AD-A054 423 PUBLIC RESEARCH INST ARLINGTON VA F/G 5/3
THE DISTRIBUTIONAL EFFECTS OF UNEMPLOYMENT INSURANCE.(U)
SEP 77 K P CLASSEN
UNCLASSIFIED PRI-PP-198 NL

END
DATE FILMED
6 -78
DDC

The Distributional Effects of Unemployment Insurance

Kathleen P. Classen

PUBLIC RESEARCH INSTITUTE
a division of the Center for Naval Analyses

INDEX TO PRI PUBLICATIONS

73-1 *The Retail Price of Heroin: Estimation and Applications,* George Brown, and Lester Silverman; May 1973.

73-2 *The Use of Longitudinal Data to Assess the Impact of Manpower Training on Earnings,* Louis Jacobson; July 1973.

73-3 *The Determinants of Daily Emergency Admissions to Hospitals* Lester Silverman; July 1973.

74-1 *The Effect of Unemployment Insurance and Eligibility Enforcement on Unemployment,* Arlene Holen, and Stanley Horowitz; April 1974.

74-2 *Undiagnosed Bacterial Meningitis in Vermont Children,* Lester Silverman, et al.; October 1974.

75-1 *Urban Crime and Heroin Availability,* Lester Silverman, Nancy Spruill, and Daniel Levine; April 1975.

75-2 *Removing Restrictions on Imports of Steel,* James Jondrow, Eugene Devine, Louis Jacobson, Arnold Katz, David O'Neill; May 1975.

75-3 *Abolishing the District of Columbia Motorcycle Squad,* Abram N. Shulsky; April 1975.

75-4 *Public Drug Treatment and Addict Crime,* Peter Stoloff, Daniel B. Levine, Nancy Spruill; October 1975.

75-5 *Unemployment Insurance Taxes and Labor Turnover: Summary of Theoretical Findings,* Frank Brechling; December 1975.

40-74 *Summary of Statement and Remarks at the Conference on Study of the Unemployment Insurance System, Arlington, Virginia, January 25, 1974,* April 1974.

112-74 *Unemployment Insurance and Eligibility Enforcement,* Stanley Horowitz, and Arlene Holen; December 1974.

130-75 *Effects of the 1974 UI Extensions on Unemployment,* David M. O'Neill, Kathleen P. Classen, and Arlene Holen; December 1974.

173-75 *The Incentive Effects of the U.S. Unemployment Insurance Tax,* Frank Brechling; June 1975.

184-75 *An Evaluation of Proposed Alternatives for Increasing UI Tax Revenues,* Christopher Jehn; May 1975.

186-75 *The Effects of Unemployment Insurance on the Duration of Unemployment and Job Search,* Kathleen P. Classen; June 1973.

196-75 *Report of the Ocean Policy Research Workshop,* Robert L. Friedheim, Judith T. Kildow; February 1975.

197-75 *Earnings Losses of Workers Displaced from the Steel Industry by Imports of Steel,* Louis Jacobson; August 1975.

199-75 *Alternative Data Sources for Analysis of Unemployment Insurance,* Louis Jacobson; July 1975.

211-75 *The Effect of Unemployment Insurance on the Duration of Unemployment and Subsequent Earnings,* Kathleen Classen; September 1975.

239-75 *Discrimination Against Handicapped Persons: The Costs, Benefits and Inflationary Impact of Implementing Section 504 of the Rehabilitation Act of 1973 Covering Recipients of HEW Financial Assistance,* Dave O'Neill; February 1976.

260-76 *The Effects of Effluent Discharge Limitations on Foreign Trade in Selected Industries,* James Jondrow, David Chase, Christopher Gamble, Nancy Spruill; February 1976.

262-76 *Reducing the Burden of Federal Reporting: A Proposal,* Paul Feldman; February 1976.

264-76 *The Labor Market Effects of Unemployment Insurance: Summary of Findings,* Christopher Jehn; March 1976.

279-76 *The Measurement and Prediction of Reporting Costs,* David E. Chase and Daniel B. Levine; May 1976.

312-76 *Voucher Funding of Training: A Study of the G.I. Bill,* David O'Neill and Sue Goetz Ross; October 1976.

CRC-308 *An Evaluation of the GNP Deflator as a Basis for Adjusting the Allowable Price of Crude Oil,* James M. Jondrow and David E. Chase, February 1977.

CRC-313 *Losses to Workers Displaced by Plant Closure or Layoff: A Survey of the Literature,* Arlene Holen, November 1976.

CRC-315 *Shipyard Worker Employment and Turnover,* 2 Volumes, Louis S. Jacobson, November 1976.

CRC-324 *To Satisfy Demand: A Study Plan For Public Library Service in Baltimore County,* Vernon E. Palmour and Marcia C. Bellassai, June 1977.

PP 165 *Effects of Trade Restrictions on Imports of Steel,* James M. Jondrow, November 1976.

PP 166 Revised *Why It's Difficult to Change Regulation* Paul Feldman, October 1976.

PP 169 *Earnings Losses of Workers Displaced from Manufacturing Industries,* Louis S. Jacobson, November 1976.

PP 170 *A Time Series Analysis of Labor Turnover,* Frank P. Brechling, November 1976.

PP 172 *Unemployment Insurance and the Length of Unemployment,* Kathleen P. Classen, December 1976.

PP 175 *Public Drug Treatment and Addict Crime,* D. B. Levine, N. Spruill, and P. H. Stoloff, March 1977.

PP 192 *Effects of Unemployment Insurance Entitlement on Duration and Job Search Outcome,* Arlene Holen, August 1977.

PP 193 *A Model of Unemployment Insurance and the Work Test,* Stanley A. Horowitz, August 1977.

PP 194 *The Effect of Unemployment Insurance on the Duration of Unemployment and Subsequent Earnings,* Kathleen P. Classen, August 1977.

PP 195 *Unemployment Insurance Taxes and Labor Turnover: Summary of Theoretical Findings,* Frank Brechling, August 1977.

PP 198 *The Distributional Effects of Unemployment Insurance,* Kathleen P. Classen, September 1977.

PP 202 *Why Regulation Doesn't Work,* Paul Feldman, September 1977.

PP 203 *Efficiency, Distribution, and the Role of Government in a Market Economy,* Paul Feldman, September 1977.

THE DISTRIBUTIONAL EFFECTS OF UNEMPLOYMENT INSURANCE

Kathleen P. Classen

32 p.

Professional Paper No. 198

Sep[redacted]77

Paper presented at The Hoover Institution
Conference on Income Distribution
October 7-8, 1977

PRI-PP-198

ACKNOWLEDGMENTS

This paper was prepared under a grant from the Hoover Institution on War. Revolution and Peace. The author wishes to thank Arlene Holen of the Center for Naval Analyses, who provided many good ideas and useful comments.

TABLE OF CONTENTS

	Page
Introduction	1
Who gets UI?	1
How much UI?	5
Who pays for UI?	6
The UI tax system	6
Do workers pay for UI benefits?	7
Combined effects of the interfirm subsidy and wage displacement	11
The effects of UI on business cycles: UI as a counter-cyclical tool	14
Conclusion	21
References	22

INTRODUCTION

On the surface, Unemployment Insurance (UI) appears to have a significant impact on the distribution of income. In fiscal 1976, payments under all unemployment compensation programs totaled close to $20 billion, more than the combined payments under Aid to Families with Dependent Children (AFDC) and the Food Stamp program.* Moreover, UI provides benefits to those who have lost their labor income, and labor income is the major determinant of the income distribution in the United States.

The reality behind this appearance is the subject of this paper. Using several sources of data we find that although low income families get very little in the way of UI benefits, their share of UI benefits is greater than their share of income from other sources. Thus, based on the distribution of benefits, UI appears to equalize income.

The distribution of UI benefits is, however, only part of the story. The net impact of the UI program on the distribution of income depends on not only who gets UI but also who pays for it. We present evidence that wages adjust, at least to some extent, to levels of unemployment insurance. If wages do fall when UI is increased, this market adjustment mitigates the equalizing effect of UI receipts.

Aside from the direct effect of UI on the income of the unemployed, UI is believed to have a counter-cyclical effect which, if true, would have important distributional implications. If UI really does lessen the severity of recessions, it will increase the equality of income because lower income groups suffer the biggest loss in income during a recession.** UI benefit payments do exceed tax collections in a recession, and vice-versa in a boom period. In this sense UI is counter-cyclical. But for UI to be counter-cyclical in the sense that it alters the severity of recessions, it must alter the expenditure patterns of the unemployed. We present evidence in this paper that UI does not alter the expenditures of the unemployed; UI appears to have a larger impact on savings patterns. Again, as in the case of the direct effect of UI, we find that there are long-run mechanisms which offset the apparent counter-cyclical effects of UI.

WHO GETS UI?

Eligibility for UI is determined by previous work experience. All states require some minimum level of earnings previous to unemployment before any benefits are paid,

*There are several unemployment compensation programs: regular state UI; federal-state extended programs (EB, FSB); unemployment compensation for federal employees (UCFE); unemployment compensation for ex-military employees (UCX); federal coverage of workers not covered under other programs, (SUA); disaster unemployment assistance; Trade Adjustment Assistance (TAA); and railroad unemployment compensation. Total payments under major income transfer programs (1974-76) can be found in the Economic Report of the President, 1977 (table 22).

**See Gramlich [12].

and, in addition, many states require a minimum number of weeks or quarters of work.* The purpose of these requirements is to screen out claimants with marginal attachment to the labor force. Although it is doubtful that the minimum earning requirements, which are now on the order of about $600 in most states, really do accomplish this objective, they do screen out many of the poor because the poor are often those who never work.** They are often sick or old or they are single parents of young children. Whether these people would work if it were not for income transfer payments is not the issue here; the point is that since UI goes to those who have worked, it will not do a great deal to alleviate poverty. UI payments also do not go to those with high income, for two reasons: first, payments are contingent on unemployment and unemployment leads, at least temporarily, to reduced income. Second, high income workers are less likely to become unemployed because the incidence of unemployment falls as skill and tenure increase.

