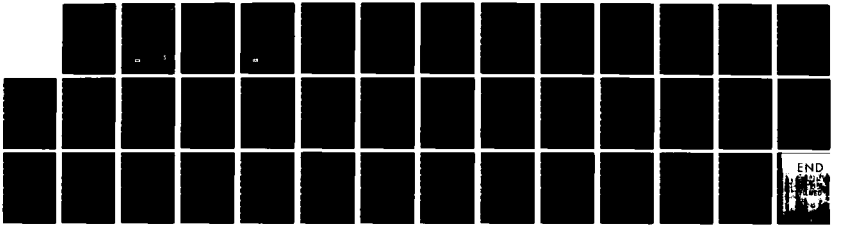
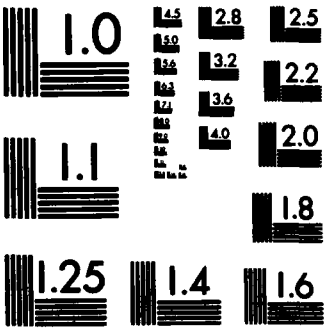
AD-A133 655 OLDER WORKERS IN THE MARKET FOR PART-TIME EMPLOYMENT 1/1
(U) PUBLIC RESEARCH INST ALEXANDRIA VA
J M JONDROW ET AL. AUG 83 PRI-PP-396

UNCLASSIFIED F/G 5/11 NL






MICROCOPY RESOLUTION TEST CHART
NATIONAL BUREAU OF STANDARDS-1963-A

PROFESSIONAL PAPER 396 / August 1983



# OLDER WORKERS IN THE MARKET FOR PART-TIME EMPLOYMENT

James M. Jondrow
Frank Brechling
Alan Marcus





The Public Research Institute
*A Division of the Center for Naval Analyses*

PROFESSIONAL PAPER 396 / August 1983

# OLDER WORKERS IN THE MARKET FOR PART-TIME EMPLOYMENT

James M. Jondrow
Frank Brechling
Alan Marcus



The Public Research Institute
*A Division of the Center for Naval Analyses*
2000 North Beauregard Street, Alexandria, Virginia 22311

This paper is an overview of our research for the National Commission for Employment Policy under contract number 99-2-3134-50-32. A detailed discussion of methods and results is provided in technical appendices, available separately from the authors as Professional Paper 397.

James M. Jondrow and Alan Marcus are economists with The Public Research Institute, Alexandria, Virginia. Frank Brechling is Professor of Economics at the University of Maryland. The authors are grateful for excellent research assistance from Debbie Hasson, Paul Knight, Anne Sicilia, and Tracy Goodis. Our colleagues Paul Feldman, Aline Quester, and Kathleen Utgoff made valuable comments. We also thank Steve Baldwin, Allen Gustman, Steve Sandell, and Laura von Behren for constructive comments. Responsibility for flaws remains with the authors.

This paper is an overview of our research for the National Commission for Employment Policy under contract number 99-2-3134-50-32. A detailed discussion of methods and results is provided in technical appendices, available separately from the authors as Professional Paper 397.

James M. Jondrow and Alan Marcus are economists with The Public Research Institute, Alexandria, Virginia. Frank Brechling is Professor of Economics at the University of Maryland. The authors are grateful for excellent research assistance from Debbie Hasson, Paul Knight, Anne Sicilia, and Tracy Goodis. Our colleagues Paul Feldman, Aline Quester, and Kathleen Utgoff made valuable comments. We also thank Steve Baldwin, Allen Gustman, Steve Sandell, and Laura von Behren for constructive comments. Responsibility for flaws remains with the authors.

## Executive Summary

This paper examines the sources and policy implications of the sparsity of part-time work among older workers. One starting point is the contradiction between expectation — that the transition out of the labor force will be gradual by means of part-time work — and what appears to be the reality — that retirement is sudden. Another starting point is the perception of older workers that part-time work at their current wage is scarce.

We begin by reviewing evidence from a number of data sets indicating that, despite statements by older workers that they have a strong interest in part-time work, in most cases retirement is sudden. The country's limited number of partial retirees are concentrated in a few industries (agriculture, service, finance/insurance/real estate). Partial retirement is rare in manufacturing, public utilities, and government.

Workers approaching retirement age are not spread evenly across industries. Construction, transportation, and finance/insurance/real estate have a higher-than-average proportion. The industries that retain the highest proportion of older workers are trade and government. The industries that accept older workers most readily from other industries are agriculture and trade.

