cap:	4.00%

DC is 6% ee, 4% er  
 Svc DC grades to 5.75%, 4% er cost, 6% ee

### Replacement % through time



- DB Plan
- BE DC
- ER DC
- Cash Bal
- Social Security

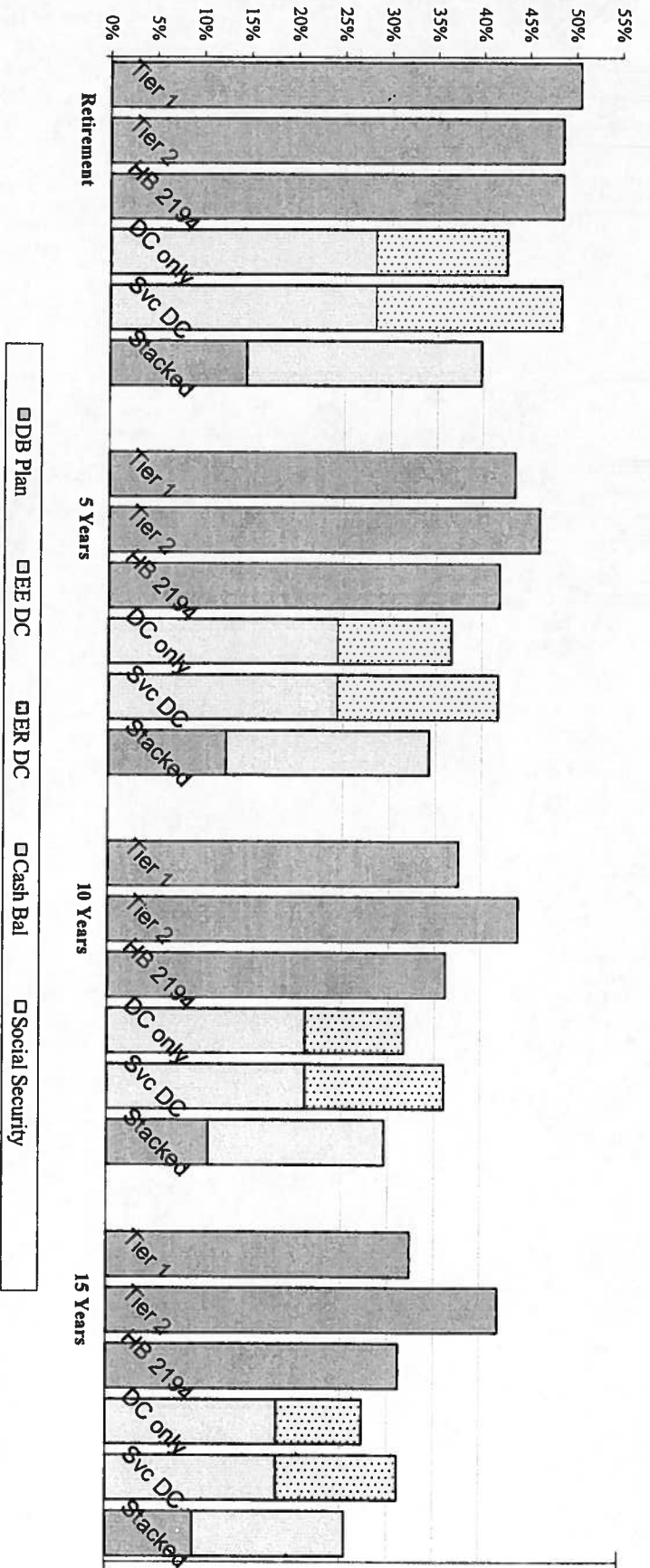
0 0 for rate in box, 1 for selection

Display Controls

Retire at age:	65	DC returns pre-ret:	8.00%
Service:	30	DC returns post-ret:	6.00%
Quit at age:	65	DC COLA:	0.0%
Salary increases:		Cash Bal pay credit:	8.00%
Current Salary:	\$30,000	Cash Bal interest credit:	6.00%
CPI:	3.0%	Cash Bal Conversion:	5.00%
Current Age:	35	Stacked limit:	\$14,000
Current Service:	0	Stacked index:	4.00%
		Contribution over cap:	4.00%

DC is 6% ee, 3% er  
Svc DC grades to 5.75%, 4% er cost, 6% ee

Replacement % through time



Retire at age: 65  
 Service: 30  
 Quit at age: 65

Salary increases:  
 Current Salary: \$30,000  
 CPI: 3.0%  
 Current Age: 35  
 Current Service: 0