Table I shows the proportion of families in each income group who reported receiving UI benefits in 1972 in the March 1973 Current Population Survey (CPS). The numbers in the table understate the proportion actually receiving benefits because the CPS, which is the household survey used to generate nationwide unemployment statistics, suffers from an underreporting bias with respect to UI.*** If we assume that the amount of underreporting is not a function of income, then table I implies that there are differences in the relative probability of receiving UI across income groups: very low income families (<$3,000 per year) rarely received UI, and middle income families were about twice as likely to receive UI as families in the highest income bracket.

Table II reports unemployment and the receipt of UI for one type of family. It shows that although middle income families were more likely to receive UI than high income families (column 2), the probability that a spell of unemployment was compensated by UI increased with income (column 3). For these couples, UI receipt was least likely in the lowest and highest income groups. The incidence of UI, given unemployment, increases with income. The incidence of unemployment and UI receipt was tabulated by income group for every family type and the patterns were the same as those shown in table II; they did not depend on the presence of a spouse or children.****

The pattern of UI receipt may be partially explained by the fact that higher income families are more likely to meet the monetary eligibility requirements for UI, but it is primarily due to the differing causes of unemployment in the various income groups. Income tends to increase with age, so higher income households generally consist of older workers. Job loss among older workers is more likely to be involuntary than

*For a concise list of state UI provisions, see [22].
**See Palmer [18].
***See Classen [5] and Feldstein [9].
****An aggregation of all family types is misleading since the number of family members who work affects both the income of the family and the probability that at least one member will experience unemployment.

TABLE I

REPORTED INCIDENCE OF UI RECEIPT (1972)

FAMILY INCOME	PERCENT OF FAMILIES RECEIVING UI
$0-1000	1.0
1001-2000	1.6
2001-3000	2.6
3001-4000	5.0
4001-5000	6.2
5001-7500	6.5
7501-10,000	7.3
10,001-15,000	6.7
15,001-20,000	6.2
> 20,000	3.6

Source: March 1973 CPS Tapes

TABLE II

REPORTED INCIDENCE OF UNEMPLOYMENT AND RECEIPT OF UI (1972)
(Family type: Married couples - Both working - No children)

Income	Percent of families where either husband or wife experienced unemployment	Percent of families where either husband or wife received unemployment compensation	Probability that unemployment was compensated by UI
	(1)	(2)	(2 ÷ 1)
$0-1000	45.4	0	0
1001-2000	43.3	0	0
2001-3000	44.7	2.1	.048
3001-4000	32.2	10.0	.310
4001-5000	41.6	8.8	.210
5001-7500	28.9	9.4	.324
7501-10,000	28.3	12.4	.441
10,001-15,000	21.0	8.3	.398
15,001-20,000	12.1	8.3	.686
> 20,000	7.2	5.2	.723

Source: March 1973 CPS Tapes

among younger workers, and of course the young are more likely to be new entrants into the labor force. Although a few states pay benefits to those who voluntarily leave their jobs, after a waiting period, none provide benefits to new entrants or re-entrants to the job market who are unemployed while they search for work. The vast majority of UI recipients are temporarily unemployed victims of involuntary job loss. Among the unemployed, then, the older, higher income workers are more likely to qualify for UI.*

To check the distributional patterns of UI receipts against the patterns apparent in the CPS data, a random (6 percent) sample of claim histories and employer tax records in Pennsylvania were tabulated for individuals covered by UI. UI records are extremely accurate. They do not, however, cover people who never work, and since the unit of observation is the individual and not the family, these tabulations are not directly comparable to those shown in tables I and II.

Table III shows the distribution of all workers covered by the UI system and the distribution of claimants in Pennsylvania in 1967. The fraction of workers who collected UI is higher in this sample than it is for CPS families, but the general pattern is the same: middle income workers make up a disproportionate share of UI recipients.

UI records have another advantage aside from their accuracy: they allow us to examine the earnings of UI recipients in the year before they become unemployed. Compare the first and last columns of table III. Note that the low income groups show a substantial drop in earnings, probably because they contain workers who dropped out of the labor force in 1967. Except for those groups, unemployment does not appear to result in an income change for most workers even though the average duration of unemployment was over two months. Average incomes don't change much over the two years because many of the 1967 claimants were also unemployed in 1966. Some UI claimants collect benefits year after year.

Three years of claimant files in Pennsylvania were merged (1966, 1967, 1968) to allow analysis of repeat collection patterns. Over half the people who had a valid claim for unemployment insurance in 1968 also claimed in 1967 or 1966, and over 20 percent had claims in all three years. It seems reasonable to assume that for people who collect benefits year after year, unemployment does not really constitute a risk; it is a predictable event. For such workers, UI is not really an insurance program; it is part of the wage package.

*The distribution of total unemployment by age (see the yearly Work Experience of the Population, BLS) always has a larger fraction in the young groups than the distribution of UI recipients by age (see the monthly Unemployment Insurance Statistics, ETA).

TABLE III

DISTRIBUTION OF WORKERS AND CLAIMANTS

Pennsylvania - 1967

Annual earnings in covered employment--1967	All workers (percent)	Eligible claimants[a] (percent)	Claimants as a percent of covered workers	Average income of 1967 claimants in 1966
Total	100.0	100.0	7.9	
< $360	11.5	6.9	4.8	$3312
360-999	10.7	4.5	3.3	2198
1000--1999	11.0	13.8	9.9	2386
2000--2999	9.0	20.9	18.3	2653
3000--4999	18.1	29.4	12.8	3923
5000--6999	16.5	14.2	6.7	5860
≥ 7000	23.2	10.3	3.5	8270

[a] Those who filed and met minimum earnings requirements.

Source: Pennsylvania Continuous Wage and Benefit History Tapes

HOW MUCH UI?

Thus far, we have described only the likelihood that any UI is received. The amount of benefits that each worker gets will also affect the distribution of income.

In general, UI pays half of a claimant's previous wage up to a maximum amount. Because of this ceiling, high wage earners receive less than half their previous wage. Since high wage earners seldom claim UI, the average replacement rate for UI claimants is close to 50 percent. But, a dollar in UI benefits is worth more than a dollar in wages because UI is tax-free. UI as a fraction of net wages (wages minus taxes) usually averages about two-thirds for the claimant population. *

Table IV gives one calculation, based on work done by Martin Feldstein, of the distribution of UI payments in 1970. It shows that the distribution of the amount of UI collected by income group is very similar to the distribution of the number of UI recipients

*See Unemployment Compensation: A Background Report, Congressional Budget Office [6].

by income group.* The bottom half of the income distribution has less than half the recipients and it receives less than half the benefits. Although UI payments are not distributed proportionately across all income classes, they are distributed much more equally than income. Without considering who pays for UI, it appears that UI increases the equality of the income distribution in the U.S.**

TABLE IV

DISTRIBUTION OF UI
1970

Family income without UI	% Distribution of families	% Distribution of UI Recipients	% Distribution of UI payments	% Distribution of money income
$0 to 4,999	28	18	17	7
5,000 to 9,999	25	30	31	22
10,000 to 14,999	18	25	24	27
15,000 +	29	27	28	44
	100	100	100	100

Source: Calculated from Table II in "Unemployment Compensation: Adverse Incentives and Distributional Anomalies," by Martin Feldstein and the Statistical Abstract of the United States: 1972.

WHO PAYS FOR UI?

The UI Tax System

For most of its 42-year history, the UI system in the United States has paid UI benefits through a tax on employers.*** On the first $4,200 of each employee's wages, an

*The distribution of UI payments by income group was also equal to the distribution of UI recipients by income group in the Pennsylvania data.

**Table IV is based on a 1974 paper by Feldstein [9]. In this paper he used CPS responses, which were adjusted for underreporting by an imputation system developed at Brookings. In a 1977 paper [11], Feldstein uses the CPS and State UI provisions to estimate the actual receipt of benefits. These later estimates show a higher fraction of benefits going to lower income groups.

***The recent recession, however, is a significant exception. Many state funds and the federal unemployment tax accounts were entirely depleted. Loans to finance regular benefits and extended benefits were financed from general revenues. The liability for these loans has not been decided. Benefits to previously uncovered workers (SUA) are completely financed from general revenues.

employer pays .7 percent into the federal tax fund, which is used for loans to states and extended benefits, and an additional percentage into the state UI fund. The tax rate set by the state is based on the benefit collection experience of each firm. Employers with little turnover or few layoffs pay a low rate. All states, however, have a minimum and maximum tax rate; as a result, unstable employers, paying the maximum rate, consistently pay less in taxes than their employees receive in benefits, and very stable employers, paying at the minimum rate, pay more in taxes than their employees collect in benefits.

Although there is always variation in benefit payment experience within an industry, the industry to which a firm belongs is a good predictor of a firm's benefit to tax ratio in the state tax account. Construction firms are frequently responsible for benefit payments that are over twice their tax payments, while the finance industry, on the other hand, is usually responsible for benefits that equal only half the taxes it pays.*

Table V shows, for selected industries in Pennsylvania in 1967, that some industries accounted for a disproportionate share of UI claimants, that is, claimants in these industries exceed their proportion in the labor force. In addition, many of the same industries accounted for benefit payments in excess of taxes they paid. The outcome of these industry tax patterns is an interfirm subsidy, with stable firms subsidizing unstable firms. The effect is like a payroll tax on stable firms and a payroll subsidy for unstable firms, resulting in reduced equilibrium levels of employment in stable firms and increased employment in unstable firms. The distribution of income is probably not changed very much, but the interfirm subsidy does increase the level of unemployment since it shifts employment toward industries with frequent layoffs.**

Do Workers Pay for UI Benefits?

