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Employer Rents Received by Hiring Vocationally-Trained or Experienced Workers

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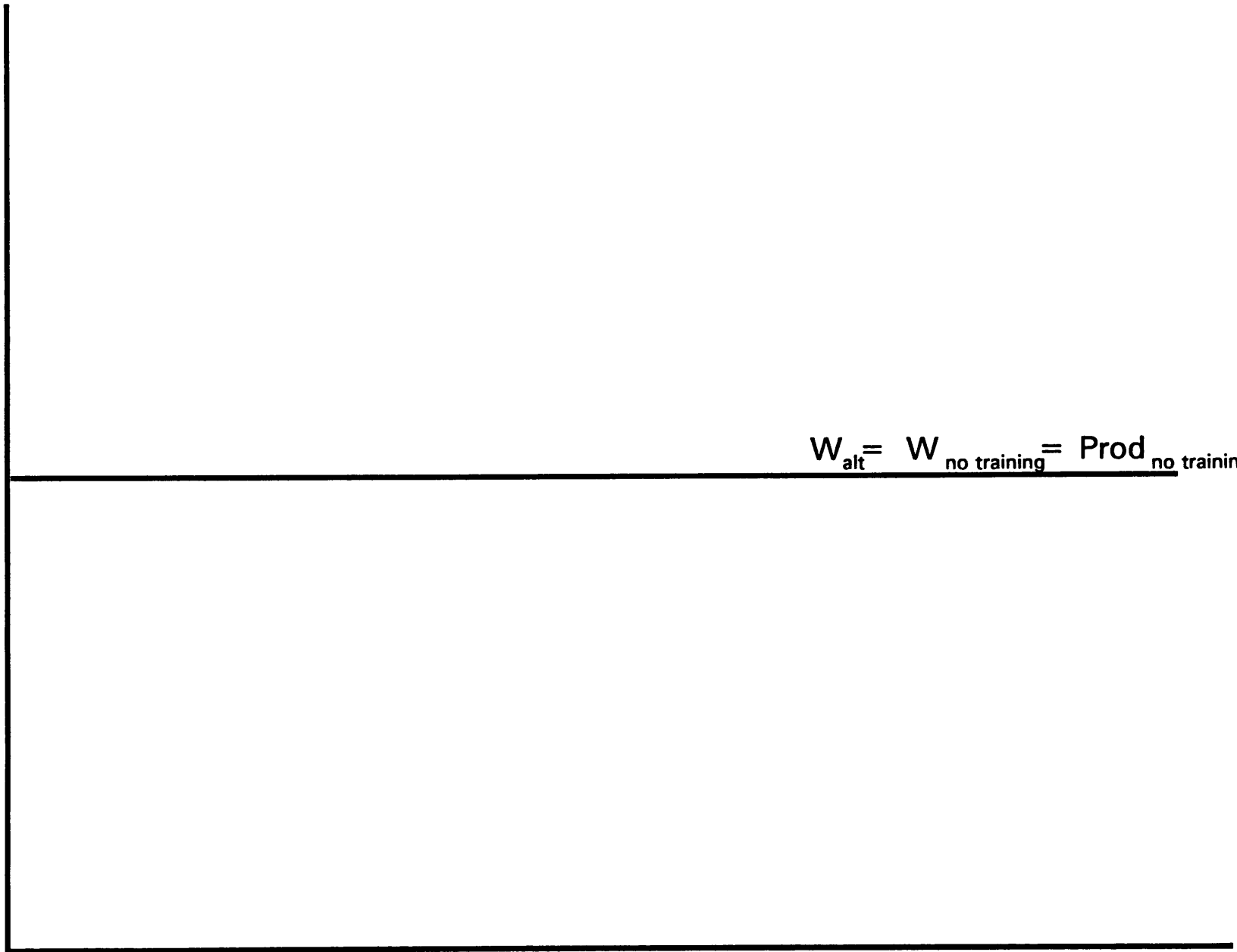
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**EMPLOYER RENTS RECEIVED BY HIRING VOCATIONALLY-TRAINED
OR EXPERIENCED WORKERS**

