

Health Insurance Decisions, Expectations, and Job Turnover

Randall P. Ellis

Boston University and UTS-CHERE

Albert Ma

Boston University

Outline of presentation

- ◆ Introduction
- ◆ Policy context and prior literature
- ◆ Empirical data to motivate the problem
- ◆ Model of labour market turnover
- ◆ Data
- ◆ Empirical results
- ◆ Next steps

US private health insurance setting

- ◆ Employers are not required to offer health insurance to their employees.
- ◆ Employees are not required to choose or pay for health insurance even when it is offered.
- ◆ In 1999 uninsured **workers** and their dependents comprise 32.9 million of the estimated total of 42 million uninsured in that year. (Blumberg and Nichols, 2002)
- ◆ Over 75 million people uninsured for some spell during a two year period – one third of all non-elderly.

The central question:

Why do employers rationally choose not to offer health insurance even when:

- ◆ their employees are risk averse
- ◆ significant tax advantage to offering insurance
- ◆ Individual insurance market has very high transaction costs and adverse selection problems

Complex answers

- ◆ Market competition?
- ◆ Taste heterogeneity
- ◆ Large cross subsidies across different employees?
- ◆ Employers do not want to attract unhealthy workers

Our answer for very small firms

- ◆ Enormous differences in expected costs of different employees
- ◆ High labour market turnover, especially in small firms
- ◆ Turnover rates influenced by insurance choice
- ◆ Insurers do not reward small firms for healthier than average employees
- ◆ Dynamic adverse selection problem

Key literature

- ◆ Blumberg and Nichols (2002)
 - Review firm level models of employer insurance decisions.
 - 80 percent of workers who are offered insurance take it
- ◆ Chernew and Hirth (2002)
 - “models of perfect sorting become more complex in a dynamic context in which workers develop firm specific human capital, but their tastes for coverage may change over time. Costs of switching jobs would tend to generate imperfect matching of preferences to benefit design over time.” (p. 11.)”

Key literature (2)

- ◆ Bundorf (2002)
 - Used employer 1993 RWJ survey data to show that
 - Heterogeneity of workers matters
 - Turnover variable insignificant
- ◆ Ellis and Aragao (2001)
 - Switching costs matter in dynamic setting
 - Health care markets vulnerable to death spirals
 - A price floor can be welfare improving

US MEDSTAT MarketScan claims data

- ◆ 1 million covered lives
- ◆ 1998-1999
- ◆ Privately insured, Mostly large employers
- ◆ Fee for service, managed care
- ◆ Cost and eligibility information on each person
- ◆ Minimal demographic information
 - (age, gender, retiree status, family relationship code, family ID, industry group)

Definitions

Newcomers: Someone joining a health plan during past 12 months

Leavers: someone leaving a health plan during past 12 months

Turnover rate: Newcomers + Leavers divided by end of total enrollees

Later, use turnover rate of employees, not plan enrollees

Figure 1
 Sample Proportions of **Female** Health Plan Enrollees, by Turnover Status,
 By Age groups, MEDSTAT commercially insured data 1998-99.