A key question in determining the net effect of UI on the distribution of income is whether workers pay for UI benefits in the form of lower wages. For some workers, unemployment is a predictable event that occurs every year. For these workers, UI may become part of the wage package. If a wage adjustment does occur, then the distribution of income will be largely the same with or without UI benefits, and much of the limited equalizing effect shown earlier will be illusory.

The hypothesis that the availability of UI lowers wages can be tested using wage data from the construction industry. Although UI is very important in the construction industry, its relative importance varies by region and by craft. Weather is a primary cause of seasonal fluctuations in construction employment and inclement weather, particularly freezing temperatures, occurs more often in some parts of the country than in others.

*See Becker [2].

**See Chiswick [4] for an estimate of the effects of the 1974 extension of UI to agriculture. Chiswick found that the introduction of UI resulted in more employees in agriculture in the usual seasons of work and more unemployment in the off-season.

TABLE V

DISTRIBUTION OF COVERED WORKERS, CLAIMANTS AND EXHAUSTEES BY INDUSTRY OF PRINCIPAL EMPLOYMENT, AND INDUSTRY BENEFIT/TAX RATIOS
(Pennsylvania 1967)

Industry	UI Covered Workers %	Claimants %	Exhaustees %	Benefit/Tax Ratios Average for 1957-67
Total - All Industries	100.0	100.0	100.0	88.4
Manufacturing	43.9	63.0	46.8	88.5
Durable Goods	25.5	28.7	28.5	n.a.
Lumber & Furniture	1.1	1.6	2.7	90.1[a/]
Stone, Clay & Glass Prod.	1.9	2.4	1.6	n.a.
Primary Metals	7.0	7.3	3.2	97.9
Fabricated Metal Prod.	2.9	3.5	3.2	n.a.
Nonelectrical Machinery	3.3	2.2	3.2	n.a.
Electrical Machinery	4.4	6.2	8.6	50.1[b/]
Transportation Equipment	2.7	3.4	3.8	72.9
Other Durable Goods	2.2	2.1	2.2	n.a.
Nondurable Goods	18.4	34.3	18.3	n.a.
Food & Kindred Prod.	3.4	3.6	4.3	n.a.
Textile Mill Prod.	2.0	3.6	0.5	130.4
Apparel & Related Prod.	5.2	20.3	5.4	116.0
Paper & Printing	3.2	1.7	4.3	41.9[c/]
Chemicals, Pet. & Coal	2.3	1.3	2.2	55.0[d/]
Other Nondurable Goods	2.3	3.8	1.6	n.a.
Nonmanufacturing	56.1	37.0	53.2	n.a.
Mining	1.0	1.8	2.1	324.2
Contract Construction	5.7	11.8	9.1	159.1
Transp. & Pub. Util.	5.9	3.6	2.7	53.2
Wholesale & Retail Trade	25.9	11.8	19.9	84.0
Fin., Ins. & Real Estate	4.9	1.3	3.8	35.7
Service & Miscellaneous	12.7	6.7	15.6	69.6

n.a. - not available
a/ - Furniture only (SIC 25)
b/ - average for 1960-1967 only
c/ - Printing only (SIC 25)
d/ - Chemicals only (SIC 28)

Source: Pennsylvania Continuous Wage and Benefit History Tapes and Experience Rating in Unemployment Insurance, Joseph Becker (Appendix A).

The seasonality of employment in construction is much less pronounced in the South than in the North. Cold weather does not, however, affect all construction equally: primarily indoor crafts, such as electrical work, are much less seasonal than outdoor crafts, such as carpentry.* Seventy percent of the electricians surveyed in the 1960 U.S. census reported 50 or more weeks of employment while only 40 percent of the carpenters had 50 or more weeks of work.**

Unemployment insurance also differs markedly across the country since each state can set its own UI benefit levels within very broad federal guidelines. The difference in UI levels across states can be attributed to two factors: first, although all states pay benefits approximately equal to one-half of a worker's previous wages up to a maximum amount, the maximum, which applies to the vast majority of union construction workers, differs considerably from state to state; second, some states pay an extra amount for dependents, while others do not.

If workers do pay for UI in the form of lower wages we expect that, holding constant other factors that determine wages, wages would be lower in areas where UI was more generous. We also expect that holding UI and other factors constant, wages would be higher in areas where unemployment is more likely, because workers must be paid higher wages to attract them to jobs that have frequent or long layoffs. These two expected relationships are not really separate; they are both products of the view that workers demand extra remuneration for unpleasant aspects of a job.

It is safe to assume that construction workers are better off when they have more employment opportunities since they can reject offers when they feel overworked. Thus, a career that offers few employment opportunities is undesirable relative to a career that offers frequent opportunities, and pay in the career with few opportunities must compensate for this unattractive feature. This higher pay can take two forms: higher wages during work periods, or unemployment insurance to cover periods when there is no work. Both higher wages and UI lessen the relative unattractiveness of an unstable job. In this sense, higher wages and UI are substitutes; wages should be higher in unstable jobs when UI is low, and if UI levels are held constant, wages should be higher, the fewer days of expected employment.

To determine the effect of job instability on wages, an equation was estimated in which the relative wages of carpenters and electricians were assumed to depend on the

*See "Seasonality and Manpower in Construction" (U.S. Dept. of Labor), 1970. Becker [2] gives benefit/tax ratios for several types of special construction trade contractors in Massachusetts and New York (table A-9). Electrical contractors had benefit/cost ratios in 1967 of 31.8 in Massachusetts and 54.6 in New York. Carpentry contractors, on the other hand, had ratios equal to 141.8 in Massachusetts and 135.5 in New York.
**Occupational Characteristics - Final Report, PC(2) - 7A.

expected loss of employment due to cold weather, the level of UI benefits, and licensing restrictions:

$$\frac{\text{CARPENTERS' WAGES}_i}{\text{ELECTRICIANS' WAGES}_i} = b_0 + b_1 (\text{FREEZING DAYS}_i) + b_2 (\text{REAL UI}_i) + b_3 (\text{LICENSING LAWS})$$

where

WAGES_i	= Union hourly wages for carpenters and electricians in metropolitan area i. (Source: BLS Special Survey in late 1965 and early 1966. Results reported in [8].)
FREEZING DAYS_i	= The average number of days in metropolitan area i when minimum temperature has been 32° or less. (U.S. Dept. of Commerce [20].)
REAL UI_i	= The maximum amount of weekly benefits allowed in metropolitan area i. Assumes two dependents. Dollar value of UI is divided by average wage of electricians and carpenters to adjust for differences in area price levels. (Source: U.S. Dept. of Labor, "Significant *Provisions of State* Unemployment Insurance Laws" [22]. 1966.)
LICENSING LAWS	= 1 if the state licenses journeymen electricians; otherwise 0. (Source: "Summary of Major Provisions of Electrical Code, Licensing and Enforcement Statutes..." [16].)

The estimated equation is based on data from 48 metropolitan areas which cover all geographic areas in the United States.*

Relative wages were used as the dependent variable to abstract from most of the factors that determine geographic wage differences.** Whatever these geographic factors are, they should, for the most part, affect carpenters and electricians equally, since each observation of carpenters' and electricians' wages is from a single metropolitan area. We hypothesize that area to area variation in the remaining three factors, cold weather, UI, and licensing, will cause the ratio of carpenters' to electricians' wages to vary.

Since cold weather limits the employment of carpenters more than electricians, electricians have much more stable employment. Thus, if there are compensating stability differentials, carpenters should receive higher pay, relative to electricians,

*Two multi-state metropolitan areas were excluded because there is no way to determine the level of UI for these areas.

**For example, unionization could cause bias if wages in a single craft were used as the dependent variable because the South is not very unionized and it has little cold weather. Since there are no good measures of the degree of unionization, the cold weather variable could easily pick up the effects of unionization on wages.

in areas that have many cold spells. In the equation, this means that the estimated coefficient b_1 should be positive. If UI acts as a substitute for compensating wage differentials, then carpenters will receive lower relative wages where UI is higher, holding the number of freezing days constant, because UI is more valuable to the more frequently unemployed carpenters. Thus, the estimated b_2 coefficient will be negative. The licensing variable is included to capture the effect of restricted entry into the electrical trades caused by licensing laws. Seven of the metropolitan areas were in states that licensed electricians, but no state licensed carpenters at the time of the wage survey. Thus, the expected sign of b_3 is negative.

The results, shown in table VI, indicate that although licensing doesn't seem to affect relative wages, there are compensating wage differentials for risk of unemployment, and UI acts as a substitute for these differentials.

To the extent that UI and wages are substitute elements in the remuneration package, UI will not alter the distribution of total income. It will, however, increase the inequality of wage income since middle income workers, who are most likely to receive UI, will pay for it in the form of lower wages.

Combined Effects of the Interfirm Subsidy and Wage Displacement

The two preceding sections of this paper have shown that UI creates an interfirm subsidy from stable to unstable firms and that there is evidence that UI displaces wages. We can integrate these two sections if we examine the effects of UI on a stable industry and on an unstable industry. For the sake of convenience, assume that all firms pay the same tax rate, independent of their past unemployment experience.

Figure 1a shows supply and demand curves for labor in a stable industry, both when UI is available and when it is not. Figure 1b shows similar curves for an unstable industry. The subscript UI refers to the case where UI is available.

Without UI, the wage (W) in the unstable industry must be higher than in the stable industry to compensate for the higher probability of unemployment. When UI is introduced, the labor supply curves will shift out. The vertical distance between the supply curves with and without UI is the expected level of benefits per employee.* The shift in supply is greater for the unstable industry because UI is not very valuable to workers who aren't unemployed very often. If each industry pays the same tax rate, the stable industry will pay more than its share of taxes and the unstable will pay less than its share. The demand curves will shift down by the same amount for each industry because the marginal cost of each employee has gone up the same amount. Each demand curve shifts down by the UI tax levied per employee. The net result is that employment goes up in the unstable industry and down in the stable industry.