Handouts

September 14, 1995

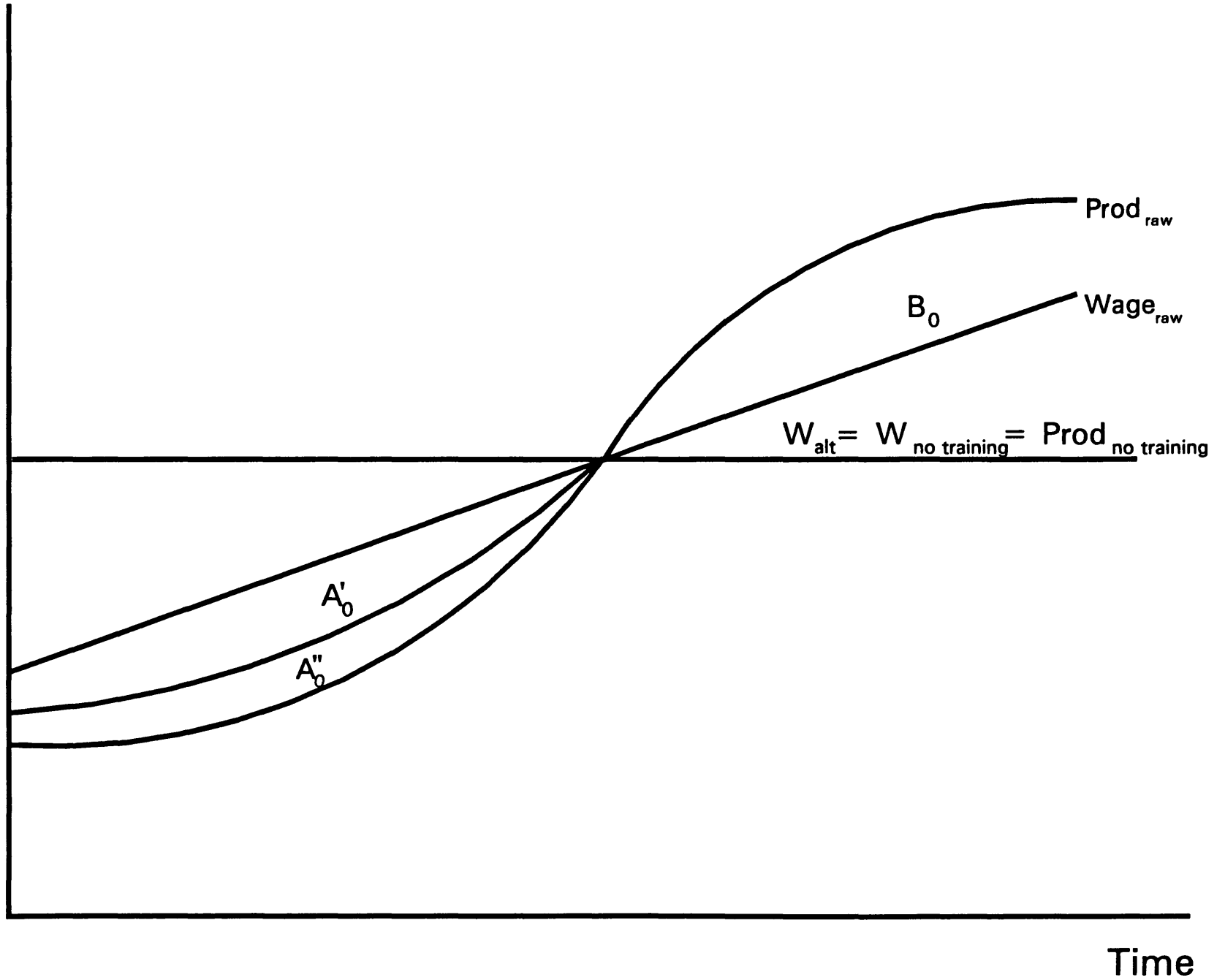
Real Wage, Productivity