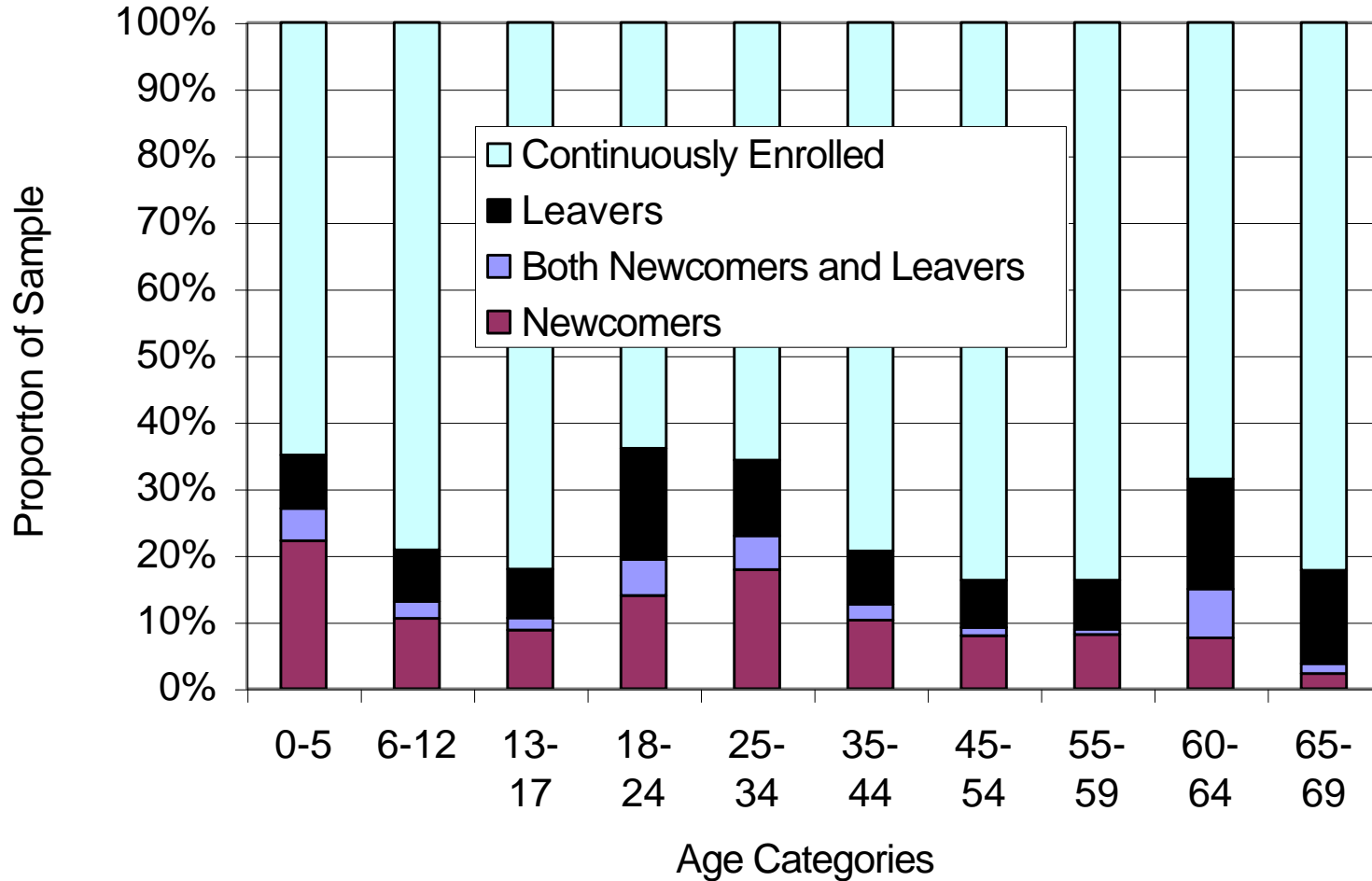


Figure 2

Sample Proportions of **Male** Health Plan Enrollees, by Turnover Status, By Age groups, MEDSTAT commercially insured data 1998-99.

