Statistical Discrimination in Labor Markets: An Experimental Analysis

David L. Dickinson
Deptartment of Economics
Appalachian State University

Ronald L. Oaxaca
Deptartment of Economics
University of Arizona

Background

- Statistical discrimination is basically “profiling”.
- Individuals are evaluated on the basis of identifiable group (demographic) characteristics rather than solely on the basis of individual merit.
- Sufficiently high screening costs can lead to the practice of statistical discrimination.
- Examples are drawn from insurance rates, pension plans, labor markets.

Background

- Auto insurance premiums are higher in the U.S. for young men because of their unfavorable actuarial experience with automobile accident rates. (legal and socially acceptable)
- Lower monthly pension payments to women because they outlive men on average. (illegal in the U.S. and probably not socially acceptable)
- Women are paid less than men because employers may fear a higher absentee rate or more variable effort. (illegal in the U.S. and probably not socially acceptable)

Choose how much coverage you want.

(NOTE: This Offer is being made exclusively for qualified AAA Members and their spouses.)

Guaranteed low monthly premium

$5,000/$10,000*			$10,000/$20,000*			$15,000/$30,000*		
Age of Applicant	Male	Female	Age of Applicant	Male	Female	Age of Applicant	Male	Female
45-49	$17.75	$13.60	45-49	$34.60	$26.20	45-49	$51.90	$39.30
50-54	$21.00	$15.55	50-54	$41.00	$30.10	50-54	$61.50	$45.15
55-59	$24.50	$19.80	55-59	$48.00	$38.50	55-59	$72.00	$57.90
60-64	$29.70	$24.50	60-64	$58.40	$48.00	60-64	$87.60	$72.00
65-69	$37.10	$28.45	65-69	$73.20	$57.90	65-69	$109.80	$86.85
70-74	$48.75	$40.80	70-74	$98.50	$80.50	70-74	$147.75	$120.30
75-79	$74.75	$56.40	75-79	$148.50	$111.80	75-79	$222.75	$167.70

* Amount paid if your death is the result of a travel accident

AAA Life Insurance Company

17250 Newburgh Road
Livonia, Michigan 48152

Monthly premiums NEVER will go up, regardless of your age or physical condition.

Have a question?
Call the AAA Life Insurance Hotline toll-free:

1.800.684.4222

Background

- First moment variety

Two groups of workers differ in actual or perceived average productivity.

Employers will be indifferent in hiring if there is a wage differential that matches the actual or perceived average productivity differential.

- Second moment variety

Two groups of workers with the same average productivity differ in the actual or perceived variance of productivity.

Risk averse employers will be indifferent in hiring if there is a wage differential that compensates for the actual or perceived difference in the variance of productivity.

Motivation for experimental study

- It is difficult to identify statistical discrimination in naturally occurring labor markets.
- Statistical discrimination of the second moment variety is particularly subtle in field data sets pertaining to labor markets.
- Agents may perceive risk differently from economists and statisticians, e.g. loss aversion, distribution support as opposed to variance.

Experimental Design

- Wage contracts are made in advance of the productivity draw for each worker hired.
- There are four rounds for each treatment.
- Treatments are randomly ordered across 7 independent experimental sessions with different sets of subjects.
- The productivity distribution for each treatment is common knowledge for all subjects.

Experimental Design

- Double-auction labor markets with “open pit” trading.
- In any given session, there were 5 subject employers and 10 subject workers.
- Employer/worker assignments were made randomly and were fixed for the duration of an experimental session.
- Each employer could hire at most 1 worker in a given round, hence there are always at least 5 unemployed workers.
- Each worker is offered the same lower bound compensation (0.40 experimental dollars) in the event that the worker is unemployed.
- The productivity distribution of the labor pool differs across 4 treatments, but average productivity is a constant 3.0 across all 4 productivity variance treatments.
- Each unit of output is worth 1 experimental dollar to an employer .
- The employer’s profit is (output price x worker productivity) – wage cost.