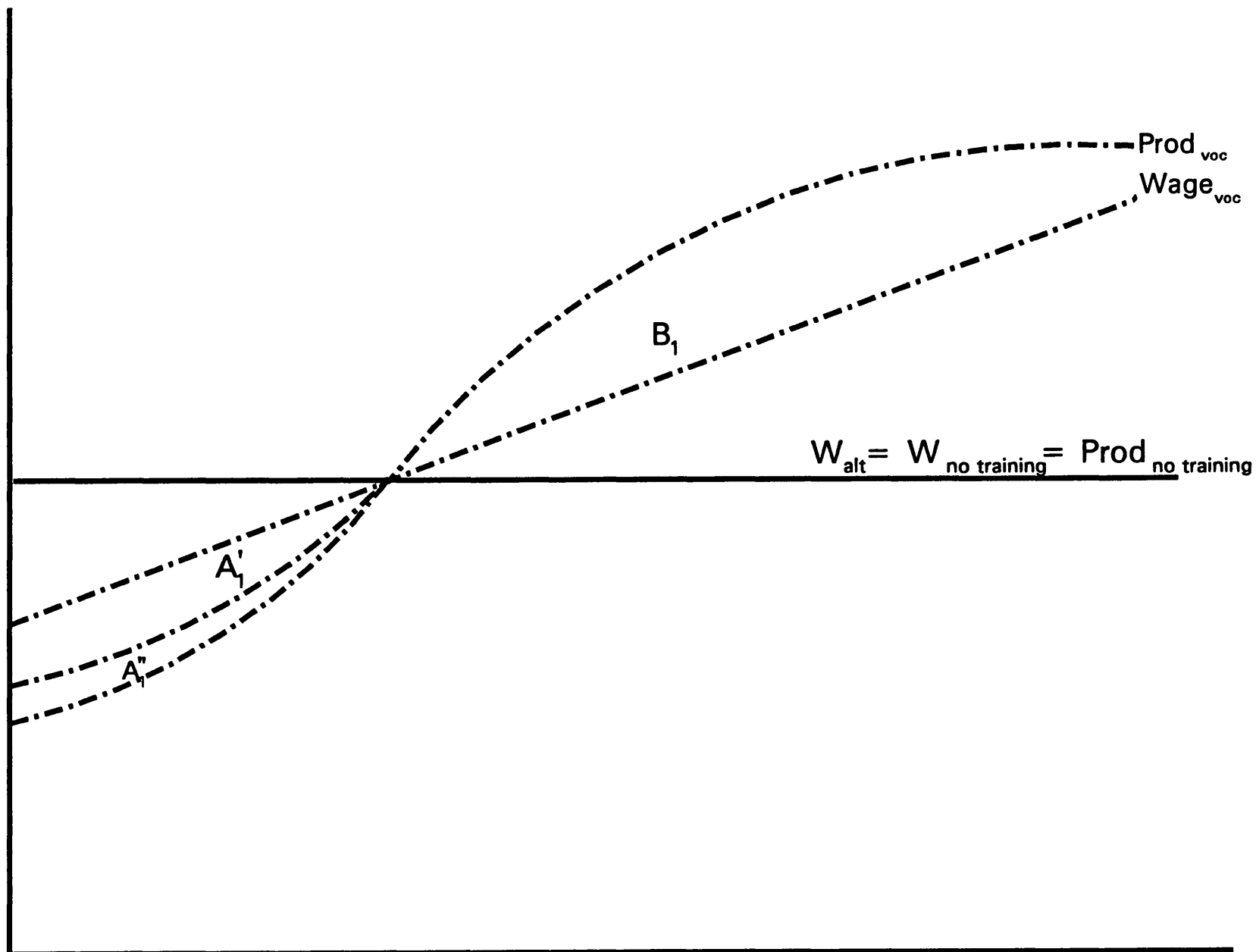
$$W_{alt} = W_{no\ training} = Prod_{no\ training}$$