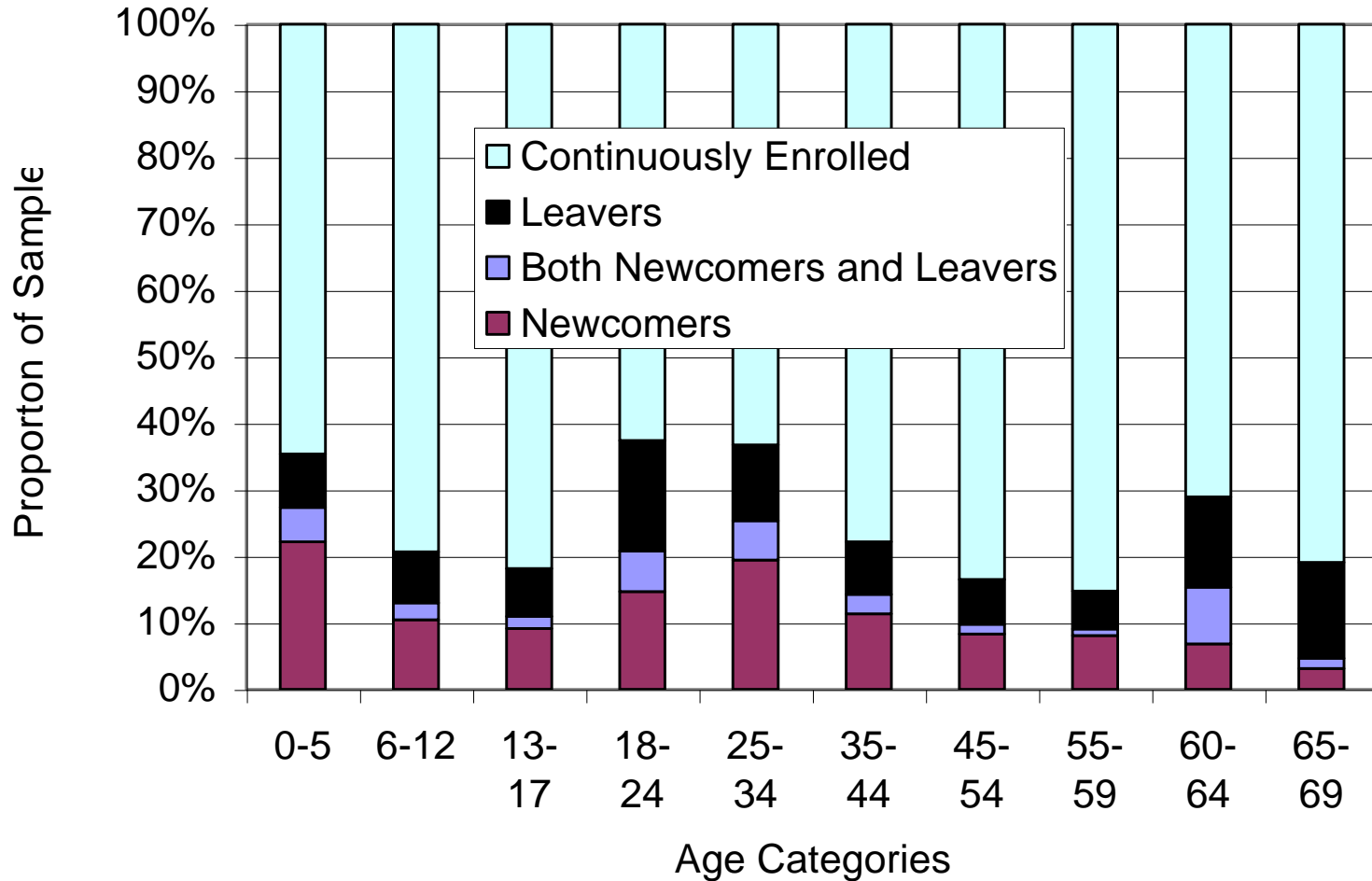


Figure 3

Relative Costs of **Female** Health Plan Enrollees by Turnover Status, by Age Groups, MEDSTAT commercially insured, 1997-99