*For simplicity, we assume that workers are risk-neutral; that is, they do not prefer a certain outcome to an uncertain outcome with the same expected value.

TABLE VI

RELATIVE WAGE EQUATION

Dependent Variable = $\frac{\text{CARPENTERS' WAGE}}{\text{ELECTRICIANS' WAGE}}$

INDEPENDENT VARIABLES		COEFFICIENT	t-STATISTICS
Freezing Days	(b_1)	.0004	1.96
Real UI	(b_2)	-.014	-2.16
Licensing Laws	(b_3)	.012	.50
Constant	(b_0)	1.02	16.29

$R^2 = .13$

$F\ (3/14) = 2.15$

Note that wages go down in both industries, but wages go down more in the unstable industry because of the greater shift in the supply curve. Total expected pay goes up to W^* in the unstable industry because the worker gets W_{UI} in wages and the amount from A to C in expected benefits. The portion of benefits paid by the unstable firm is the smaller amount from A to B. The total pay of workers remaining in the stable firm falls from $\bar{W}$ to W^* with the introduction of UI and stable firms pay more in benefits per employee ($\bar{B}$-$\bar{A}$) than their employees receive in benefits ($\bar{C}$-$\bar{A}$). Thus, some workers may receive increases in total compensation, not because of the UI system but because of the way the UI system is financed. This subsidy element of UI could increase the equality of the income distribution, but many of the workers in notoriously unstable firms -- construction workers and actors for example -- would not have low incomes in the absence of any UI program.

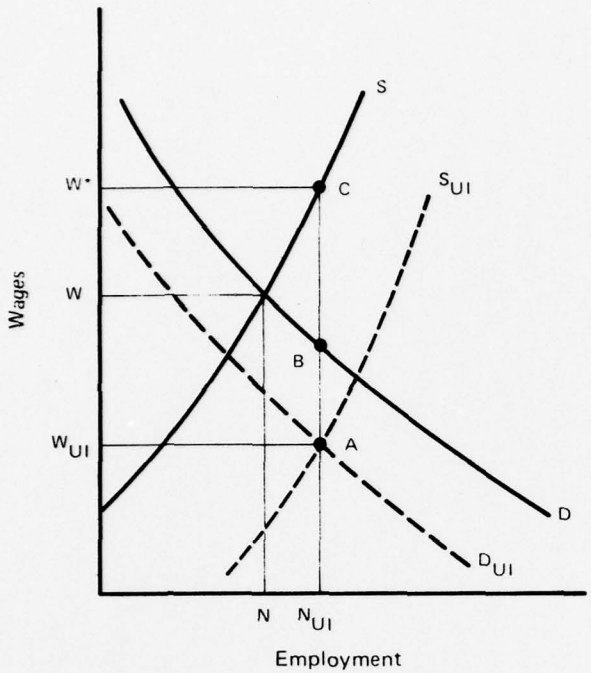


FIG. 1a: UNSTABLE INDUSTRY

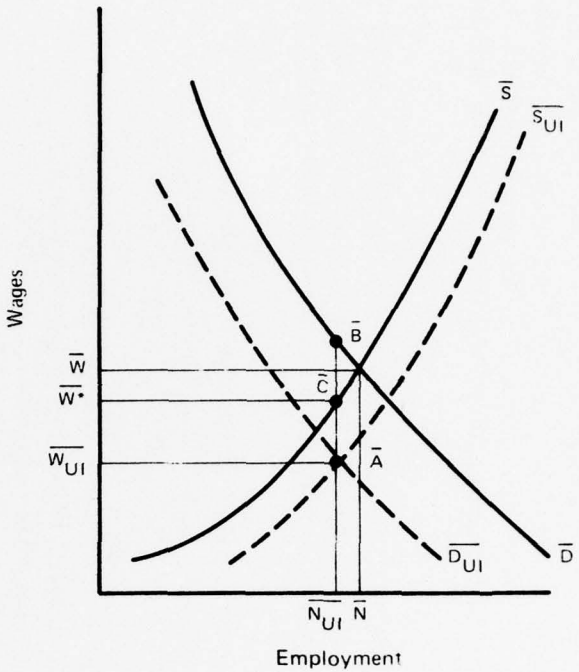


FIG. 1b: STABLE INDUSTRY

FIG. 1: EQUILIBRIUM WAGES AND EMPLOYMENT WITH AND WITHOUT UI

THE EFFECTS OF UI ON BUSINESS CYCLES: UI AS A COUNTER-CYCLICAL TOOL

Many people who have studied UI feel that it produces a number of very troublesome incentives: higher benefits encourage workers to increase the duration of unemployment; the tax-free nature of benefits increases the reliance of employers on layoffs as an adjustment to changes in demand rather than price or inventory adjustments; and, as we have already mentioned, the interfirm subsidy increases employment in firms with more frequent layoffs.*

Despite these effects, UI is often considered an indispensible program because it is believed to have counter-cyclical power. The opening paragraph on unemployment compensation from the 1976 Economic Report of the President summarizes this belief very well:

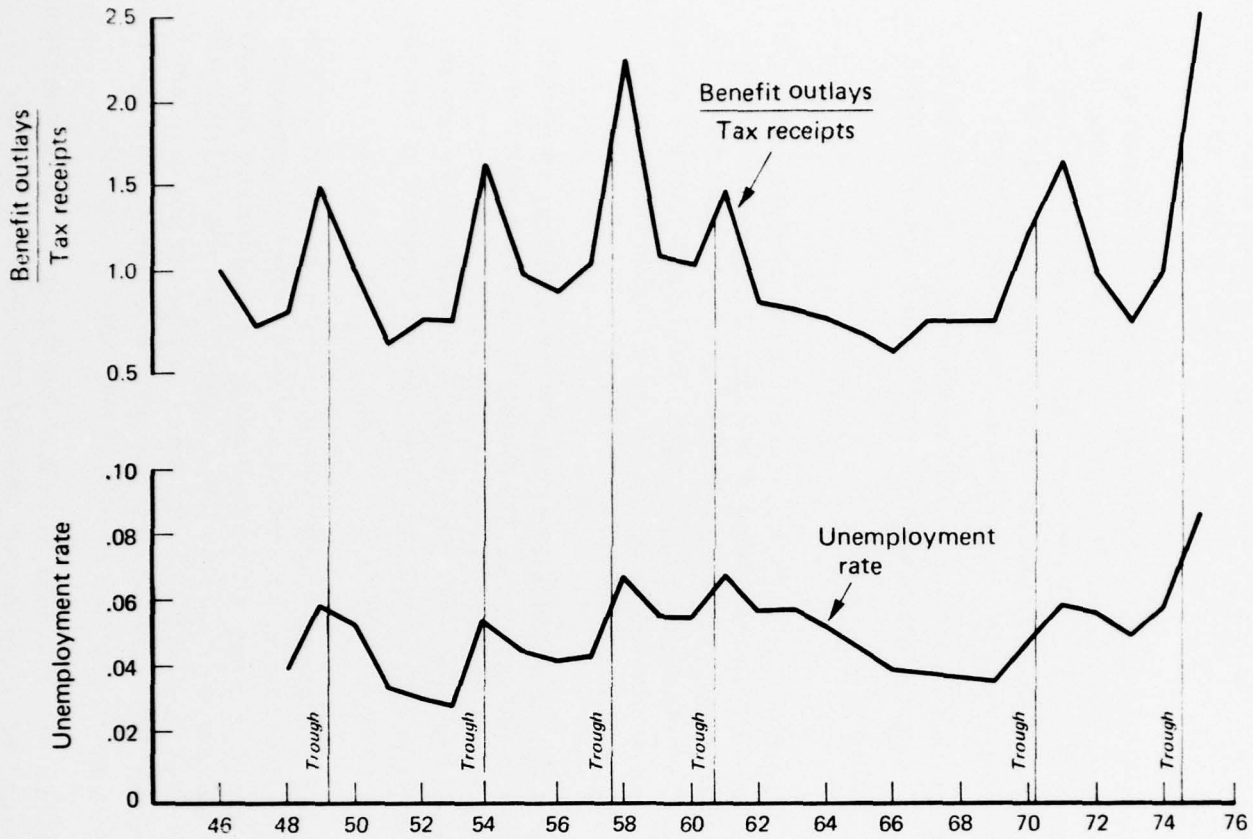
> The recession of 1974-75 has again demonstrated that the unemployment compensation system is one of our most important counter-cyclical tools. As workers are placed on a layoff, benefits begin immediately ....This provision of purchasing power to the unemployed is of substantial importance in promoting economic recovery ....(p. 106).

Figure 2 shows the ratio of benefit payments to taxes since 1947. It also shows the unemployment rate for all workers. Benefit payments do exceed taxes during recessions and taxes exceed benefit payments during booms. In this sense, UI is counter-cyclical. But whether or not it is counter-cyclical in the sense that UI lessens the severity of recessions is an entirely different matter. UI can lessen the severity of recessions only if it increases the spending of recipients. Let E_t be expenditures at time t . Then

$$E_t = UI_t + \text{DISSAVING}_t + \text{OTHER INCOME}_t$$

Expenditures can come from UI, from savings, or from current income. If UI is counter-cyclical, then an increase in UI_t should increase E_t. If, on the other hand, an increase in UI_t simply substitutes for dissaving, expenditures will not increase and UI will not have a counter-cyclical effect.

*There are many studies of the effects of UI on the duration of unemployment. See, for instance, [14]. Martin Feldstein is the best-known exponent of the view that firms alter their layoff behavior because of UI. See [10].