School  
 School: 35  
 School Salary: \$30,000  
 CPI: 3.0%

DC returns pre-ret: 8.00%  
 DC returns post-ret: 6.00%  
 DC COLA: 0.0%

Cash Bal pay credit: 8.00%  
 Cash Bal interest credit: 6.00%  
 Cash Bal Conversion: 5.00%

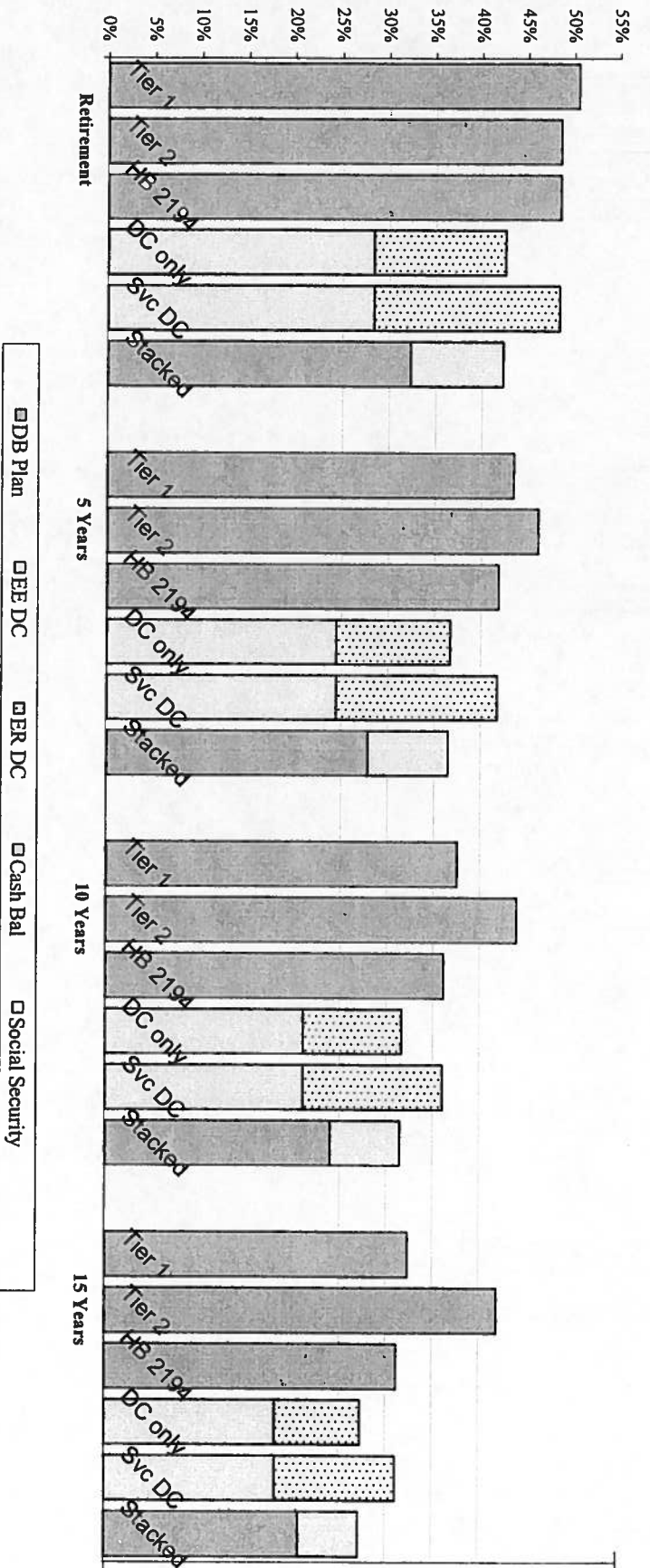
Stacked limit: \$14,000  
 Stacked index: 4.00%  
 Contribution over cap: 3.00%

0 0 for rate in box, 1 for selection

Display Controls

DC is 6% ee, 3% er  
 Svc DC grades to 5.75%, 4% er cost, 6% ee

Replacement % through time



Retire at age: 65  
 Service: 30  
 Quit at age: 65

Salary increases:  
 Current Salary: \$30,000  
 CPI: 3.0%  
 Current Age: 35  
 Current Service: 0