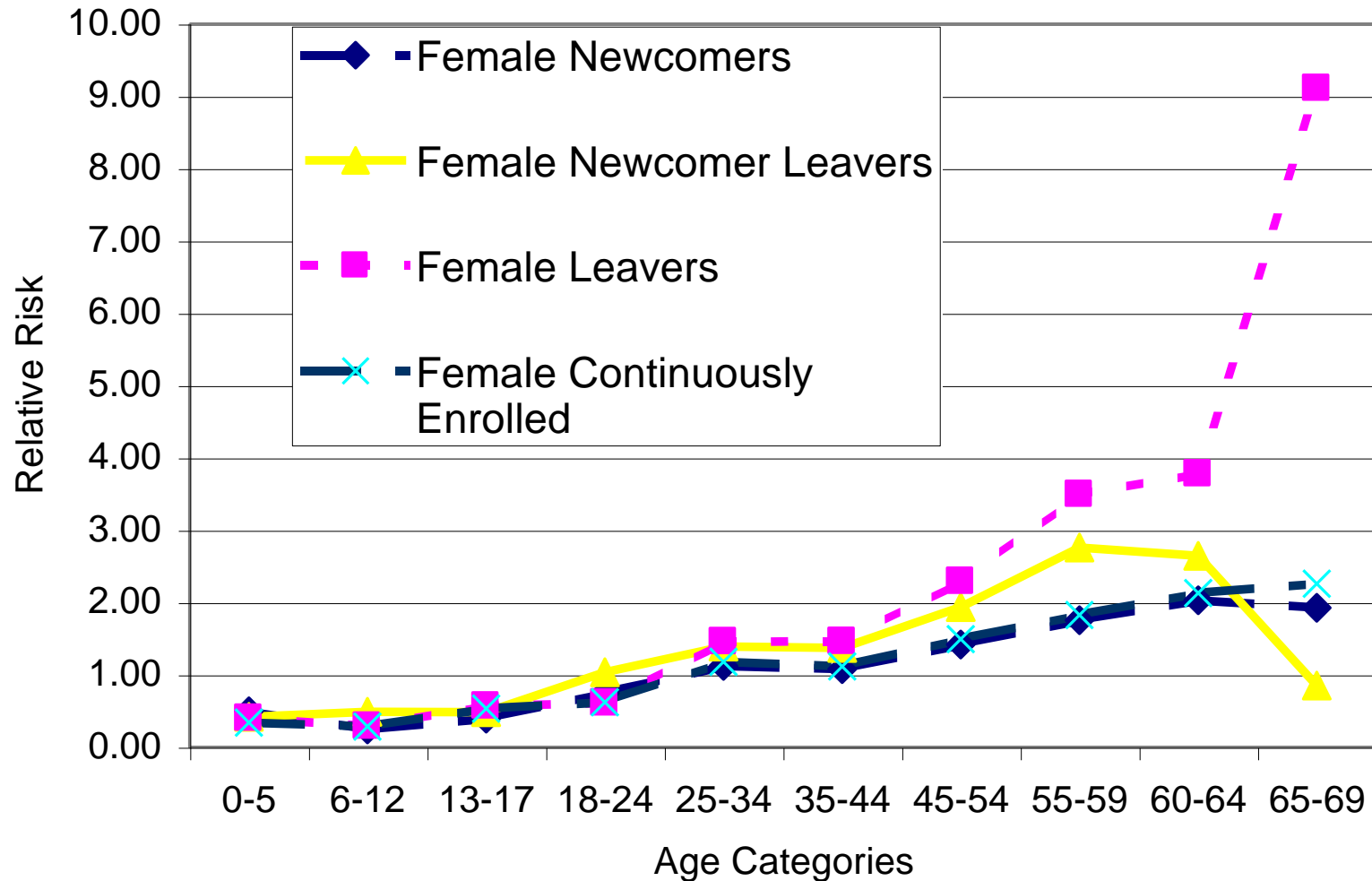
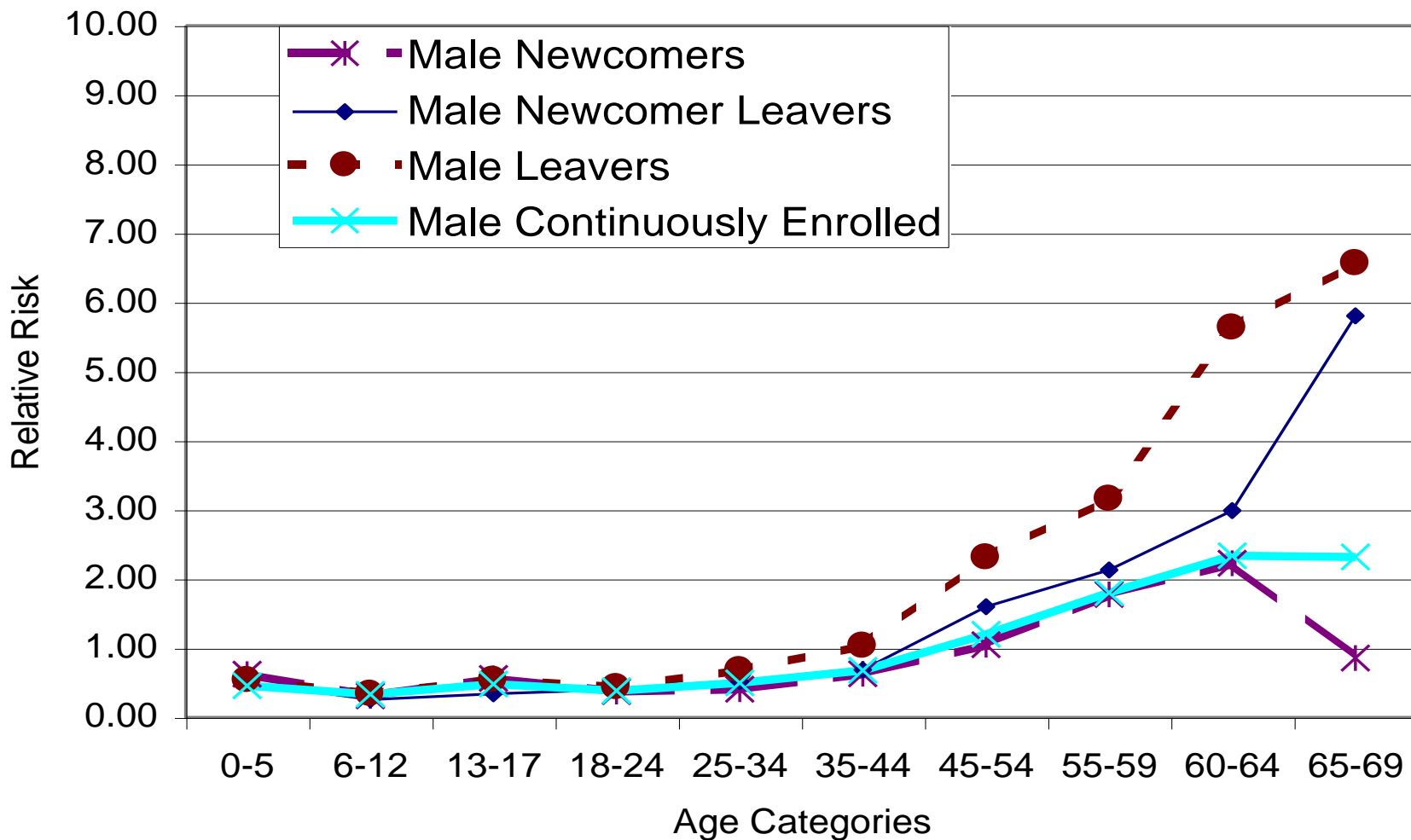