After considering a number of hypotheses about why part-time work is rare, we conclude that employers find part-time workers to be more costly (per hour) and less productive than full-time workers. As a consequence, workers will be offered a lower hourly rate if they work part time than if they work full time. The prospect of low compensation for part-time work is less appealing than full retirement.

This explanation for sudden retirement is supported by a wide variety of evidence: (1) the employment costs themselves, (2) the lower pay for part-time workers, (3) the scarcity of part-time jobs for workers of all ages, (4) the prevalence of layoffs rather than reduction in hours in response to declining demand, (5) the concentration of part-time work among married women and students, and (6) the concentration of part-time work in low-wage industries.

Evidence on the last point is developed from two separate statistical analyses, one covering 13 manufacturing industries over 20 years, and the second involving cross-section analysis of 34 industries in 1970. In both analyses, compensation increases sharply with hours per week — holding other determinants constant. We also consider the effect of these other determinants of compensation: unionization, skill, education, percentage of male employees, age, and turnover.

The theory of sudden retirement is used to develop a mathematical model for policy analysis. Three potential changes in policy are analyzed: (1) a reduction of employment cost using the example of government mandated costs (such as the employer's social security contribution) (2) the removal of the social security earnings limit, (3) a subsidy for hiring older workers. The general finding is that these policies would not affect the retirement decision of a typical worker; retirement would be sudden in any case because hourly compensation is enough lower for part-time work to discourage any but full-time work.

## Introduction

Part-time work seems the natural way for older workers to make the transition from full-time work to retirement. Economic models of how workers make their long-run plans for work and consumption support this intuition. Further, in responding to surveys, older workers say that they want to retire gradually. Yet, sudden retirement, not part-time work, is the norm.

Why is retirement usually sudden? Is there a problem in this labor market? Are there Federal policies that would increase the availability of part-time work for older workers, without major cost to business or taxpayers? These are the central questions of our study.

Older workers say that they would like to work, but perceive that their current jobs would not be available on a part-time basis and that comparable part-time jobs are rare. If true, this perception raises further questions: Is the unavailability of part-time jobs particular to older workers — either because of discrimination or some other reason — or are part-time jobs scarce economy wide, and if so, why?

When we ask why retirement is sudden, it is not to suggest that the state of retirement itself is puzzling. It is easy to imagine preferences and rates of pay that would make not working preferable to working during part of one's life. What is puzzling (violating the usual assumption of gradualness) is the suddenness of the transition from working to not working. We inquire, in this paper, into the inconsistency between expectation — that older workers will retire gradually, going from full-time work, through part-time work, to retirement — and what observation suggests is reality — that most older workers retire completely without a transition period of part-time work.

## Retirement: Expectation and Reality

### THE EXPECTATION OF GRADUAL RETIREMENT

Workers themselves say they want to retire gradually. When workers were questioned about their retirement plans and preferences in three surveys, the majority expressed an interest in retiring gradually. One survey by the National Commission on the Aging (Sheppard and Mantovani) indicated that almost 80 percent of workers over 55 preferred the prospect of part-time employment to complete retirement; 60 percent of those who preferred part-time work wanted to stay at the same job.

In a second survey of older workers (Copperman), about 67 percent said they would "consider" part-time work as a step between full-time work and retirement. Most of these said they wanted to stay with the

same employer. The main reasons for interest in part-time work were to increase time for leisure or family activities.

A third survey (American Management Association) found that about 60 percent of managers surveyed "clearly prefer phased retirement to an abrupt stop, even if it means accepting a job with less authority and responsibility for some people."

Of course, survey results should be accepted with some caution. It is much easier to say that one would accept a demotion than to actually accept it. It is easier to say one prefers work to leisure than to actually perform the work when the time comes.

## CHARACTERISTICS OF PARTIALLY RETIRED MEN

An estimated 11 percent of the white males not self employed (workers plus retirees) between 62 and 64 years of age and about 17 percent of those between 65 and 69 years of age (Gustman and Steinmeier, 1981) call themselves partially retired. The figures probably exceed the actual number of part-time older workers since partial retirement is self-reported. Indeed, Gustman and Steinmeier report that about 35 percent of those reporting partial retirement were working over 80 percent of their full-time work week.