Time

Real Wage, Productivity

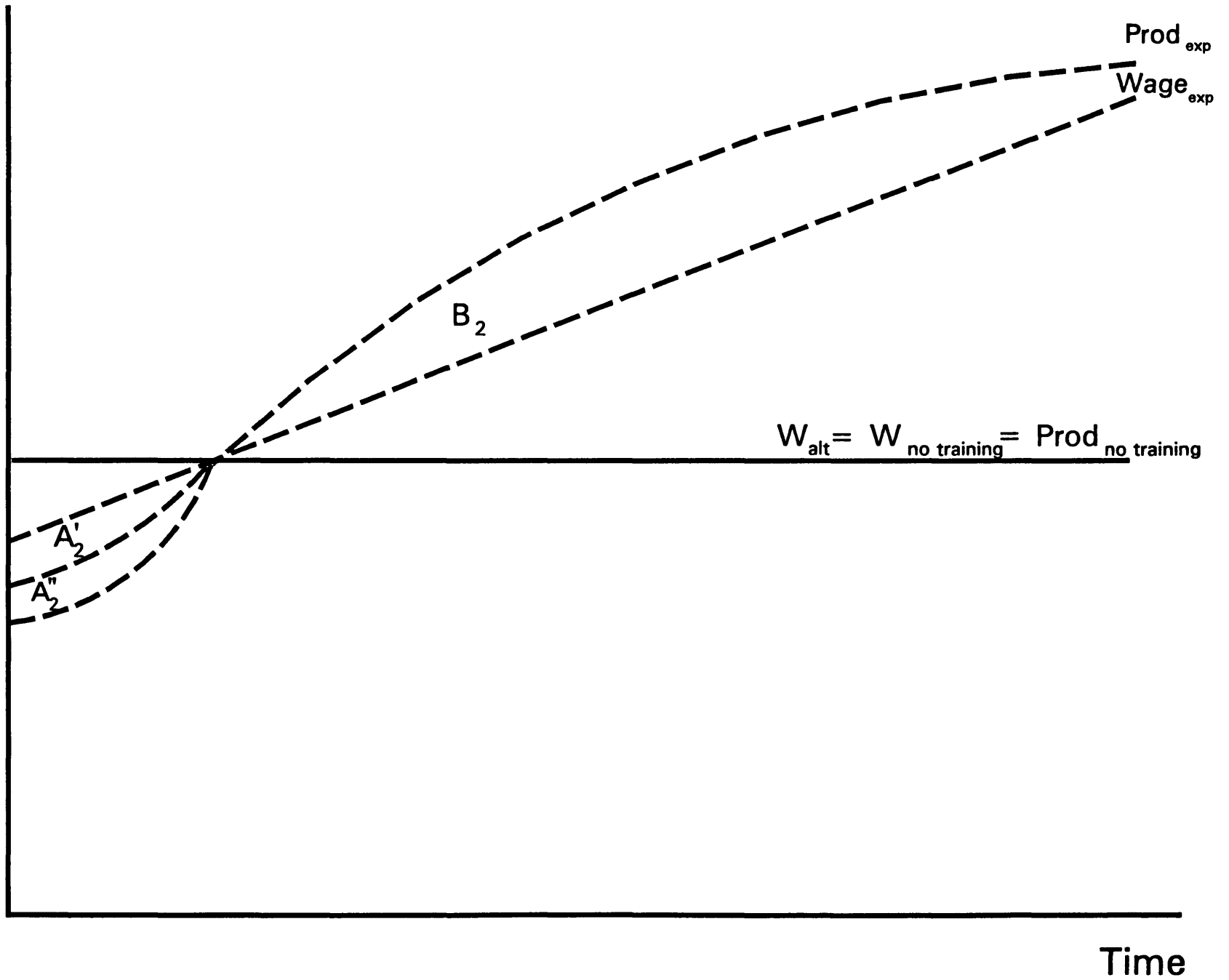


Real Wage, Productivity

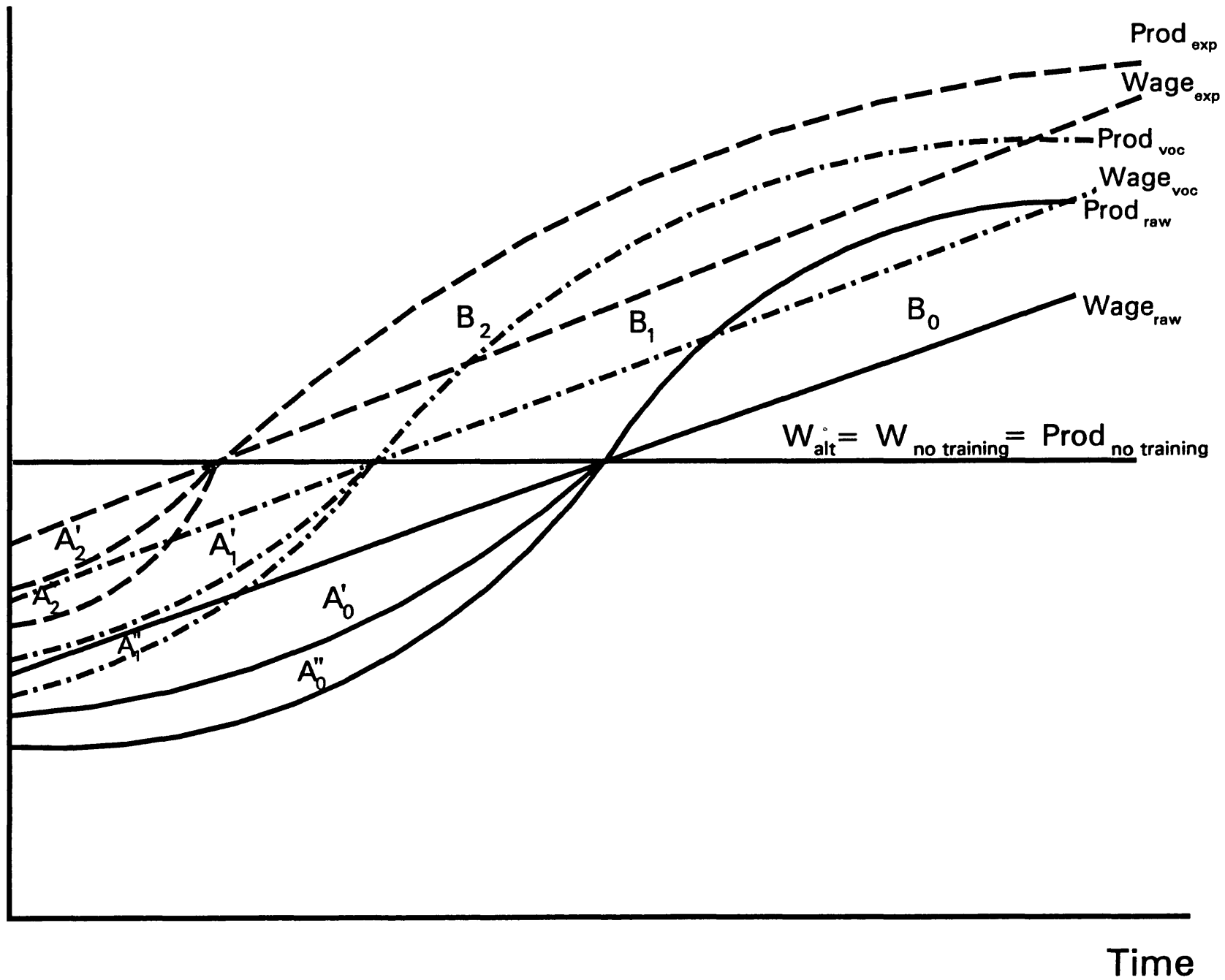


Time

Real Wage, Productivity



Real Wage, Productivity



Hypotheses

MAIN: Employer payoff_{exp} > Employer payoff_{voc} > Employer payoff_{raw}

SUBSIDIARY:

- 1) Training time_{raw} > Training time_{voc} > Training time_{exp}
- 2) Trainee cost_{raw} > Training cost_{voc} > Training cost_{exp}
- 3) Initial wage_{exp} > Initial wage_{voc} > Initial wage_{raw}
- 4) Initial prod_{exp} > Initial prod_{voc} > Initial prod_{raw}
- 5) Tenured wage_{exp} - Tenured wage_{raw} < Tenured wage_{exp} - Initial wage_{raw}
 Tenured wage_{voc} - Tenured wage_{raw} < Initial wage_{voc} - Initial wage_{raw}
- 6) Tenured prod_{exp} - Tenured prod_{raw} < Initial prod_{exp} - Initial prod_{raw}
 Tenured prod_{voc} - Tenured prod_{raw} < Initial prod_{voc} - Initial prod_{raw}

SURVEY OF EMPLOYERS
for the Congressionally-mandated
NATIONAL ASSESSMENT OF VOCATIONAL EDUCATION

Conducted by:

Westat, Inc.

for

The U.S. Department of Education
Office of Educational Research and Improvement

This information is solicited under the authority of Public Law 101-392, Section 403. All information you provide will be used for statistical purposes only. While you are not required to respond, your cooperation is needed to make the results of this survey comprehensive and accurate; statistically summarized results will be reported to the U.S Congress.

All questions in this questionnaire refer only to the single physical location of your establishment listed on the label below. If any information on this label is incorrect or if you have any questions about this survey, please call the Employer Survey Information Line toll-free at 1-800-937-8288.

LABEL HERE

Public reporting burden for this collection of information is estimated to average 70 minutes per response, including the time for reviewing instructions, searching existing data sources, gathering and maintaining the data needs, and completion and reviewing the collection of information. Send comments regarding this burden estimate or any other aspect of this collection of information including suggestions for reducing this burden to the U.S. Department of Education, Information Management and Compliance Division, Washington, D.C. 20202-4651; and to the Office of Management and Budget, Paperwork Reduction Project 1850-0684, Washington, D.C. 20503.

