

Better Plans for the Better-Paid: Determinants and Effects of 401(k) Plan Design

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Motivation

- Prior research shows employer match influences employee saving behavior
 - Wide variation in findings
 - Sometimes contradictory results
 - Issues: Introducing v. enhancing a match, methodology differences
- Few address broader question:
 - Why do employers design matches the way they do?
 - Why do employers design non-monetary features the way they do?
- This paper: exploits rich dataset to analyze plan design and employee behavior
 - Is 401(k) plan design simply a form of tax-advantaged compensation? OR
 - Do employers use 401(k) plans to attract/retain employees with other characteristics (e.g., older, more experienced workforce or better savers)?

Unique and Rich DataSet

- 507 plans: > 740,000 covered workers (2001)
- Exceptional detail at plan design level
 - Match design formulas (e.g., \$0.50 on the \$1.00 on 6% of pay)
 - Presence of DB or other DC plan
 - Investment menu: size, % in equity funds, company stock, allocations
 - Loans and after-tax contributions
- Decomposition of match formula:
 - Match rate on first 3% of pay (mean \$0.55)
 - Match rate on next 3% of pay (mean \$0.37)
 - Match rate on next 2% of pay (mean \$0.15)
 - Match threshold—e.g., 6% of pay (mean 4.9%)
 - Maximum economic value—e.g., in \$0.50 per \$1 up to 6% of pay (mean 3%)
- Participant demographics
- Industry controls