Sources:
Benefit outlays – *Survey of Current Business* (Table 2.1)
Tax receipts – *Survey of Current Business* (Table 3.11)
Sum of employer contributions (state and federal) plus personal contributions
Unemployment Rate – *Economic Report of President,* January 1977 (Table B.29)
Troughs – National Bureau of Economic Research

FIG. 2: UI OUTLAYS AND RECEIPTS OVER THE CYCLE

Joseph Becker [1] in a review of six studies of the adequacy of UI benefits, examined the expenditure patterns of UI recipients in a recessionary period in the late 1950s. Table VII, drawn from his work, summarizes the findings of these six studies. It shows that unemployment does not result in a large drop in expenditures because spending is maintained through dissaving.

More important is that the rate of dissaving during unemployment (column 4) is sensitive to the UI replacement rate (column 1), but total expenditures are not. Since UI is part of income, column 4 could be negatively related to the level of UI (column 1), even though UI had no effect on dissaving, because UI enters the denominator of the dissaving rate. The dissaving rate is $(E_u - I_u)/I_u$ where I is income, E is expenditures and the subscript u refers to the period of unemployment. We multiplied the dissaving rate by I_u/I_{u-1} to get a dissaving measure that was free from obvious bias. The adjusted dissaving measure is $(E_u - I_u)/I_{u-1}$.*

Table VIII presents a more formal statistical test of the relationships between UI and expenditures, and between UI and dissaving. The change in expenditures (column 3 of table VII) and adjusted dissavings were each regressed on the UI replacement rate and a set of dummy variables to control for family type. The relation between expenditure changes and the UI replacement rate is very weak and not statistically distinguishable from zero. In contrast, UI does have an effect on dissaving.**

It is really not surprising that UI affects dissaving because, if there were no UI benefits available, families would save more, specifically to cover expenditures during periods of unemployment. The net effect of UI is to change saving rates over time rather than to change expenditure patterns. This change in private savings patterns offsets the effect of government deficits in a recession; federal collection and disbursement of taxes substitutes for private saving.***

The effect of UI on wages, discussed in the previous section, and effect of UI on savings and expenditures, discussed in this section, are shown diagrammatically in figure 3. Wages are lower when benefits are available because the worker can expect to draw benefits during unemployment. These lower wages do not alter expenditures during periods of employment because the worker saves less for periods of unemployment. Similarly, expenditures are the same during unemployment with and without UI; it is dissaving that is reduced when unemployment insurance is available.

---

*A necessary assumption to make this calculation was that the income from other family members did not change during the period that the beneficiary was unemployed.

**When the dissaving rate is regressed on the UI replacement rate (column 1), the coefficient is -.80, with a t-statistic of (-3.03).

***Similar reasoning leads to the belief that Social Security substitutes for private saving. Darby reviews and extends the literature on this topic in [7].

TABLE VII

ASPECTS OF BENEFICIARY EXPERIENCE SELECTED FROM SIX BENEFIT-ADEQUACY SURVEYS, 1956-1958

Survey site and family status of beneficiaries	(1) Average benefits as a percent of average net wage[a/]	(2) Beneficiary net wage as a percent of net family income	(3) Percent change in expenditures from recent period of employment	(4) Percent that expenditures exceed income
Tampa, Florida ('56)				
Single	46	96	-7	40
Primary	34	91	-5	57
Secondary	27	71	-4	19
Anderson, S.C. ('57)				
Single	56	92	-16	29
Primary	45	77	-10	30
Secondary	53	39	-4	13
Albany, N.Y. ('57)				
Single	54	90	+6	42
Primary	45	80	-10	45
Secondary	62	36	+10	23
Portland, Ore. ('58)				
Single	58	91	-15	28
Primary (1 earner)	45	88	-25	39
Primary (2 earners)	48	67	-18	33
Secondary	58	34	-9	16
St. Louis, Mo. ('58)				
Single	48	94	-17	42
Primary (1 earner)	38	83	-20	43
Primary (2 earners)	42	65	-19	18
Secondary	50	38	-9	12
Utica, N.Y. ('58)				
Single	63	89	-15	10
Primary (1 earner)	57	82	-9	16
Primary (2 earners)	57	59	-4	10
Secondary	65	34	-7	2

a/ - net means gross minus Social Security and income taxes

Source: In Aid of the Unemployed, Edited by Joseph M. Becker (Table 5-2)

TABLE VIII

EXPENDITURE AND DISSAVING EQUATIONS
(t-statistics in parentheses)

Dependent Variables =	ΔExpenditures	Adjusted Dissavings
Independent Variable		
UI Replacement Rate	.09 (.45)	-.23 (-1.94)
Family Type		
Single	1.90 (.42)	2.33 (.69)
Secondary Worker	8.8 (2.02)	-4.72 (-2.01)
Constant	-17.43 (-1.85)	27.37 (3.87)
R^2	.10	.30
F(3/17)	1.81	2.62

Thus, it appears that the counter-cyclical potential of UI may be illusory. Claims that the system is counter-cyclical have focused on benefit payments and taxes over the cycle and have assumed, or calculated with a Keynesian-multiplier model, that benefits increase national income if they increase the government deficit in a recession.* As we have seen, this need not be the case when actual periods of unemployment are not much longer than anticipated unemployment. In very deep recessions, when unemployment is much greater than expected, savings may not be great enough to finance desired expenditures. It is during these periods that UI may play an important, but as yet undocumented, role in stabilizing the economy.

Our simple test of the counter-cyclical power of UI is based on only a small amount of data and the results must be interpreted as preliminary. They do agree, however, with two earlier studies that have used a very different approach to measure the counter-cyclical impact of UI.

In his Ph.D. dissertation William Owen [17] tried to determine whether a state experiences a less severe decline in employment during a national downturn if it has generous unemployment benefits. He tested the counter-cyclical effectiveness of UI by regressing the 1954 and 1958 cyclical increases in each state's covered unemployment on a measure of the degree to which UI replaces lost wages in each state. Owen

*For a review of these studies, see Hamermesh [13].

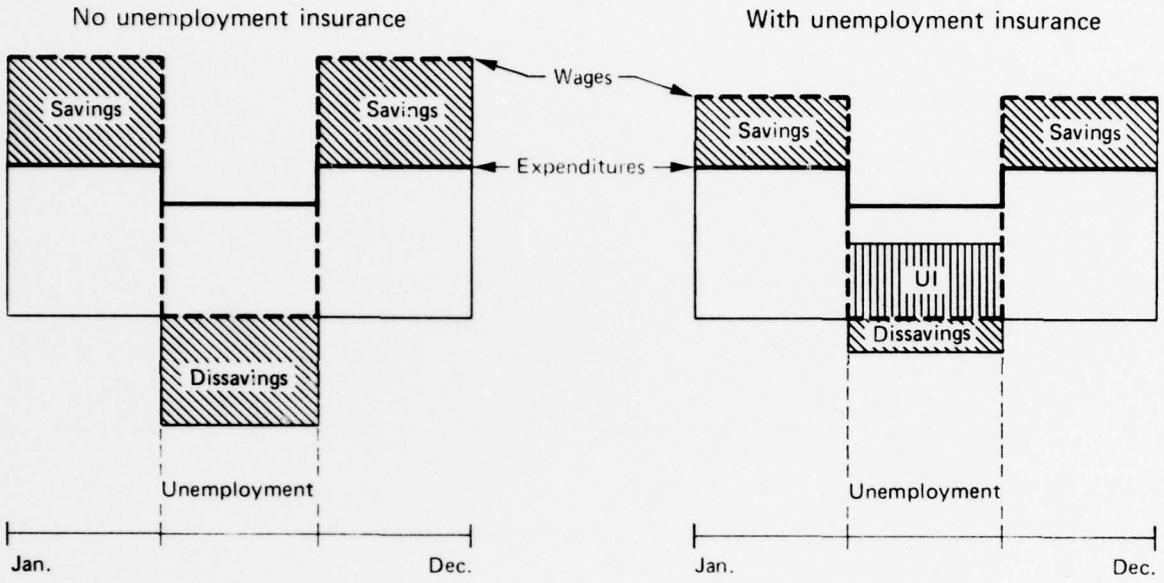


FIG. 3: WAGES, SAVINGS, AND EXPENDITURES WITH AND WITHOUT UI

found that states with higher benefits did not experience less severe recessions than those with low benefits. In fact, there seemed to be a positive relation between benefit levels and cyclical declines in a state.

In a later dissertation, Jerome Komisar [15] used a similar test to examine counter-cyclical effects in three recessions: 1954, 1958, and 1960-61. Again, the relationships between benefits and cyclical sensitivity seemed, if anything, to be positive.

The results of both these studies have been questioned because UI could be endogenous, that is, it may be states with a high degree of cyclical sensitivity legislate higher levels of UI. Until this "reverse casuality" argument is tackled and treated empirically, the results of studies like Komisar's and Owen's can be treated as only tentative evidence against the counter-cyclical power of UI.

CONCLUSION

Unemployment insurance could affect the distribution of income in two ways: by providing direct payments to the unemployed and by lessening the severity of recessions. At best, it appears that UI has only a modest potential for increasing the equality of income. The small equalizing effect of benefit payments to the unemployed is offset by lower wages for workers who are most likely to receive UI, and the counter-cyclical potential of UI is offset by adjustments in savings patterns.

Although at first glance it would seem that UI tends to equalize incomes in the short run, long run adjustments in wages and savings patterns offset its apparent effects on income and expenditures. This does not mean, however, that we can decrease UI without fear of adverse effects on the distribution of income or the level of national income. Many workers now expect to receive UI benefits when they are unemployed and they have decreased their savings accordingly. If UI payments were suddenly cut, those who expected UI payment might not have enough savings to finance desired expenditures and, therefore, an unexpected decrease in UI could cause a sharp reduction in expenditures and the kind of snowballing unemployment that occurs in Keynesian-multiplier models. Thus, even though market adjustments mitigate the distributional effects of UI, since these adjustments take time, a sudden decrease in UI could make matters worse than if there had neven been any UI.