11. Please give us your best estimate of this establishment's total expenditures on formal and informal training of employees (including contract workers) in:

- a. 1992? \$ _____
- b. 1990? \$ _____

12. What percentage of the personnel in the following occupational classes received formal or informal training in each of these years (including contract workers)?

	<u>1992</u>	<u>1990</u>
a. Managers/supervisors	_____ %	_____ %
b. Production workers	_____ %	_____ %
c. Other workers	_____ %	_____ %

13. What was the establishment's profit or loss as a percent of sales for 1990 and 1992? For each year, indicate profit or loss and translate your amount of profit or loss into a percent of sales.

IF THIS IS A NON-PROFIT ESTABLISHMENT, PLEASE CHECK THE BOX AND SKIP TO Q.14 ...

<u>1992</u>		<u>1990</u>	
a. PROFIT	1	b. PROFIT	1
LOSS	2	LOSS	2
_____	% OF THIS	_____	% OF THIS
	ESTABLISHMENT'S SALES		ESTABLISHMENT'S SALES

14. Many U.S. businesses are engaged in transforming their workplaces and reorganizing work. We are interested in the extent to which your establishment may be engaging in these types of activities. For each of the following activities, please indicate whether or not this establishment has undertaken the activity, when the activity was begun, and how actively the establishment has engaged in the activity. Use a scale from 1 (not very actively) to 5 (very actively). If you are unfamiliar with any activity, please circle "3" in column I (Don't Know) and go to the next activity.

<u>ACTIVITY</u>	<u>I.</u> <u>ACTIVE?</u>			<u>II.</u> <u>YEAR</u> <u>BEGUN</u>	<u>III.</u> <u>HOW</u> <u>ACTIVE?</u>				
	YES	NO	DK		NOT VERY		↔	VERY ACTIVE	
a. Employee profit sharing	1	2	3	19__	1	2	3	4	5
b. Total Quality Management (TQM)	1	2	3	19__	1	2	3	4	5
c. Just-in-time (JIT) or synchronous production	1	2	3	19__	1	2	3	4	5
d. Self-managed teams	1	2	3	19__	1	2	3	4	5
e. Integrated quality control into production (SPC)	1	2	3	19__	1	2	3	4	5
f. Increased responsibility for all workers (empowerment)	1	2	3	19__	1	2	3	4	5
g. Mentoring/apprenticeship	1	2	3	19__	1	2	3	4	5
h. Reduction of middle-management	1	2	3	19__	1	2	3	4	5

33. We are interested in your assessment of the skills of new entrants to the workforce, particularly as compared to your more experienced workers in the same kind of job. For each of the following skills, please estimate what percentage of your more experienced workers (in Column I) and what percentage of your new entrants (in Column II) have some deficiencies. ("Deficiencies" are defined as problems that cause the workers to be less productive than they otherwise would be.)

<u>AREA OF DEFICIENCY</u>	I. MORE EXPERIENCED <u>WORKERS</u>	II. NEW <u>ENTRANTS</u>
a. Literacy	_____ %	_____ %
b. Basic math/computation/measuring	_____ %	_____ %
d. Speaking/communication skills	_____ %	_____ %
e. Computer literacy/applications	_____ %	_____ %
f. Reasoning/problem solving	_____ %	_____ %
g. Technical/occupational skills	_____ %	_____ %
h. Responsibility/work ethic	_____ %	_____ %

SECTION D: LAST WORKER HIRED

We'd like to ask you to think of the last new employee hired to work here prior to November 1, 1992. This employee could be in a non-managerial or a management position, and need not be currently employed here. All questions in this section of the questionnaire refer to this person.

34. To make it easier to refer to him or her during the interview, please give us his or her FIRST name and gender.

NAME 1: _____ GENDER: MALE 1
FEMALE 2

35. What is the title of the job (NAME 1) was hired for? What are the most important duties of the job?

Title: _____

Duties: _____

36. How many of the skills learned on-the-job by new employees in (NAME1's) job are useful outside of this company?

CIRCLE ONE NUMBER

- Almost all 1
- Most 2
- Some 3
- Almost none 4

37. In what month/year did (NAME 1) begin working for your company?

_____/_____
MONTH YEAR

38. What was (NAME 1's) age at the time (he/she) was hired?

AGE AT HIRE: _____

57. The following questions ask for comparisons among (NAME 1) and (NAME 2) and your typical employee in the same position concerning the type of training received, and the amount of training in hours.