Plan Level Descriptive Statistics

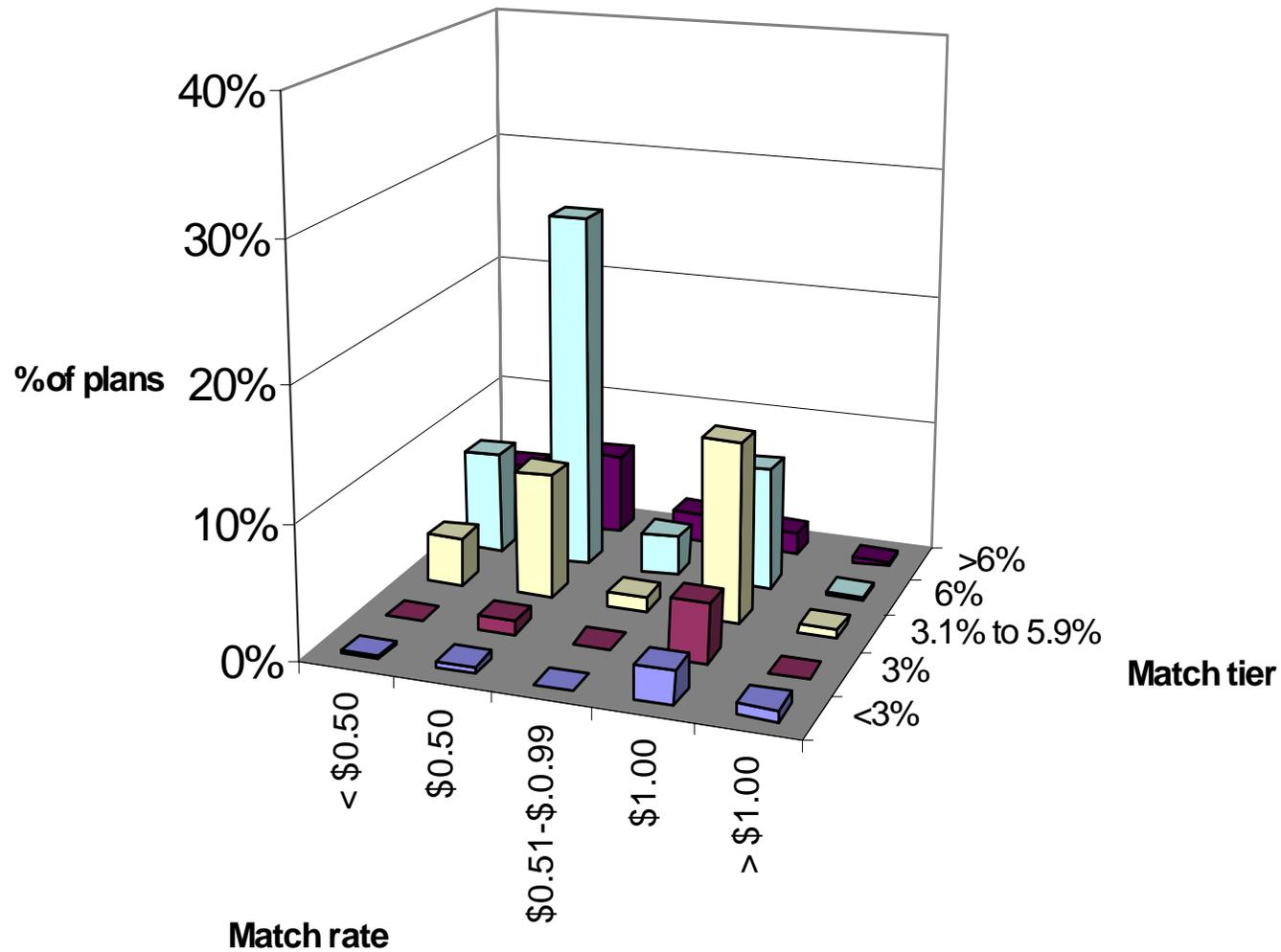
Match design

- 82% of plans offer match (18% don't)
 - 71% of formulas single tier (11% multi-tier)
 - Modal match: \$0.50 per \$1 on the first 6% of wages
- Wide range of *promised* matches: 1-6% of pay
 - Mean & median 3% of pay
- *Actual* cost of 3% promised match only 1.8% (mean)
 - 2/3 of gap (0.7%) due to non-participation; 1/3 (0.4%) to low contribution rates

Employee behavior

- Av. participant: age 42, 9 years on job, \$64K pay, \$54K in 401(k)
- Av. plan participation: 77%; av. contribution rate 6.8%
- Av. plan offers 12.6 options, participants use only 3
- Av. contribution to equities 74%
- One-quarter web-registered; 15% have outstanding loan

401(k) Plans Complex: Heterogeneity of Match Formulas



401(k) Plan Critical (and complex) Tax Limits

Contribution limits

- 402(g) limit: elective deferrals limited to \$10.5K ('01).
- 415 limit: max 25% in any qualified plan arrangement.

Nondiscrimination testing (NDT) rules

- We divide employees into NHCEs (< \$85K in 2001) vs HCEs (the rest)
- General rule: Spread betw/ contribution rates $\leq 2\%$.
- Otherwise, HCEs must be limited

- Sec 401(a) compensation: \$170K in 2001
 - \$1m participant saving \$10.5K in plan has *actual* plan contribution rate of ~1%, but *plan contribution rate* of 6.17%
 - As the number of HCEs above \$170K and saving \$10.5K increases, the HCE saving rate converges on 6.17% (average is 6.8%)

- **Implication:** Under standard NDT rule, employers have incentive (a penalty on best-paid employees) to get NHCEs to ~ 4-5%

Our Empirical Approach

Employer plan design equation

- *Monetary aspects*: Presence of match; match on first 3%, next 3% and next 2%; match threshold; overall economic value
- *Non-monetary aspects*: Size of investment menu, equities in menu, company stock, loans, after-tax contributions

$$PD_j = \beta_0 + \beta_1 ER_j + \beta_2 \cdot EE_j + \beta_3 \cdot TAX_j + \varepsilon_1$$