Figure 4
 Relative Costs of **Male** Health Plan Enrollees by Turnover Status,
 by Age Groups, MEDSTAT commercially insured, 1997-99



Simple conceptual model

- ◆ All workers equally productive to firm.
- ◆ Two types of employees: high and low health care costs H and L
- ◆ Employee type is unobservable by firm when hiring
- ◆ Insurer can verify current distribution of H and L types
- ◆ Tax subsidy and risk aversion mean that each type of employee values insurance at more than its cost to employer

Notation

	H	L
Health insurance cost	C_H	C_L
Firm proportions of H	a	$1-a$
Population proportions of H	A	$1-A$
Proportion of workers leaving: With insurance	λ_H^1	λ_L^1
Without insurance	λ_H^0	λ_L^0
Tax subsidy for health insurance	t	t

Cost relations

Firms expected costs:

$$\text{Premium} = a C_H + (1 - a) C_L$$

High cost types will always want insurance

Low cost types will want insurance if

$$(1 - t) \text{Premium} < C_L$$

$$\Rightarrow a < [t / (1 - t)] C_L / (C_L + C_H)$$

Turnover relations holding wages constant

$$\lambda_H^1 < \lambda_H^0$$

$$\lambda_L^1 < \lambda_L^0$$

$$\lambda_H^1 < \lambda_L^1$$

$$\lambda_L^0 < \lambda_H^0 ?$$

$$\lambda_H^1 < \lambda_L^1 < \lambda_L^0 < \lambda_H^0$$

$$\Rightarrow \lambda_H^0 - \lambda_H^1 > \lambda_L^0 - \lambda_L^1$$

Firm transition of health costs

Dynamic equation for health care cost transitions (ignoring insurance status)

$$C_{t+1} = a (1 - \lambda_H) C_H + (1-a) (1 - \lambda_L) C_L + [a \lambda_H + (1-a) \lambda_L] \hat{C}$$

Where \hat{C} = Population average cost
= $A C_H + (1 - A) C_L$

C_{t+1} does not asymptote to \hat{C}

Firm steady state health costs

$$C_{t+1} = C_t$$

$$\Rightarrow a (1 - \lambda_H) C_H + (1-a) (1 - \lambda_L) C_L +$$

$$[a \lambda_H + (1-a) \lambda_L] [A C_H + (1-A) C_L] = a C_H + (1-a) C_L$$

$$\Rightarrow a (1 - \lambda_H) + [a \lambda_H + (1-a) \lambda_L] A = a$$

$$\Rightarrow a^* = A [\lambda_L / [\lambda_H - A (\lambda_H - \lambda_L)]]$$

Key results from theoretical model

- ◆ Firms will have different steady state proportions of high and low cost workers if they offer health insurance
- ◆ Insurers know this
- ◆ Adjustment costs mean that insurers will not offer actuarially fair insurance for current set of employees, but rather premiums will be based on expected, long run values for firms offering insurance
- ◆ It is differences in turnover rates between high and low cost employees that matter, not absolute levels.
- ◆ It is expected turnover, not actual turnover that matters

1997 Robert Wood Johnson Survey of Employers

- ◆ 23,000 private and public employers
- ◆ Detailed information about health insurance offerings
- ◆ Establishment data
- ◆ Aggregate employee characteristics
- ◆ New hires and departing permanent employees
- ◆ Extensive plan benefit features and premiums

Sample selection

- ◆ Private employees only
- ◆ Key variables not missing
- ◆ At least one permanent employee
- ◆ Firm size and turnover rates defined using only permanent employees

Table 1 Summary Statistics (unweighted for firm size)