DC is 6% ee, 3% er  
 Svc DC grades to 5.75%, 4% er cost, 6% ee

DC returns pre-ret: 8.00%  
 DC returns post-ret: 6.00%  
 DC COLA: 0.00%

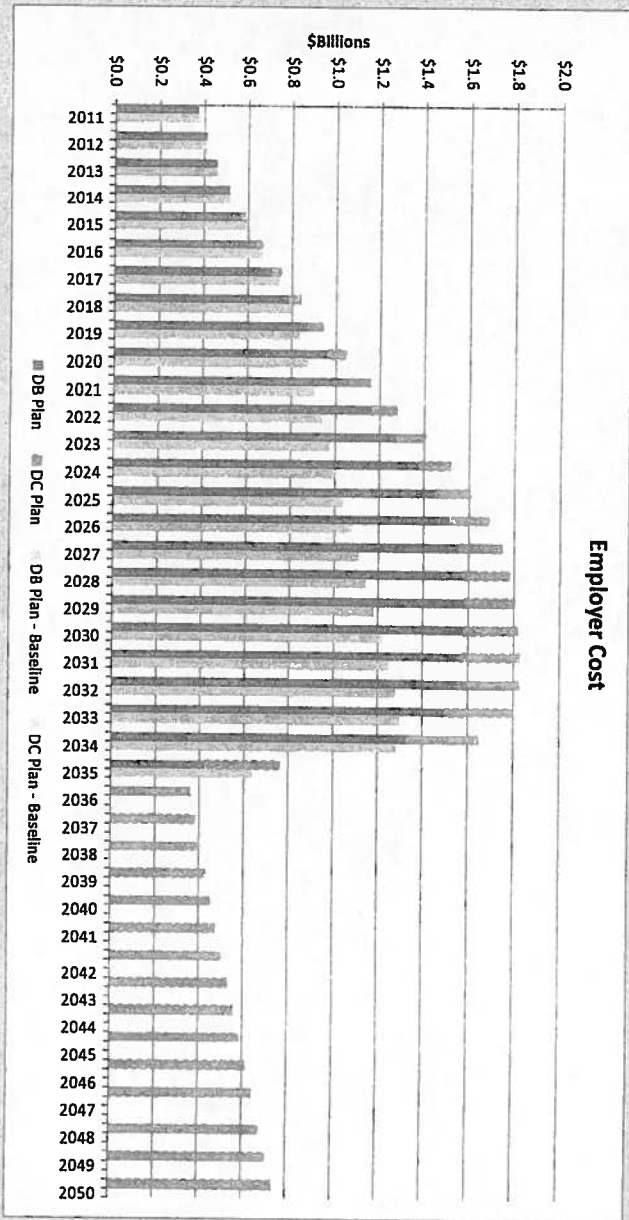
Cash Bal pay credit: 8.00%  
 Cash Bal interest credit: 6.00%  
 Cash Bal Conversion: 5.00%

Stacked limit: \$31,000  
 Stacked index: 4.00%  
 Contribution over cap: 3.00%

0 0 for rate in box, 1 for selection

Display Controls

**Kansas Public Employees' Retirement System**  
 Projection of Actuarial Funding and Expected Employer Contributions  
 State/School Members  
 Based on December 31, 2010 Valuation Results