Employee behavior equation

- *EE contributions*: NHCE participation and NHCE contributions; HCE participation and HCEs at the \$10.5K limit.
- *EE investments*: Percent in equities, percent in company stock, take-up of loans, after-take contributions, number of options in portfolio

$$EEBehavior_j = \gamma_0 + \gamma_1 \cdot PD_j + \gamma_2 ER_j + \gamma_3 \cdot EE_i + \gamma_4 TAX + \varepsilon_2$$

Employer cost equation

- Actual cost of ER match as % of pay

$$ERContrOverComp = \lambda_0 + \lambda_1 \cdot PD_j + \lambda_2 ER_j + \lambda_3 \cdot EE_i + \lambda_4 TAX + \varepsilon_3$$

Findings: Employer Plan Design

- Employer match depends on firm size, economic sector, & compensation of mean NHCEs. Age, tenure and gender have no effects.
- Non-monetary features also determined by firm size and mean compensation.

DESIGN OF THE MATCH					
NHCE mean income	Positive match	Match on first 3%	Match on next 3%	Match tier	Employer maximum cost
25,000	80%	51	37	5.4	2.3
30,000	84%	54	39	5.5	2.5
35,000	87%	58	40	5.6	2.8
40,000	91%	62	42	5.7	3.0
45,000	94%	65	44	5.8	3.3
50,000	98%	69	45	6.0	3.5
55,000	100%	73	47	6.1	3.8

Findings: Employee Savings Behavior

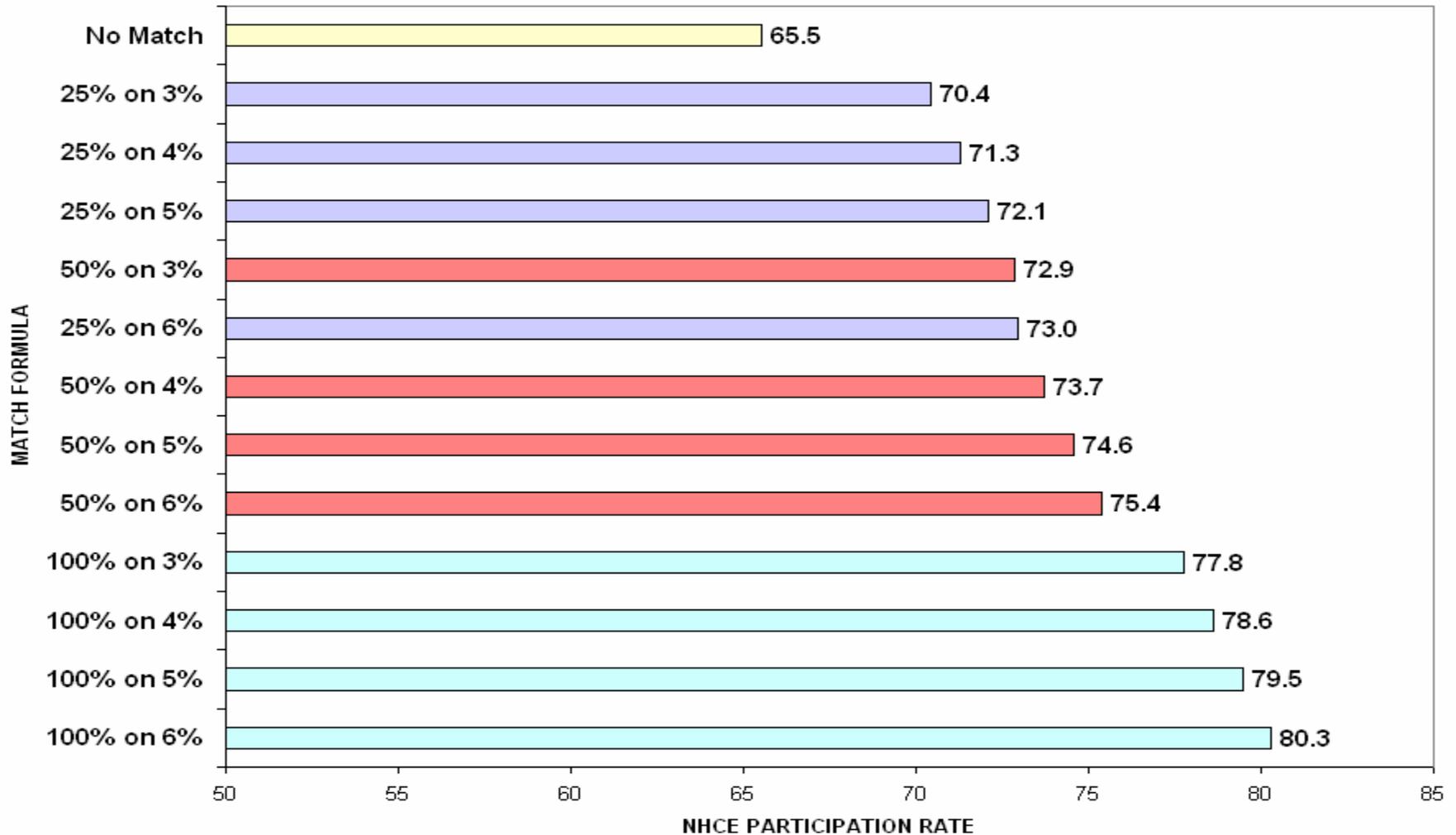
- NHCE participation: ER match has positive impact on first 3% of pay, which then turns 0 and negative at even higher rates of pay.
- NHCE contribution rates: Only loans have impact.