Partial retirees are most common in self-employment. Among those employed by others, partial retirees are concentrated in particular industries: agriculture (31.9 percent); finance, insurance, and real estate (23.8 percent); and personal service (28.1 percent) (Gustman and Steinmeier, 1981). They are least common in manufacturing (6.2 percent), transportation/communications and public utilities (9.8 percent), and public administration (10.0 percent). Cutting across industries, partial retirement is least common among those facing mandatory retirement. An explanation that seems likely to us is that workers who choose a job with mandatory retirement are, in effect, choosing to concentrate their work in their earlier years. Partial retirement is more common among those without a pension (as is full-time work), which suggests either a long-term plan to work continuously over the entire lifetime (e.g., a constant or diminishing taste for leisure with age) or some disaster that wipes out savings or pension. Finally, health problems do not seem to lead to partial retirement, but to full retirement.

Gustman and Steinmeier consider the effects on partial retirement of two wages: one for the nonretirement or "main" job and one for the partial retirement job. Of these, the dominant effect is the wage in the main job. A high wage in the main job discourages retirement outside the main job but not partial retirement within the main job.

## Policy Questions

As noted earlier, older workers perceive a scarcity of part-time jobs. The presumption is that many would like to work part time, but find that no jobs are available, or that the pay is low. These prospective part-time workers are likely to include those without a pension (who end up working full time) and those with a health problem (who end up fully retired).

There are several policy questions associated with this perception. First, are older workers being singled out — is there any indication of discrimination — or are part-time jobs either scarce or poorly paid economy wide?

Second, is there a failure of the market to provide part-time jobs even in a situation in which part-time jobs would be beneficial to both sides? For example, suppose that part-time work was less productive — per hour — than full-time work, and that older workers had a strong preference for part-time versus full-time work. Then, there would be mutually agreeable bargains that would involve lower wages and lower hours. There would be a policy problem if the wage failed to adjust in a way that would make these jobs feasible.

In addition to the general question of whether there is a policy problem in the market for part-time work among older workers, there is also the question of how existing Federal policies and recent or contemplated changes in policy affect this market. For example, what would be the effect of a change in social security contributions from employers? What would be the effect of an extension of the mandatory retirement age? What has been the effect of shifting the cost of health insurance for workers 65 to 69 from Medicare to employers? What would be the effect of a rise in the social security earnings limit? In the ensuing sections, we develop a model for analyzing questions like these and use the model to answer some of them.

## The Facts and Theories of Retirement

In this section, we investigate common patterns of retirement with special emphasis on whether part-time work is a common transition — i.e., whether retirement tends to be gradual. We first present the facts of retirement, then turn to theories that might explain them.

### COMMON PATTERNS IN WORK AND RETIREMENT FOR OLDER WORKERS

Despite the surveys and the expectation that retirement will be gradual, in most cases, retirement is sudden; it does not involve an extended period of part-time work.

Evidence on how weekly hours change as a worker grows older and the pattern of withdrawal from the labor force can be drawn from the Michigan Panel Study on Income Dynamics (PSID) data. Table 1 shows the split between full-time work, part-time work (34 hours or less per week), and labor force withdrawal at different ages. Between the ages of 55 and 61, 77 percent are full time; by age 62 to 64, only 37 percent are full time. But, while the proportion of full-time workers falls by about a half, there is not a corresponding rise in the proportion of part-time workers. Most of the decrease in full-time work shows up as an increase in the proportion of people not working at all.

It is possible to draw inferences about retirement patterns from cross-sectional data as we did in Table 1, but further insight can be drawn by using the longitudinal nature of the PSID data to observe individual retirement patterns. The first step in analyzing the longitudinal data was to examine a few data points to see if any common pattern was immediately apparent. Each of these illustrative data points consists of an entire hours profile, which gives the individual's hours of work (or earnings) at different points in his career. In the sudden retirement pattern, hours worked remain relatively constant until retirement and then drop precipitously to zero. In the gradual pattern, hours decline gradually as retirement approaches. In either case, retirement does not necessarily arrive on a particular birthday, say when the person turns 65. It can happen at any time.

Our initial examination of the data involved profiles of 20 workers: hours profiles from the Michigan Panel Study on Income Dynamics (PSID) data and earnings profiles from the Longitudinal Employer-Employee Data (LEED) file of Social Security records. The sudden retirement pattern dominated almost completely even though the retirement age varied from 56 to 71.

We also tabulated a large sample of worker profiles from the PSID data to determine if they showed a gradual reduction of hours just preceding retirement, i.e., a transition involving part-time work. Table 2 presents the weekly hours worked by individuals 1 and 2 years prior to retirement. These results confirm the previous findings that retirement is usually sudden. Except for those retiring after age 68, only about 15 percent were working part time in the year prior to retirement, compared to more than 20 percent working over 40 hours. The hours distribution 2 years prior to retirement is almost identical to that 1 year before retirement. The predominant pattern is that of full-time work followed by sudden retirement. There are workers who retire from a part-time status, but not many; more to the point, the incidence of part-time work does not increase much as retirement approaches.