N=21,500

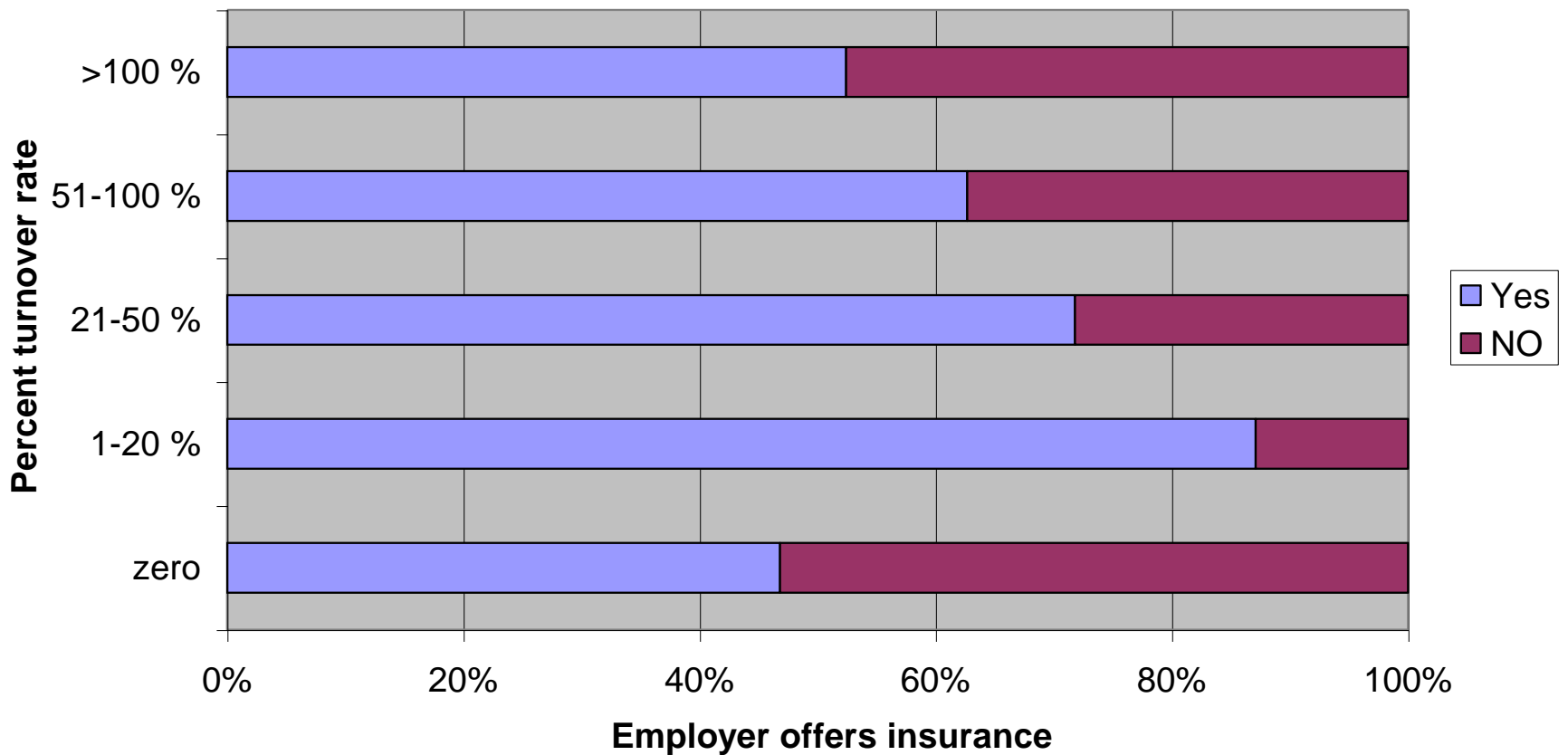
Variable	Full Sample		insure=yes, n=13681		insure=no, n=7819	
	Mean	St.Dev.	Mean	St.Dev.	Mean	St.Dev.
offering insurance	0.636	0.481				
turnover rate	0.483	0.800	0.452	0.719	0.539	0.925
firm has more employees nationwide	0.326	0.469	0.494	0.500	0.147	0.354
fulltime permanent	0.773	0.306	0.840	0.243	0.655	0.363
partime permanent	0.146	0.263	0.097	0.197	0.232	0.333
temporary employee	0.082	0.200	0.064	0.165	0.113	0.247
prop female	0.428	0.321	0.437	0.296	0.433	0.356
Age distribution, Permanent employees						
under 30 yrs	0.279	0.269	0.292	0.244	0.266	0.303
30-39 yrs	0.296	0.255	0.303	0.217	0.283	0.299
40-49 yrs	0.238	0.245	0.242	0.208	0.229	0.286
> 50 yrs	0.178	0.246	0.163	0.201	0.196	0.294
Establishment size, permanent employees						
empl(1-9)	0.523	0.499	0.367	0.482	0.796	0.403
empl(10-24)	0.204	0.403	0.240	0.427	0.140	0.347
empl(25-49)	0.111	0.314	0.149	0.356	0.044	0.205
empl(50-99)	0.069	0.254	0.101	0.301	0.014	0.116
empl(100-249)	0.051	0.221	0.079	0.269	0.004	0.063
empl(>249)	0.042	0.200	0.064	0.245	0.003	0.052

Table 1 Summary Statistics (continued)