NHCE participation				
Base participation rate (no match):			65.4	%
	Match rates			
Tier	25	50	100	
3	70.4	72.9	77.8	
4	71.3	73.7	78.6	
5	72.1	74.6	79.5	
6	73.0	75.4	80.3	

NHCE savings rates				
Base savings rate (no match):			6.7	%
	Match rates			
Tier	25	50	100	
3	6.6	6.5	6.3	
4	6.6	6.5	6.3	
5	6.6	6.5	6.3	
6	6.6	6.5	6.3	

- EE demographics (income, tenure, gender) have an important impact on saving behavior. Does this reflect ER intention to reward savers in the workplace (Ippolito), or just workers' own taste for saving?

Pure Incentive Effect of the Match (on NHCE participation rate)



Findings: Actual employer costs

- Actual costs principally shaped by match design – i.e. driven by employee income, not other employee demographics.

EMPLOYER COSTS (AS % OF PAYROLL)				
		Match rates		
Tier		25	50	100
3	0.25	0.63	1.38	
4	0.44	0.99	2.09	
5	0.62	1.35	2.80	
6	0.81	1.71	3.51	

Summary

- Match design (and other plan features) designed around NHCE (workers) comp
 - 401(k) plans appear to be largely complex compensation arrangements
 - Employers do not seek to attract/retain employees with other traits
 - Hence “better plans for the better-paid”
- Employee saving (and other behaviors) strongly influenced by plan design
 - Pure incentive effect of match surprisingly modest: participation rates range from 65-80% (for no match, to 100% on 6%)
 - No effect of match on saving rates: only loans significant
- Demographics significantly influence participation/saving rates.
 - Do employers seek to reward savers at the expense of non-savers?
 - No: actual costs depend on match design, not demographics
 - Demographic effects reflect workforce’s tastes for saving

Implications

- Matches are imperfect vehicle for boosting retirement saving security:
 - Incentives weaker (at plan level) or less in demand (at employee level) for lower wage, low-tenured populations
 - Retirement security “local” to firm characteristics (size, sector) and workforce earnings: better to work with the better-paid!
- Other options: auto enrollment/autopilot 401(k), non-elective employer contributions, mandatory contributions (Australia or Singapore).
- NDT rules inequitable across firms:
 - Better paid workforces demand better matches and have higher savings rates → more likely to pass NDT
 - Lower-paid workforces have lesser matches and lower savings rates → more likely to fail NDT