Employer Cost

■ DB Plan ■ DC Plan ■ DB Plan - Baseline ■ DC Plan - Baseline

Contribution Amount

Include baseline on graphs

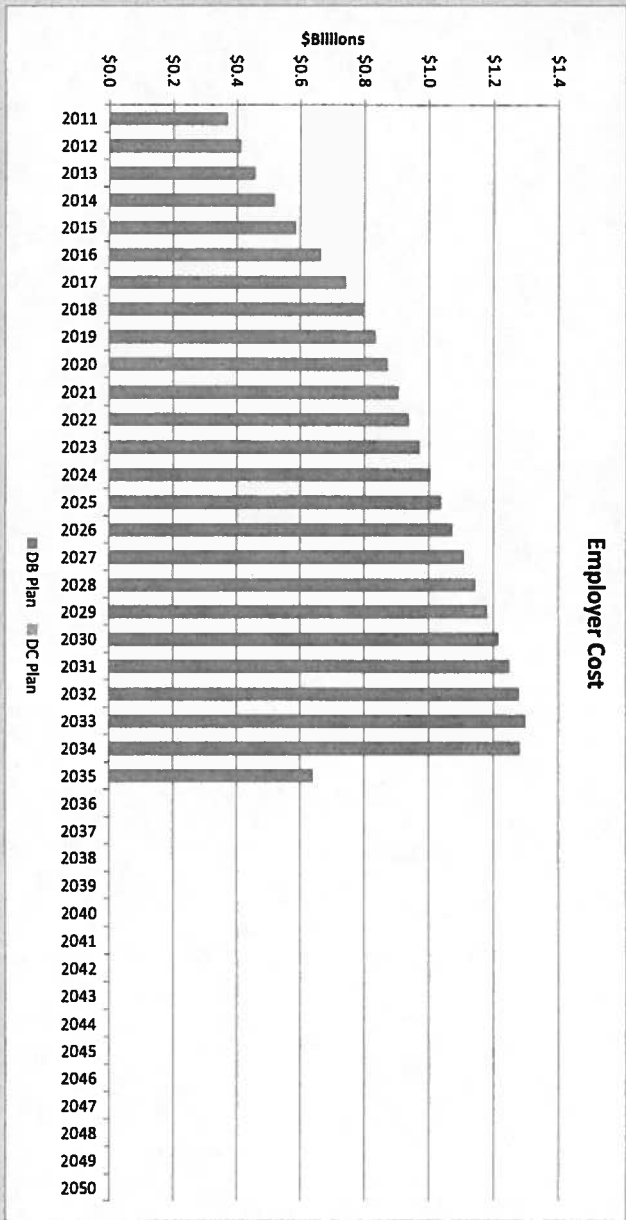
Use current as baseline

Input page

#20

11/8/2011

**Kansas Public Employees' Retirement System**  
 Projection of Actuarial Funding and Expected Employer Contributions  
 State/School Members  
 Based on December 31, 2010 Valuation Results



Contribution Amount

Include baseline on graphs

Use current as baseline

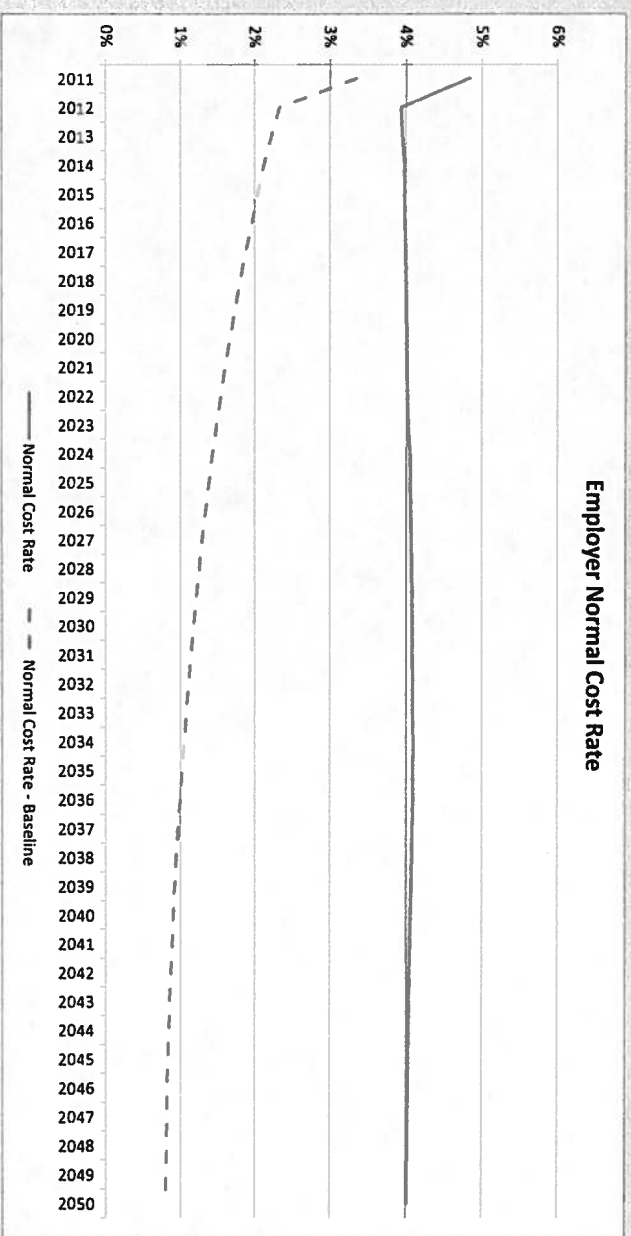
Input page

# 21

11/8/2011

**Kansas Public Employees' Retirement System**  
**Projection of Actuarial Funding and Expected Employer Contributions**  
 State/School Members  
 Based on December 31, 2010 Valuation Results