N=21,500

Variable	Full Sample		insure=yes,		insure=no,	
	Mean	Std Dev	Mean	Std. Dev.	Mean	Std. Dev.
Industry groups						
agriculture	0.002	0.047	0.002	0.044	0.003	0.051
construction	0.079	0.270	0.072	0.258	0.092	0.289
mining/manufacturing	0.137	0.343	0.171	0.377	0.076	0.265
transportation	0.049	0.216	0.057	0.231	0.035	0.185
wholesale	0.049	0.216	0.060	0.237	0.030	0.170
retail	0.191	0.393	0.145	0.352	0.274	0.446
finance	0.172	0.378	0.179	0.384	0.160	0.367
professional	0.250	0.433	0.262	0.440	0.228	0.420
other services	0.071	0.257	0.053	0.224	0.102	0.303
Turnover Categories						
zero	0.276	0.447	0.203	0.402	0.403	0.491
1-20 %	0.153	0.360	0.209	0.406	0.054	0.226
21-50 %	0.301	0.459	0.340	0.474	0.233	0.423
51-100 %	0.158	0.365	0.156	0.363	0.163	0.369
>100 %	0.112	0.316	0.093	0.290	0.147	0.354

Insurance status by full-time employee turnover rate intervals



Plot of turnover categories by firm size

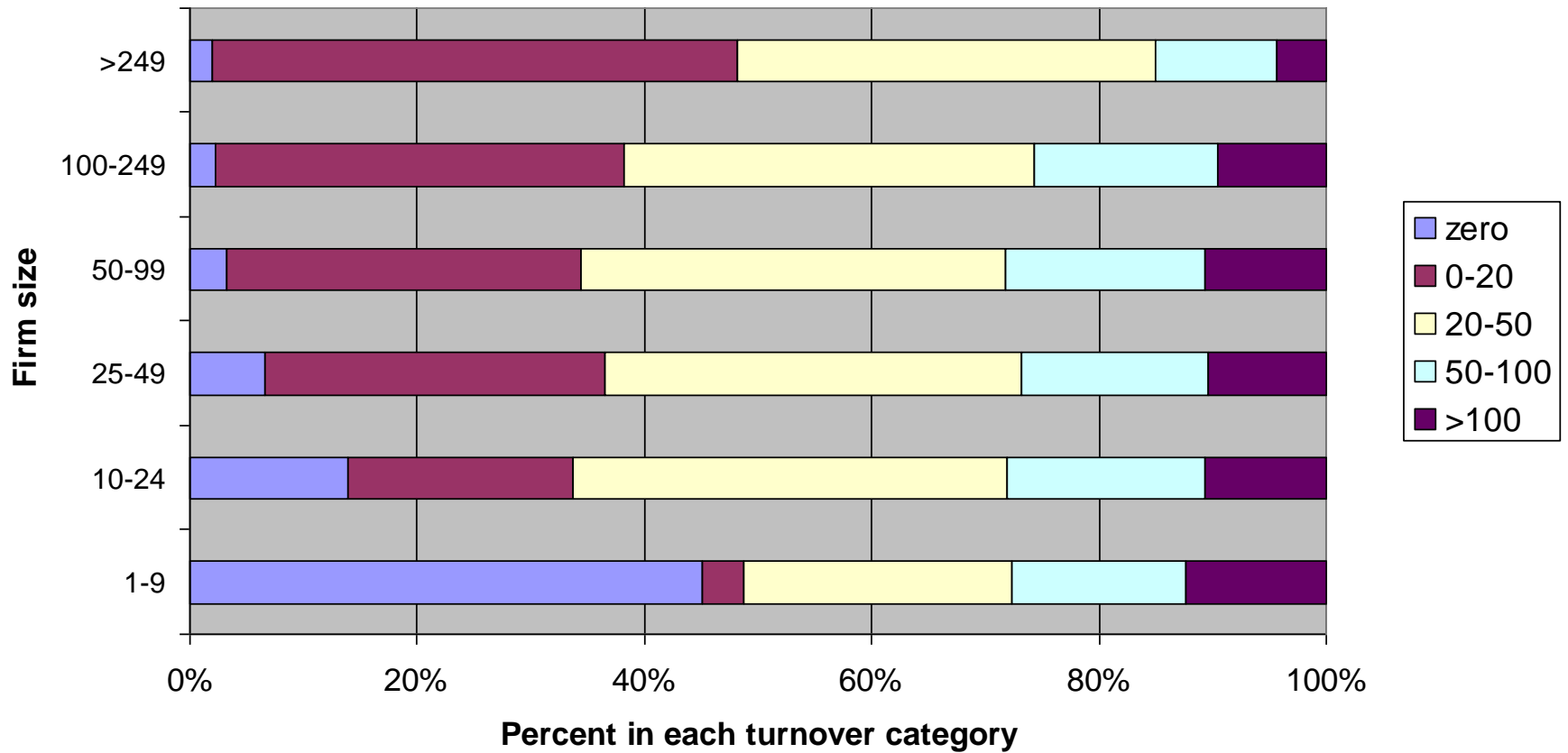


Table 2 Negative binomial model of turnover rate

	Coef	Z
MSA Medium	-0.01	-0.29
MSA Large	-0.01	-0.24
propfulltime	0.015	20.68
proptemp	0.509	11.22
propunion	-0.36	-8.85
females	0.118	4.24
Establishment size, permanent employees		
empl(1-9)	0.435	7.48
empl(10-24)	0.335	5.97
empl(25-49)	0.238	4.14
empl(50-99)	0.258	4.31
empl(100-249)	0.233	3.63
Industry groups		
agr	-0.25	-1.38
const	0.141	3.45
mining	-0.25	-7.10
trans	-0.12	-2.63
wholesale	-0.31	-6.89
retail	0.158	4.71
fin	-0.14	-4.08
prof	-0.28	-8.48

Table 2 Negative binomial model of turnover rate

	Coef	Z
Age distribution, Permanent employees		
under 30 yrs	0.778	17.89
30-39 yrs	0.268	5.84
40-49 yrs	0.119	2.34
more	0.018	0.31
more*size1	0.127	1.89
more*size2	0.122	1.80
more*size3	0.11	1.54
more*size4	0.163	2.17
more*size5	0.056	0.71
_cons	-1.41	-19.09

OBS = 15048

LLF = -50989

Pseudo R2 = 0.032

Table 3 Model of insurance decision

	Probit model		Linear probability		Linear probability fixed	
	COEFF	Z	COEFF	Z	COEFF	Z
Predicted						
turnover rate	-0.071	-1.68	-0.042	-3.37	-0.046	-3.670