	(NAME 1) HOURS:	(NAME 2) HOURS:	TYPICAL WORKER HOURS:
a. During the first 3 months of work, what was the total number of hours spent on <u>formal</u> training such as <u>self-paced learning</u> programs or training done by specially trained personnel?	_____	_____	_____
b. How about <u>informal</u> training given by <u>management</u> or line supervisors?	_____	_____	_____
c. Informal training given by <u>co-workers</u> who are not supervisors (e.g., job shadowing)?	_____	_____	_____

58. For (NAME 1), (NAME 2), and your typical worker, please rate their skills at the time of hiring on a scale of zero to 100, where 100 equals the maximum skill level any employee in this position could ever possess and zero indicates absolutely no skill.

	(NAME 1) RATING:	(NAME 2) RATING:	TYPICAL WORKER RATING:
a. Technical skills (e.g., machining, keyboarding, operating job-specific equipment)	_____	_____	_____
b. Basic academic skills (e.g., reading, math, writing)	_____	_____	_____
c. Employability skills (e.g., interpersonal skills, team work, communication)	_____	_____	_____

59. Please rate these same employees' skills now, on a scale of zero to 100, where 100 equals the maximum skill level any employee in this position could ever possess and zero indicates absolutely no skill.

	<u>(NAME 1)</u> RATING:	<u>(NAME 2)</u> RATING:	TYPICAL WORKER RATING:
a. Technical skills (e.g., machining, keyboarding, operating job-specific equipment)	_____	_____	_____
b. Basic academic skills (e.g., reading, math, writing)	_____	_____	_____
c. Employability skills (e.g., interpersonal skills, team work, communication)	_____	_____	_____

60. Please rate these employees on a productivity scale of zero to 100, where 100 equals the maximum productivity any employee in this position can attain and zero indicates absolutely no productivity.

	<u>(NAME 1)</u> RATING:	<u>(NAME 2)</u> RATING:	TYPICAL WORKER RATING:
a. What productivity rating would you give each of these workers <u>during their 1st two weeks</u> on the job?	_____	_____	_____
b. How would you rate them during their first 3 months, but after that initial 2 weeks (i.e., weeks 3-12)?	_____	_____	_____
c. How would you rate them today? (or last week of employment if they no longer work here.)	_____	_____	_____

	<u>(NAME 1)</u>	<u>(NAME 2)</u>	TYPICAL WORKER
61. a. What would be the starting hourly rate paid to workers in <u>(NAME 1 or NAME 2's)</u> position, if you hired them today? (include commissions, bonuses, etc.)	\$ _____	\$ _____	\$ _____
b. What is the current wage rate, after two years on the job, of workers doing the same kind of work that these workers do?	\$ _____	\$ _____	\$ _____

EMPIRICAL MODELS

$$(1) \quad Y_{ij} = \beta X_{ij} + \gamma Z_j + e_{ij}$$

i - individual; j - firm

$$(1') \quad Y_{ij} = \beta X_{ij} + \gamma Z_j + v_j + u_{ij}$$

$$(2) \quad Y_{1j} - Y_{2j} = \beta(X_{1j} - X_{2j}) + (u_{1j} - u_{2j})$$

Y

cost of training
productivity ratings
wages (log)

X

sex
educ. years
voc.
skill levels at hiring
experience
relevant voc.

Z

size
larger
unionization
industry
profit
hpwo

Cost of Training Measure 1 = Total Dollar Cost

	(1)	(2)	(3)
Has vocational training	-280.47* (167.04)	-112.90 (162.06)	30.18 (50.84)
Relevant training	131.66 (205.48)	169.19 (181.09)	-6.21 (68.18)
Experience	3.70* (1.97)	0.22 (2.58)	-2.96*** (1.06)
Experience ²	-0.011 (0.008)	0.0025 (0.0101)	0.0079** (0.0036)
Percent Impact			
Relevant Voc.	-10.7%	4.5%	1.9%
5 years experience	11.3%	2.5%	-11.80%
Mean dependent	1391.55	1264.20	18.72
Sample size	1515	479	336
\bar{R}^2	0.1137	0.0949	0.0275

Cost of Training Measure 2 = Indirect Cost = Reduced
Productivity of Managers and Co-Workers