**Employer Normal Cost Rate**



Normal Cost Rate

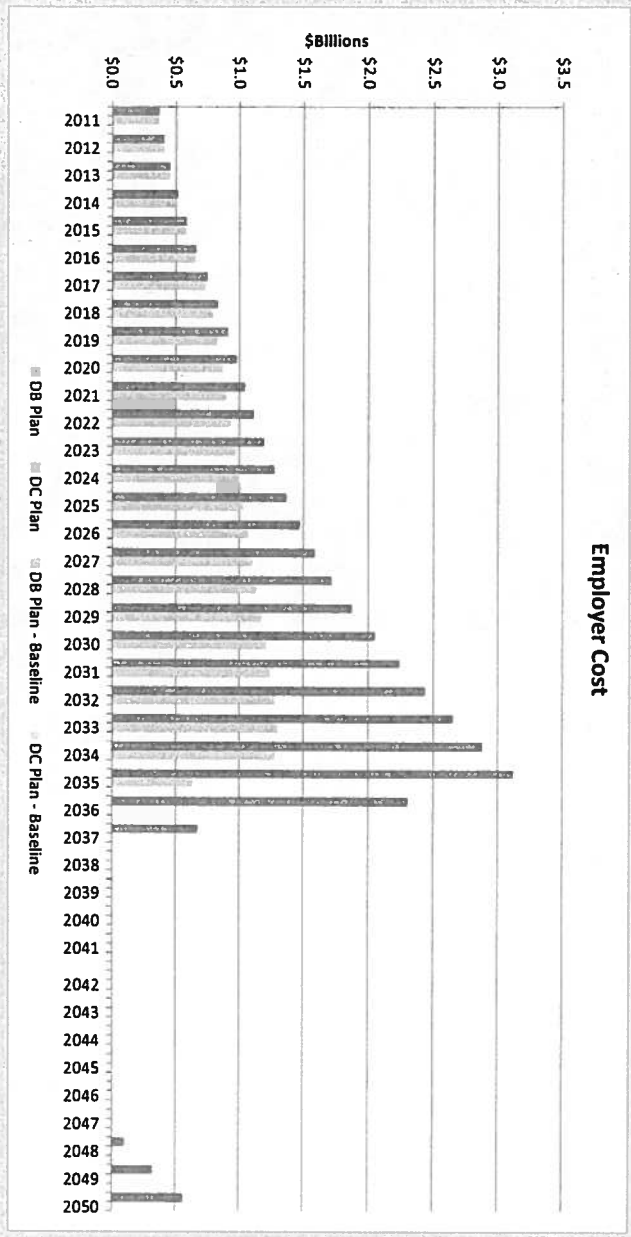
Include baseline on graphs

Use current as baseline

[Input page](#)

11/8/2011

**Kansas Public Employees' Retirement System**  
**Projection of Actuarial Funding and Expected Employer Contributions**  
**State/School Members**  
 Based on December 31, 2010 Valuation Results



Contribution Amount

Include baseline on graphs

Use current as baseline

Input page

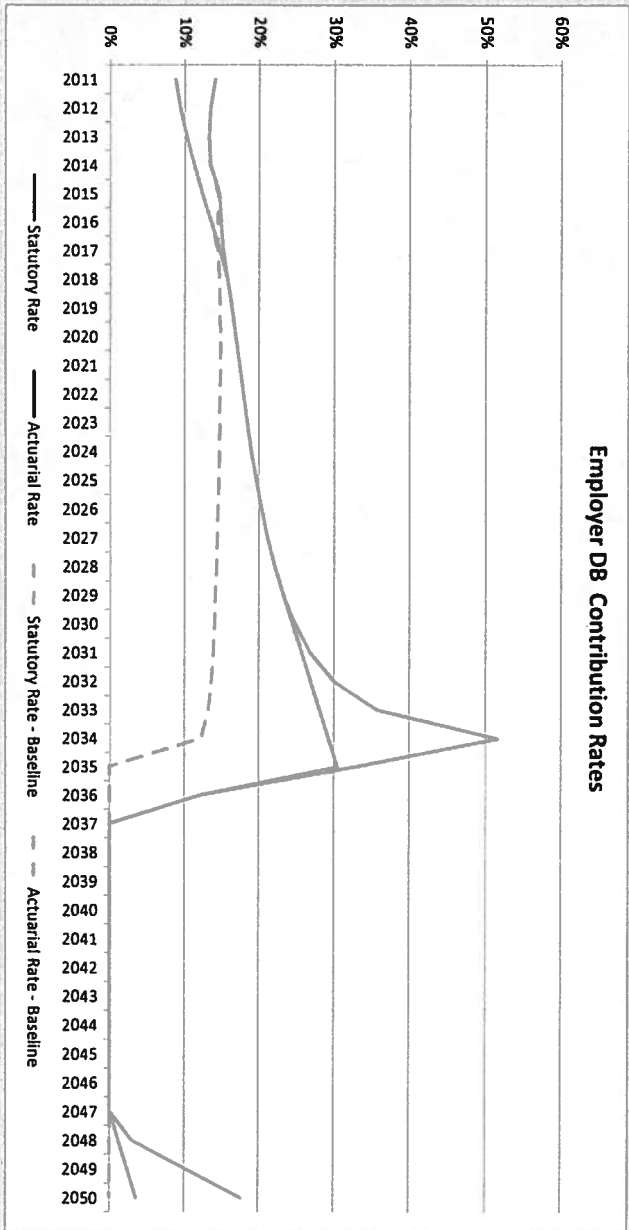
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11-8-2011