We have found evidence that when workers expect UI payments, UI does not have an equalizing effect on income. Since UI was set up to be an enduring program, not subject to legislative whims, it is by nature a program that will produce the changes in expectations that mitigate the potential of UI to equalize income. The main purpose of UI is not, however, to equalize the distribution of income, but to provide payments, as a matter of right, not as a matter of need, to covered workers who are unemployed through no fault of their own. To the extent that UI accomplishes this main objective, it may be a desirable program even if it has no effect on the distribution of income.

REFERENCES

[1] Becker, Joseph, (ed), In Aid of the Unemployed, Johns Hopkins University Press, 1965

[2] Becker, Joseph M., Experience Rating in Unemployment Insurance, Johns Hopkins University Press, 1972

[3] Bureau of Census, U.S. Census of Population: 1960, Subject Reports, Occupational Characteristics. Final Report PC(2)-7A

[4] Chiswick, Barry, "The Effect of Unemployment Insurance on a Seasonal Industry: Agriculture," Journal of Political Economy, June 1976

[5] Classen, Kathleen, "The Current Population Survey and Unemployment Insurance Research," The Public Research Institute, Jan 1976

[6] Congressional Budget Office, "Unemployment Compensation: A Background Report," Background Paper No. 15, Dec 1976

[7] Darby, Michael, "The Effects of Social Security on Income and the Capital Stock," University of California (Los Angeles), Discussion Paper No. 95, July 1977

[8] David, Lily M. and T.P. Kanninen, "Workers' Wages in Construction and Maintenance," Monthly Labor Review, Jan 1968

[9] Feldstein, Martin, "Unemployment Compensation: Adverse Incentives and Distributional Anomolies," National Tax Journal, Jun 1974

[10] Feldstein, Martin, "Temporary Layoffs in the Theory of Unemployment," Journal of Political Economy, Oct 1976

[11] Feldstein, Martin, "New Evidence on the Distribution of Unemployment Insurance Benefits," Harvard, Discussion Paper No. 536, Feb 1977

[12] Gramlich, Edward M., "The Distributional Effects of Higher Unemployment," Brookings Papers on Economic Activity, 1974:2

[13] Hamermesh, Daniel, Jobless Pay and the Economy, Johns Hopkins University Press, 1977

[14] Katz, Arnold (ed.), The Economics of Unemployment Insurance: A Symposium, Industrial and Labor Relations Review, Jul 1977

[15] Komisar, Jerome, Unemployment Compensation and the Duration and Rate of Unemployment (Unpublished dissertation), Columbia University, 1968

[16] National Electrical Contractors Assn., Inc., "Summary of Major Provisions of Electrical Code, Licensing and Enforcement Statutes of the 50 States and the District of Columbia," 1967

[17] Owen, William, The Countercyclical Effectiveness of Unemployment Insurance, Purdue University, 1965

[18] Palmer, John, Inflation, Unemployment and Poverty, D.C. Heath and Company, 1973

[19] U.S. Council of Economic Advisers, Economic Report of the President, U.S. Government Printing Office

[20] U.S. Department of Commerce, "Local Climatological Data, Annual Summary with Comparative Data," Environmental Services Administration

[21] U.S. Department of Labor, "Work Experience of the Population," Special Labor Force Reports, Bureau of Labor Statistics

[22] U.S. Department of Labor, "Significant Provisions of State Unemployment Insurance Laws," Employment and Training Administration

[23] U.S. Department of Labor, "Unemployment Insurance Statistics," Employment and Training Administration

[24] U.S. Department of Labor, Seasonality and Manpower in Construction, Bulletin 1642, U.S. Government Printing Office, 1970

CNA Professional Papers – 1973 to Present*

PP 103
Friedheim, Robert L., "Political Aspects of Ocean Ecology" 48 pp., Feb 1973, published in Who Protects the Oceans, John Lawrence Hargrove (ed.) (St. Paul: West Publ'g. Co., 1974), published by the American Society of International Law) AD 757 936

PP 104
Schick, Jack M., "A Review of James Cable, Gunboat Diplomacy Political Applications of Limited Naval Forces," 5 pp., Feb 1973, (Reviewed in the American Political Science Review, Vol. LXVI, Dec 1972)

PP 105
Corn, Robert J. and Phillips, Gary R., "On Optimal Correction of Gunfire Errors," 22 pp., Mar 1973, AD 761 674

PP 106
Stoloff, Peter H., "*User's Guide for Generalized* Factor Analysis Program (FACTAN)," 35 pp., Feb 1973, (Includes an addendum published Aug 1974) AD 758 824

PP 107
Stoloff, Peter H., "*Relating Factor Analytically* Derived Measures to Exogenous Variables," 17 pp., Mar 1973, AD 758 820

PP 108
McConnell, James M. and Kelly, Anne M., "*Superpower Naval Diplomacy in the Indo-Pakistani Crisis*," 14 pp., 5 Feb 1973, (Published, with revisions, in Survival, Nov/Dec 1973) AD 761 675

PP 109
Berghoefer, Fred G., "Salaries: A Framework for the Study of Trend," 8 pp., Dec 1973, (Published in Review of Income and Wealth, Series 18, No. 4, Dec 1972)

PP 110
Augusta, Joseph, "A Critique of Cost Analysis," 9 pp., Jul 1973, AD 766 376

PP 111
Herrick, Robert W., "The USSR's 'Blue Belt of Defense' Concept: A Unified Military Plan for Defense Against Seaborne Nuclear Attack by Strike Carriers and Polaris/Poseidon SSBNs," 18 pp., May 1973, AD 766 375

PP 112
Ginsberg, Lawrence H., "ELF Atmosphere Noise Level Statistics for Project SANGUINE," 29 pp., Apr 1974, AD 786 969

PP 113
Ginsberg, Lawrence H., "Propagation Anomalies During Project SANGUINE Experiments," 5 pp., Apr 1974, AD 786 968

PP 114
Maloney, Arthur P., "Job Satisfaction and Job Turnover," 41 pp., Jul 1973, AD 768 410

PP 115
Silverman, Lester P., "The Determinants of Emergency and Elective Admissions to Hospitals," 145 pp., 18 Jul 1973, AD 766 377

PP 116
Rehm, Allan S., "*An Assessment of Military Operations* Research in the USSR," 19 pp., Sep 1973, (Reprinted from Proceedings, 30th Military Operations Research Symposium (U), Secret Dec 1972) AD 770 116

PP 117
McWhite, Peter B. and Ratliff, H. Donald,* "Defending a Logistics System Under Mining Attack,"** 24 pp., Aug 1976 (to be submitted for publication in Naval Research Logistics Quarterly), presented at 44th National Meeting, Operations Research Society of America, November 1973, AD A030 454
**University of Florida.*
***Research supported in part under Office of Naval Research Contract N00014-68-0273-0017*

PP 118
Barfoot, C. Bernard, "Markov Duels," 18 pp., Apr 1973, (Reprinted from Operations Research, Vol. 22, No. 2, Mar-Apr 1974)

PP 119
Stoloff, Peter and Lockman, Robert F., "Development of Navy Human Relations Questionnaire," 2 pp., May 1974, (Published in American Psychological Association Proceedings, 81st Annual Convention, 1973) AD 779 240

PP 120
Smith, Michael W. and Schrimper, Ronald A.,* "Economic Analysis of the Intracity Dispersion of Criminal Activity," 30 pp., Jun 1974, (Presented at the Econometric Society Meetings, 30 Dec 1973) AD 780 538
**Economics, North Carolina State University.*

PP 121
Devine, Eugene J., "Procurement and Retention of Navy Physicians," 21 pp., Jun 1974, (Presented at the 49th Annual Conference, Western Economic Association, Las Vegas, Nev., 10 Jun 1974) AD 780 539

PP 122
Kelly, Anne M., "The Soviet Naval Presence During the Iraq-Kuwaiti Border Dispute: March-April 1973," 34 pp., Jun 1974, (Published in Soviet Naval Policy, ed. Michael MccGwire; New York: Praeger) AD 780 592

PP 123
Petersen, Charles C., "The Soviet Port-Clearing Operation in Bangladash, March 1972-December 1973," 35 pp., Jun 1974, (Published in Michael MccGwire, et al. (eds) Soviet Naval Policy: Objectives and Constraints, (New York: Praeger Publishers, 1974) AD 780 540

PP 124
Friedheim, Robert L. and Jehn, Mary E., "Anticipating Soviet Behavior at the Third U.N. Law of the Sea Conference: USSR Positions and Dilemmas," 37 pp., 10 Apr 1974, (Published in Soviet Naval Policy, ed. Michael MccGwire; New York: Praeger) AD 783 701

PP 125
Weinland, Robert G., "Soviet Naval Operations–Ten Years of Change," 17 pp., Aug 1974, (Published in Soviet Naval Policy, ed. Michael MccGwire; New York: Praeger) AD 783 962

PP 126 – Classified.