	(1)	(2)	(3)
Has vocational training	-0.009 (0.018)	-0.020 (0.025)	-0.001 (0.009)
Relevant training	0.023 (0.022)	0.031 (0.027)	-0.000 (0.012)
Experience	-0.00027 (0.00021)	-0.00038 (0.00039)	-0.00027 (0.00019)
Experience ²	0.0000003 (0.0000008)	0.0000012 (0.0000015)	0.0000007 (0.0000006)
Percent Impact*			
Relevant Voc.	7.8%	3.3%	0.5%
5 years experience	-1.5%	-1.9%	-1.4%
Mean dependent	0.180	0.184	-0.0005
Sample size	1660	505	360
\bar{R}^2	0.0115	0.0135	-0.0155

*As a percentage of three months productivity of typical worker with two years tenure.

Productivity at 3-months

	(1)	(2)	(3)
Has vocational training	0.398 (1.460)	2.623 (1.828)	1.449 (1.042)
Relevant training	2.249 (1.778)	-0.360 (2.000)	1.517 (1.373)
Experience	0.049*** (0.017)	0.045 (0.033)	0.043* (0.023)
Experience ²	-0.00012* (0.00007)	-0.00022 (0.00014)	-0.000088 (0.000081)
Percent Impact*			
Relevant Voc.	3.2%	2.7%	3.5%
5 years experience	3.0%	2.3%	2.7%
Mean dependent	72.41	72.28	3.42
Sample size	1806	546	401
\bar{R}^2	0.1740	0.3008	0.3203

*As percentage of three months productivity of typical worker with two years tenure.

Starting Wage

	(1)	(2)	(3)
Has vocational training	-0.108*** (0.029)	-0.065** (0.033)	-0.014 (0.012)
Relevant training	0.115*** (0.035)	0.065* (0.036)	0.016 (0.016)
Experience	0.00451*** (0.00034)	0.00347*** (0.00052)	0.00092*** (0.00026)
Experience ²	-0.0000094*** (0.0000013)	-0.0000080*** (0.0000020)	-0.0000018** (0.0000009)
Percent Impact			
Relevant Voc.	0.7%	0.0%	0.2%
5 years experience	23.7%	17.9%	4.9%
Mean dependent	2.16	2.11	0.013
Sample size	1791	551	402
\bar{R}^2	0.4931	0.4100	0.1508

Employer Rents

	Relevant voc. ed.	5-years experience	Both
Reduced indirect training cost	-0.5%	1.4%	0.9%
Increased productivity & reduced direct training cost	3.5%	2.7%	6.2%
(Minus) Increased starting wage	<u>-0.2%</u>	<u>-4.9%</u>	<u>-5.1%</u>
TOTAL	2.8%	-0.8%	2.0%

NAVE Paper Outline

1. INTRODUCTION

The purpose of this paper is to estimate the externalities received by employers who hired new employees with relevant vocational education and with prior experience.

Bishop's work suggests that the externality to relevant vocational education is around 5% of 3 month's output by worker with 2 year's tenure (approx. = 5% of 12500 = \$625.) However for worker with 5 years of relevant experience the payoff is 10% (1250). This suggests that employers are quite rational to hire experienced workers over relevant voc. workers over neither.

The externality comes from lower training costs, greater productivity, but nets out higher wages.

This paper reproduces Bishop's results using a different data set and uses an alternative estimation technique on both data sets. The fundamental result stands. Employers receive a significant payoff from hiring workers with relevant prior experience or relevant voc. ed.

A question that arises from the results is why don't the new hires with experience or education reap a larger share of the externality or rent. Potential reasons are information asymmetries, mobility constraints, and monopsony.

Policy implications are that education is not enough; experience is far more valuable. Searchers are not adequately selling their experience. Education needs to be more work-based.

The rest of the paper.

2. MODEL

Specific training model.

Hypotheses: Extern (experience) > extern (voc. ed.) > 0
Training time less
Training expense less
wages higher
wages converge
productivity higher
productivity converges

3. DATA

NAVE survey.

EOPP survey.

4. RESULTS

Training time and training costs, by experience and by relevant voc. ed. 3 months only. Descriptive stats and regressions.

Higher productivity. This paper uses the productivity index concept. It may be quite misleading, but assumes that respondents scales output with random error. Descriptive stats and regression.

Higher wages.

5. SUMMARY AND CONCLUSIONS