**Kansas Public Employees' Retirement System**  
**Projection of Actuarial Funding and Expected Employer Contributions**  
**State/School Members**  
 Based on December 31, 2010 Valuation Results

**Employer DB Contribution Rates**



Contribution Rate

Include baseline on graphs

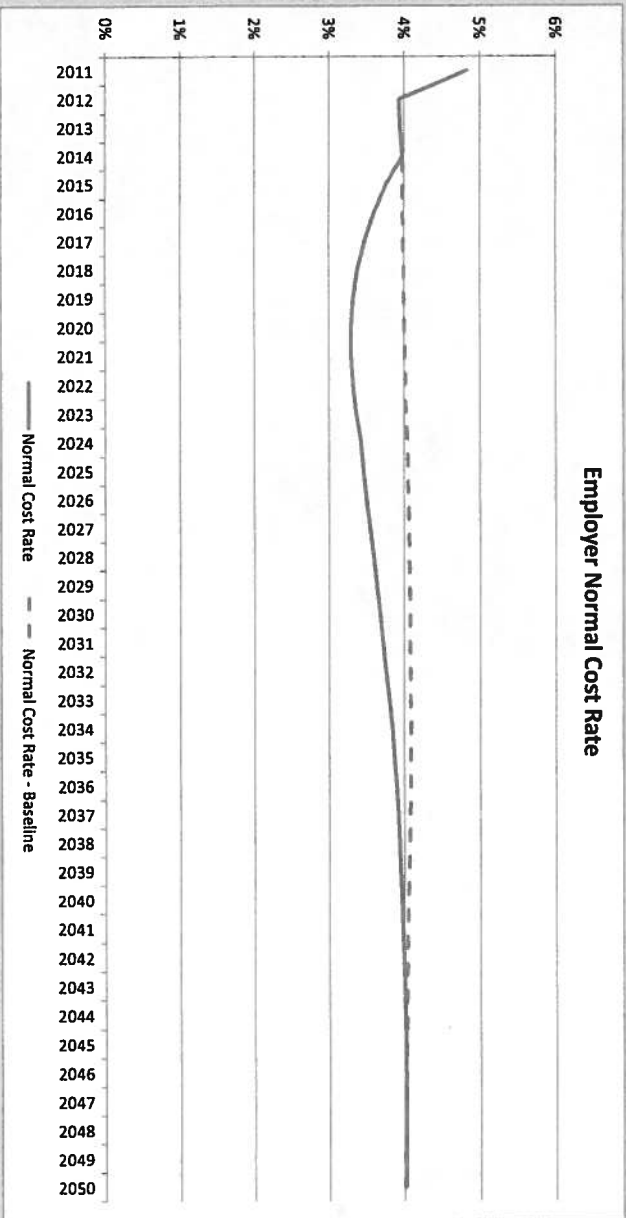
Use current as baseline

Input page

#24

11-8-2011

**Kansas Public Employees' Retirement System**  
**Projection of Actuarial Funding and Expected Employer Contributions**  
**State/School Members**  
 Based on December 31, 2010 Valuation Results



Normal Cost Rate

Include baseline on graphs

Use current as baseline

Input page

#25

11-8-2011