propfulltime	-0.005	-5.380	-0.001	-4.63	-0.001	-3.650
proptemp	0.032	0.530	0.024	1.33	0.015	0.820
propunion	0.402	5.520	0.073	4.34	0.071	4.250
females	-0.294	-8.480	-0.087	-8.58	-0.087	-8.650
Establishment size, permanent employees						
empl(1-9)	-1.645	-13.180	-0.47	-18.65	-0.445	-14.830
empl(10-24)	-0.967	-7.700	-0.214	-8.39	-0.195	-6.500
empl(25-49)	-0.553	-4.270	-0.092	-3.42	-0.075	-2.450
empl(50-99)	-0.211	-1.520	-0.019	-0.65	-0.004	-0.140
empl(100-249)	0.303	1.760	0.029	0.92	0.047	1.410
Industry groups						
agr	0.476	2.350	0.15	2.43	0.137	2.220
const	0.240	4.710	0.083	5.44	0.083	5.430
mining	0.514	10.590	0.143	10.44	0.141	10.280
trans	0.446	7.410	0.132	7.8	0.129	7.640
wholesale	0.659	10.730	0.185	10.85	0.184	10.820
retail	-0.079	-1.860	-0.021	-1.69	-0.021	-1.670
fin	0.464	10.680	0.146	11.39	0.146	11.340
prof	0.478	11.360	0.148	11.9	0.148	11.880

Table 3 Models of insurance decision (continued)

	Probit model		Linear probability		Linear probability fixed	
	COEFF	Z	COEFF	Z	COEFF	Z
Age distribution, Permanent employees						
under 30 yrs	-0.170	-3.010	-0.027	-1.64	-0.028	-1.680
30-39 yrs	0.065	1.380	0.025	1.78	0.022	1.580
40-49 yrs	0.172	3.500	0.055	3.69	0.051	3.420
more	0.698	3.570	0.033	1.12	0.033	1.110
more*size1	0.129	0.650	0.272	8.79	0.271	8.750
more*size2	0.026	0.130	0.163	5.06	0.165	5.110
more*size3	-0.208	-1.000	0.065	1.91	0.064	1.900
more*size4	-0.244	-1.100	0.024	0.65	0.024	0.660
more*size5	-0.558	-2.210	-0.015	-0.39	-0.018	-0.460
_cons	1.359	10.180	0.861	29.69	0.843	25.940
	N=	21338	N=	21338	N=	21338
	Pseudo R2=	0.232	R2=	0.264	R2=	0.2678
	LLF=	-10701		F(101, 2129)=		2.18

Note: standard errors corrected for fixed effect clusters but not for fitted independent variable

Next Steps

- ◆ Estimate models using only small employers
- ◆ Correct negative binomial regression results for censoring of zeros
- ◆ Correct standard errors for use fitted negative binomial rate?
- ◆ Interpret magnitude of turnover rate on insurance decision
- ◆ Include interaction of expected turnover with firm size
- ◆ ?