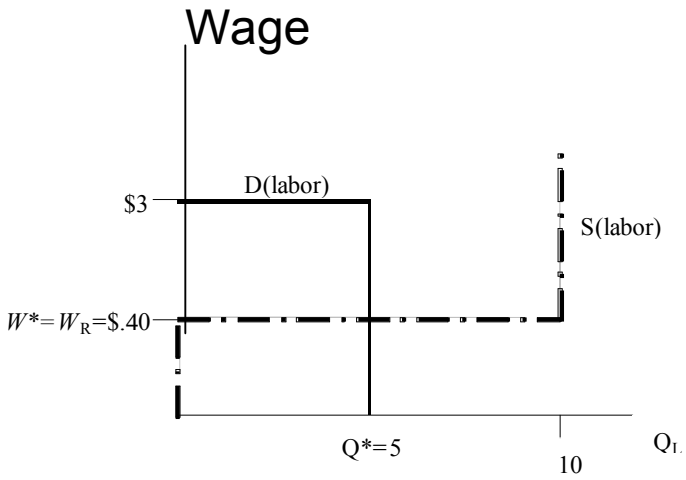

FIGURE 1: Experimental Design

TABLE 1

Experiment Treatment Design

Treatment	*Description* Productivity (probability)	Productivity Mean	Productivity Variance	Productivity distribution support	Likelihood of Productivity < mean productivity
1	3 (1.00)	3	0	3	0
2	1,2,3,4,5, (.1,.1,.6,.1,.1)	3	1	1-5	.20
3	1,2,3,4,5, (.2,.2,.2,.2,.2)	3	2	1-5	.40
4	2,4 (.5,.5)	3	1	2-4	.50

Experimental results

Specification of the wage contract model

$$W_{it} = \alpha + T_{2it}\delta_2 + T_{3it}\delta_3 + T_{4it}\delta_4 + R_{2it}\gamma_2 + R_{3it}\gamma_3$$

$$+ R_{4it}\gamma_4 + TO_{2it}\delta_2 + TO_{3it}\delta_3 + TO_{4it}\delta_4 + \varepsilon_{it}$$

W_{it} = wage contract negotiated by employer `i` in period `t`

$T_{2it}, T_{3it}, T_{4it}$ are treatment indicators

$R_{2it}, R_{3it}, R_{4it}$ are round indicators

$TO_{2it}, TO_{3it}, TO_{4it}$ are treatment order indicators

TABLE 2
Wage Contracts
(Random Effects)

	Full Employer Sample		Male Employer Sample		Female Employer Sample	
Variable	Coef	std. error	Coef	std. error	Coef	std. error
Constant	0.861	0.038***	0.906	0.061***	0.812	0.050***
T2	-0.003	0.029	-0.063	0.042	0.048	0.042
T3	-0.028	0.036	-0.069	0.049	0.012	0.052
T4	-0.062	0.029**	-0.116	0.044***	-0.027	0.039
Round 2	-0.119	0.028***	-0.116	0.039***	-0.121	0.039***
Round 3	-0.143	0.028***	-0.153	0.039***	-0.135	0.039***
Round 4	-0.149	0.028***	-0.167	0.039***	-0.135	0.039***
TO2	-0.181	0.034***	-0.154	0.048***	-0.193	0.048***
TO3	-0.183	0.029***	-0.193	0.042***	-0.153	0.041***
TO4	-0.186	0.029***	-0.177	0.044***	-0.172	0.040***
R^2	0.137		0.168		0.123	
Nobs	560		240		320	

** and *** indicate significance at the 0.10, 0.05, and 0.01 levels, respectively, for the two-tailed test.

Conclusions

- Statistical discrimination is manifest by the tendency for wage contracts to be lowered in the presence of increasing combinations of riskiness in productivity distributions.
- With hindsight, we were able to construct additional discrete productivity distributions that allow for separate effects of variance, support, and loss aversion.