PP 127
Dragnich, George S., "The Soviet Union's Quest for Access to Naval Facilities in Egypt Prior to the June War of 1967," 64 pp., Jul 1974, AD 786 318

PP 128
Stoloff, Peter and Lockman, Robert F., "Evaluation of Naval Officer Performance," 11 pp., (Presented at the 82nd Annual Convention of the American Psychological Association, 1974) Aug 1974, AD 784 012

PP 129
Holen, Arlene and Horowitz, Stanley, "Partial Unemployment Insurance Benefits and the Extent of Partial Unemployment," 4 pp., Aug 1974, (Published in the Journal of Human Resources, Vol. IX, No. 3, Summer 1974) AD 784 010

PP 130
Dismukes, Bradford, "Roles and Missions of Soviet Naval General Purpose Forces in Wartime: Pre-SSBN Operation," 20 pp., Aug 1974, AD 786 320

PP 131
Weinland, Robert G., "Analysis of Gorshkov's *Navies in War and Peace*," 45 pp., Aug 1974, (Published in Soviet Naval Policy, ed. Michael MccGwire: New York: Praeger) AD 786 319

PP 132
Kleinman, Samuel D., "Racial Differences in Hours Worked in the Market: A Preliminary Report," 77 pp., Feb 1975, (Paper read on 26 Oct 1974 at Eastern Economic Association Convention in Albany, N.Y.) AD A 005 517

PP 133
Squires, Michael L., "A Stochastic Model of Regime Change in Latin America," 42 pp., Feb 1975, AD A 007 912

PP 134
Root, R. M. and Cunniff, P. F.,* "A Study of the Shock Spectrum of a Two-Degree-of-Freedom Nonlinear Vibratory System," 39 pp., Dec 1975, (Published in the condensed version of The Journal of the Acoustic Society, Vol 60, No. 6, Dec 1976, pp. 1314
**Department of Mechanical Engineering, University of Maryland.*

PP 135
Goudreau, Kenneth A.; Kuzmack, Richard A.; Wiedemann, Karen, "Analysis of Closure Alternatives for Naval Stations and Naval Air Stations," 47 pp., 3 Jun 1975 (Reprinted from "Hearing before the Subcommittee on Military Construction of the Committee on Armed Service," U.S. Senate, 93rd Congress, 1st Session, Part 2, 22 Jun 1973)

PP 136
Stallings, William, "Cybernetics and Behavior Therapy," 13 pp., Jun 1975

PP 137
Petersen, Charles C., "The Soviet Union and the Reopening of the Suez Canal: Mineclearing Operations in the Gulf of Suez," 30 pp., Aug 1975, AD A 015 376

*CNA Professional Papers with an AD number may be obtained from the National Technical Information Service, U.S. Department of Commerce, Springfield, Virginia 22151. Other papers are available from the author at the Center for Naval Analyses, 1401 Wilson Boulevard, Arlington, Virginia 22209.

CNA Professional Papers — 1973 to Present (Continued)

PP 138
Stallings, William, "BRIDGE: An Interactive Dialogue-Generation Facility," 5 pp., Aug 1975 (Reprinted from IEEE Transactions on Systems, Man, and Cybernetics, Vol. 5, No. 3, May 1975)

PP 139
Morgan, William F., Jr., "Beyond Folklore and Fables in Forestry to Positive Economics," 14 pp., (Presented at Southern Economic Association Meetings November, 1974) Aug 1975, AD A 015 293

PP 140
Mahoney, Robert and Druckman, Daniel*, "Simulation, Experimentation, and Context," 36 pp., 1 Sep 1975, (Published in Simulation & Games, Vol. 6, No. 3, Sep 1975)
*Mathematica, Inc.

PP 141
Mizrahi, Maurice M., "Generalized Hermite Polynomials,"* 5 pp., Feb 1976 (Reprinted from the Journal of Computational and Applied Mathematics, Vol. 1, No. 4 (1975), 273-277).
*Research supported by the National Science Foundation

PP 142
Lockman, Robert F., Jehn, Christopher, and Shughart, William F. II, "Models for Estimating Premature Losses and Recruiting District Performance," 36 pp., Dec 1975 (Presented at the RAND Conference on Defense Manpower, Feb 1976; to be published in the conference proceedings) AD A 020 443

PP 143
Horowitz, Stanley and Sherman, Allan (LCdr., USN), "Maintenance Personnel Effectiveness in the Navy," 33 pp., Jan 1976 (Presented at the RAND Conference on Defense Manpower, Feb 1976; to be published in the conference proceedings) AD A021 581

PP 144
Dutch, William J., "The Navy of the Republic of China: History, Problems, and Prospects," 66 pp., Aug 1976 (To be published in "A Guide to Asiatic Fleets," ed. by Barry M. Blechman, Naval Institute Press) AD A030 460

PP 145
Kelly, Anne M., "Port Visits and the "Internationalist Mission" of the Soviet Navy," 36 pp., Apr 1976 AD A023 436

PP 146
Palmour, Vernon E., "Alternatives for Increasing Access to Scientific Journals," 6 pp., Apr 1975 (Presented at the 1975 IEEE Conference on Scientific Journals, Cherry Hill, N.C., Apr 28-30; published in IEEE Transactions on Professional Communication, Vol. PC-18, No. 3, Sep 1975) AD A021 798

PP 147
Kessler, J. Christian, "Legal Issues in Protecting Offshore Structures," 33 pp., Jun 1976 (Prepared under task order N00014-68-A-0091-0023 for ONR) AD A028 389

PP 148
McConnell, James M., "Military-Political Tasks of the Soviet Navy in War and Peace," 62 pp., Dec 1975 (Published in Soviet Oceans Development Study of Senate Commerce Committee October 1976) AD A022 590

PP 149
Squires, Michael L., "Counterforce Effectiveness: A Comparison of the Tsipis "K" Measure and a Computer Simulation," 24 pp., Mar 1976 (Presented at the International Study Association Meetings, 27 Feb 1976) AD A022 591

PP 150
Kelly, Anne M. and Petersen, Charles, "Recent Changes in Soviet Naval Policy: Prospects for Arms Limitations in the Mediterranean and Indian Ocean," 28 pp., Apr 1976, AD A 023 723

PP 151
Horowitz, Stanley A., "The Economic Consequences of Political Philosophy," 8 pp., Apr 1976 (Reprinted from Economic Inquiry, Vol. XIV, No. 1, Mar 1976)

PP 152
Mizrahi, Maurice M., "On Path Integral Solutions of the Schrodinger Equation, Without Limiting Procedure,"* 10 pp., Apr 1976 (Reprinted from Journal of Mathematical Physics, Vol. 17, No. 4 (Apr 1976), 566-575).
*Research supported by the National Science Foundation

PP 153
Mizrahi, Maurice M., "WKB Expansions by Path Integrals, With Applications to the Anharmonic Oscillator,"* 137 pp., May 1976 (Submitted for publication in Annals of Physics). AD A025 440
*Research supported by the National Science Foundation

PP 154
Mizrahi, Maurice M., "On the Semi-Classical Expansion in Quantum Mechanics for Arbitrary Hamiltonians," 19 pp., May 1976 (To appear in the Journal of Mathematical Physics) AD A025 441

PP 155
Squires, Michael L., "Soviet Foreign Policy and Third World Nations," 26 pp., Jun 1976 (Prepared for presentation at the Midwest Political Science Association meetings, Apr 30, 1976) AD A028 388

PP 156
Stallings, William, "Approaches to Chinese Character Recognition," 12 pp., Jun 1976 (Reprinted from Pattern Recognition (Pergamon Press), Vol. 8, pp. 87-98, 1976) AD A028 692

PP 157
Morgan, William F., "Unemployment and the Pentagon Budget: Is There Anything in the Empty Pork Barrel?" 20 pp., Aug 1976 AD A030 455

PP 158
Haskell, LCdr. Richard D. (USN), "Experimental Validation of Probability Predictions," 25 pp., Aug 1976 (Presented at the Military Operations Research Society Meeting, Fall 1976) AD A030 458

PP 159
McConnell, James M., "The Gorshkov Articles, The New Gorshkov Book and Their Relation to Policy," 93 pp., Jul 1976 (To be printed in *Soviet Naval Influence: Domestic and Foreign Dimensions*, ed. by M. MccGwire and J. McDonnell; New York: Praeger) AD A029 227

PP 160
Wilson, Desmond P., Jr., "The U.S. Sixth Fleet and the Conventional Defense of Europe," 50 pp., Sep 1976 (Submitted for publication in Adelphi Papers, I.I.S.S., London) AD A030 457

PP 161
Melich, Michael E. and Peet, Vice Adm. Ray (USN, Retired), "Fleet Commanders: Afloat or Ashore?" 9 pp., Aug 1976 (Reprinted from *U.S. Naval Institute Proceedings*, Jun 1976) AD A030 456

PP 162
Friedheim, Robert L., "Parliamentary Diplomacy," 106 pp. Sep 1976 AD A033 306

PP 163
Lockman, Robert F., "A Model for Predicting Recruit Losses," 9 pp., Sep 1976 (Presented at the 84th annual convention of the American Psychological Association, Washington, D.C., 4 Sep 1976) AD A030 459

PP 164
Mahoney, Robert B., Jr., "An Assessment of Public and Elite Perceptions in France, The United Kingdom, and the Federal Republic of Germany, 31 pp., Feb 1977 (Presented at Conference "Perception of the U.S. Soviet Balance and the Political Uses of Military Power" sponsored by Director, Advanced Research Projects Agency, April 1976) AD 036 599

PP 165
Jondrow, James M. "Effects of Trade Restrictions on Imports of Steel," 67 pp., November 1976, (Delivered at ILAB Conference in Dec 1976)

PP 166
Feldman, Paul, "Impediments to the Implementation of Desirable Changes in the Regulation of Urban Public Transportation," 12 pp., Oct 1976, AD A033 322

PP 166 Revised
Feldman, Paul, "Why It's Difficult to Change Regulation," Oct 1976

PP 167
Kleinman, Samuel, "ROTC Service Commitments: a Comment," 4 pp., Nov 1976, (To be published in Public Choice, Vol. XXIV, Fall 1976) AD A033 305

PP 168
Lockman, Robert F., "Revalidation of CNA Support Personnel Selection Measures," 36 pp., Nov 1976

PP 169
Jacobson, Louis S., "Earnings Losses of Workers Displaced from Manufacturing Industries," 38 pp., Nov 1976, (Delivered at ILAB Conference in Dec 1976)

PP 170
Brechling, Frank P., "A Time Series Analysis of Labor Turnover," Nov 1976, (Delivered at ILAB Conference in Dec 1976)

PP 171
Ralston, James M., "A Diffusion Model for GaP Red LED Degradation," 10 pp., Nov 1976, (Published in Journal of Applied Pysics, Vol. 47, pp. 4518-4527, Oct 1976)

PP 172
Classen, Kathleen P., "Unemployment Insurance and the Length of Unemployment," Dec 1976, (Presented at the University of Rochester Labor Workshop on 16 Nov 1976)

PP 173
Kleinman, Samuel D., "A Note on Racial Differences in the Added-Worker/Discouraged-Worker Controversy," 2 pp., Dec 1976, (Published in the American Economist, Vol. XX, No. 1, Spring 1976)

CNA Professional Papers – 1973 to Present (Continued)

PP 174
Mahoney, Robert B., Jr., "A Comparison of the Brookings and International Incidents Projects," 12 pp. Feb 1977 AD 037 206

PP 175
Levine, Daniel, Stoloff, Peter and Spruill, Nancy, "Public Drug Treatment and Addict Crime," June 1976. (Published in Journal of Legal Studies, Vol. 5, No. 2)

PP 176
Felix, Wendi, "Correlates of Retention and Promotion for USNA Graduates," 38 pp., Mar 1977

PP 177
Lockman, Robert F. and Warner, John T., "Predicting Attrition: A Test of Alternative Approaches," 33 pp. Mar 1977. (Presented at the *OSD/ONR Conference on Enlisted Attrition* Xerox International Training Center, Leesburg, Virginia, 4-7 April 1977)

PP 178
Kleinman, Samuel D., "An Evaluation of Navy Unrestricted Line Officer Accession Programs," 23 pp. April 1977. (To be presented at the NATO Conference on Manpower Planning and Organization Design, Stresa, Italy, 20 June 1977)

PP 179
Stoloff, Peter H. and Balut, Stephen J., "Vacate: A Model for Personnel Inventory Planning Under Changing Management Policy," 14 pp. April 1977. (To be presented at the NATO Conference on Manpower Planning and Organization Design, Stresa, Italy, 20 June 1977)

PP 180
Horowitz, Stanley A. and Sherman, Allan, "The Characteristics of Naval Personnel and Personnel Performance," 16 pp. April 1977. (To be presented at the NATO Conference on Manpower Planning and Organization Design, Stresa, Italy, 20 June 1977)

PP 181
Balut, Stephen J. and Stoloff, Peter, "An Inventory Planning Model for Navy Enlisted Personnel," 35 pp., May 1977. (Prepared for presentation at the Joint National Meeting of the Operations Research Society of America and The Institute for Management Science, 9 May 1977, San Francisco, California)

PP 182
Murray, Russell, 2nd, "The Quest for the Perfect Study or My First 1138 Days at CNA," 57 pp., April 1977

PP 183
Kassing, David, "Changes in Soviet Naval Forces," 33 pp., November, 1976. (To be published as a chapter in a book published by The National Strategic Information Center)

PP 184
Lockman, Robert F., "An Overview of the OSD/ONR Conference on First Term Enlisted Attrition," 22 pp., June 1977. (Presented to the 39th MORS Working Group on Manpower and Personnel Planning, Annapolis, Md., 28-30 June 1977)

PP 185
Kassing, David, "New Technology and Naval Forces *in the South Atlantic*," 22 pp. (This paper was the basis for a presentation made at the Institute for Foreign Policy Analyses, Cambridge, Mass., 28 April 1977.)

PP 186
Mizrahi, Maurice M., "Phase Space Integrals, Without Limiting Procedure," 31 pp., May 1977. (Submitted for publication in Journal of Mathematical Physics)

PP 187
Coile, Russell C., "Nomography for Operations Research," 35 pp., April 1977. (Presented at the Joint National Meeting of the Operations Research Society of America and The Institute for Management Services, San Francisco, California, 9 May 1977)

PP 188
Durch, William J., "Information Processing and Outcome Forecasting for Multilateral Negotiations: Testing One Approach," 53 pp., May 1977 (Prepared for presentation to the *18th Annual Convention* of the International Studies Association, Chase-Park Plaza Hotel, St. Louis, Missouri, March 16-20, 1977)

PP 189
Coile, Russell C., "Error Detection in Computerized Information Retrieval Data Bases," July, 1977, 13 pp. Presented at the Sixth Cranfield International Conference on Mechanized Information Storage and Retrieval Systems, Cranfield Institute of Technology, Cranfield, Bedford, England, 26-29 July 1977

PP 190
Mahoney, Robert B., Jr., "European Perceptions and East-West Competition," 96 pp., July 1977 (Prepared for presentation at the annual meeting of the International Studies Association, St. Louis, Mo., March, 1977)

PP 191
Sawyer, Ronald, "The Independent Field Assignment: One Man's View," August 1977, 25 pp.

PP 192
Holen, Arlene, "Effects of Unemployment Insurance Entitlement on Duration and Job Search Outcome," August 1977, 6 pp., (Reprinted from Industrial and Labor Relations Review, Vol. 30, No. 4, Jul 1977)

PP 193
Horowitz, Stanley A., "A Model of Unemployment Insurance and the Work Test," August 1977, 7 pp. (Reprinted from Industrial and Labor Relations Review, Vol. 30, No. 40, Jul 1977)

PP 194
Classen, Kathleen P., "The Effects of Unemployment Insurance on the Duration of Unemployment and Subsequent Earnings," August 1977, 7 pp. (Reprinted from Industrial and Labor Relations Review, Vol. 30, No. 40, Jul 1977)

PP 195
Brechling, Frank, "Unemployment Insurance Taxes and Labor Turnover: Summary of Theoretical Findings," 12 pp. (Reprinted from Industrial and Labor Relations Review, Vol. 30, No. 40, Jul 1977)

PP 196
Ralston, J. M. and Lorimor, O. G., "Degradation of Bulk Electroluminescent Efficiency in Zn, O-Doped GaP LED's," July 1977, 3 pp. (Reprinted from IEEE Transactions on Electron Devices, Vol. ED-24, No. 7, July 1977)

PP 197
Wells, Anthony R., "The Centre for Naval Analyses," 14 pp., Dec 1977

PP 198
Classen, Kathleen P., "The Distributional Effects of Unemployment Insurance," 25 pp., Sept. 1977 (Presented at a Hoover Institution Conference on Income Distribution, Oct 7-8, 1977)

PP 199
Durch, William J., "Revolution From A F.A.R. – The Cuban Armed Forces in Africa and the Middle East," Sep 1977, 16 pp.

PP 200
Powers, Bruce F., "The United States Navy," 40 pp. Dec 1977. (To be published in American Military Machine)

PP 201
Durch, William J., "The Cuban Military in Africa and The Middle East: From Algeria to Angola," Sep 1977, 67 pp.

PP 202
Feldman, Paul, "Why Regulation Doesn't Work," (Reprinted from *Technological Change* and *Welfare in the Regulated Industries and Review of Social Economy*, Vol. XXIX, March, 1971, No. 1.) Sep 1977, 8 pp.

PP 203
Feldman, Paul, "Efficiency, Distribution, and the Role of Government in a Market Economy," (Reprinted from *The Journal of Political Economy*, Vol. 79, No. 3, May/June 1971.) Sep 1977, 19 pp.

PP 204
Wells, Anthony R., "The 1967 June War: Soviet Naval Diplomacy and The Sixth Fleet – A Reappraisal," Oct 1977, 36 pp.

PP 205
Coile, Russell C., "A Bibliometric Examination of the Square Root Theory of Scientific Publication Productivity," (Presented at the annual meeting of the American Society for Information Science, Chicago, Illinois, 29 September 1977.) Oct 1977, 6 pp.

PP 206
McConnell, James M., "Strategy and Missions of the Soviet Navy in the Year 2000," 48 pp., Nov 1977. (To be presented at a Conference on Problems of Sea Power as we Approach the 21st Century, sponsored by the American Enterprise Institute for Public Policy Research, 6 October 1977, and subsequently published in a collection of papers by the Institute)

CNA Professional Papers – 1973 to Present (Continued)

PP 207
Goldberg, Lawrence, "Cost-Effectiveness of Potential Federal Policies Affecting Research & Development Expenditures in the Auto, Steel and Food Industries," 36 pp., Oct 1977, (Presented at Southern Economic Association Meetings beginning 2 November 1977)

PP 208
Roberts, Stephen S., "The Decline of the Overseas Station Fleets: The United States Asiatic Fleet and the Shanghai Crisis, 1932," 18 pp., Nov 1977, (Reprinted from The American Neptune, Vol. XXXVII., No. 3, July 1977)

PP 209 Classified.

PP 210
Kassing, David, "Protecting The Fleet," 40 pp., Dec 1977 (Prepared for the American Enterprise Institute Conference on Problems of Sea Power as We Approach the 21st Century, October 6-7, 1977)

PP 211
Mizrahi, Maurice M., "On Approximating the Circular Coverage Function," 14 pp., Feb 1978

PP 213
Mangel, Marc, "Fluctuations in Systems with Multiple Steady States. Application to Lanchester Equations," 12 pp., Feb 78, (Presented at the First Annual Workshop on the Information Linkage Between Applied Mathematics and Industry, Naval PG School, Feb 23-25, 1978)

PP 215
Coile, Russell C., "Comments on: *Principles of Information Retrieval* by Manfred Kochen," 10 pp., Mar 78, (Published as a Letter to the Editor, Journal of Documentation, Vol. 31, No. 4, pages 298-301, December 1975)

PP 216
Coile, Russell C., "Lotka's Frequency Distribution of Scientific Productivity," 18 pp., Feb 1978, (Published in the Journal of the American Society for Information Science, Vol. 28, NO. 6, pp. 366-370, November 1977)

PP 217
Coile, Russell C., "Bibliometric Studies of Scientific Productivity," 17 pp., Mar 78, (Presented at the Annual meeting of the American Society for Information Science held in San Francisco, California, October 1976.)

PP 218 Classified.

PP 219
Huntzinger, R. LaVar, "Market Analysis with Rational Expectations: Theory and Estimation," 60 pp., Apr 78 (To be submitted for publication in Journal of Econometrics)

PP 220
Maurer, Don, "Diagonalization by Group Matrices," 26 pp., Apr 78