It is important to note that the statistics in Tables 1 and 2 are derived from information reported directly by the worker. Those who say they are retired are counted as not working, but may, conceivably, be working part time. We did similar tabulations with the LEED data to

TABLE 1. FRACTION OF HEAD-OF-HOUSEHOLD WORKERS FULL TIME, PART TIME, OR NEITHER, BY AGE AND BY RACE: 1978[a]

| Age | Part time | | Full time | | Not working | |
|---|---|---|---|---|---|---|
| | | | Men | | | |
| | White | Black | White | Black | White | Black |
| 0-35 | 5.3 | 4.8 | 88.5 | 80.4 | 6.2 | 14.8 |
| 36-55 | 3.0 | 3.7 | 91.0 | 79.8 | 6.0 | 10.5 |
| 55-61 | 3.6 | 6.7 | 77.0 | 57.4 | 19.4 | 35.9 |
| 62-64 | 9.6 | 3.8 | 37.4 | 33.9 | 53.0 | 62.3 |
| 65-70 | 9.0 | 6.5 | 19.4 | 14.5 | 71.6 | 79.0 |
| 71+ | 6.1 | - | 5.6 | - | 88.3 | - |
| | | | Women | | | |
| 0-35 | 12.6 | 09.0 | 65.2 | 49.7 | 22.2 | 41.3 |
| 36-54 | 12.6 | 12.4 | 62.1 | 47.3 | 25.3 | 40.3 |
| 55-61 | 9.7 | 14.3 | 40.3 | 23.1 | 50.0 | 62.6 |
| 62-64 | 11.7 | 07.2 | 23.4 | 23.8 | 64.9 | 69.0 |
| 65-70 | 13.5 | 06.3 | 7.8 | 04.8 | 78.7 | 88.9 |
| 71+ | 4.7 | - | 1.0 | - | 94.3 | 95.0 |

[a]There were 4,398 men and 1,755 women in this sample.

Source: PSID data (1978 cross-section).

TABLE 2. HOURS WORKED PRIOR TO RETIREMENT

| Hours worked 1 year prior to retirement | Age at retirement (percent of workers) | | | |
|---|---|---|---|---|
| | < 62 | 62-64 | 65-67 | 68 + |
| 0-34 | 14.8 | 15.3 | 17.6 | 57.6 |
| 35-40 | 58.7 | 62.1 | 54.1 | 28.3 |
| 41+ | 26.5 | 22.6 | 28.3 | 14.1 |
| Hours worked two years prior to retirement | | | | |
| 0-34 | 12.9 | 11.8 | 15.7 | 57.0 |
| 35-40 | 58.9 | 60.7 | 50.6 | 19.0 |
| 41+ | 28.2 | 27.5 | 33.7 | 24.1 |
| Number of people = | 202 | 178 | 83 | 79 |

Source: PSID data (1978 cross-section).

check our PSID results, where earnings, not hours, measure the intensity of the work effort and self-reporting of work status is not involved.

Because the retirement age varies widely, we defined retirement, for the purposes of tabulation, as the point that earnings hit zero. Then, starting with the retirement year, we looked back 2 years and 5 years to see if there was a gradual decline of earnings leading up to retirement. If so, income 2 years before retirement should have been smaller than it was 5 years before retirement. The results are summarized in Table 3. About half of the observations exhibited the sudden retirement pattern, and there was no clear pattern among the rest. The number whose earnings were growing before retirement is about the same as the number whose earnings were falling. Rather than the predicted decrease in earnings, signaling passage from full-time to part-time, there seemed to be random fluctuations in income before retirement.

## DISTRIBUTION OF PRERETIREMENT WORKERS ACROSS DIFFERENT INDUSTRIES

Older workers are not spread evenly across industries. Some industries have a concentration of older workers, some have a concentration of younger workers, and over time, the concentrations shift among the industries.

We used the social security (LEED) data to tabulate the age distribution by industry and to find those industries with the highest proportion of older workers in 1957 (the first year of this data) and 1975 (the last year). Industries were divided into three groups: older-worker industries (those with the highest percentage of workers over 45), median-worker industries, and younger-worker industries (those with the smallest share in the oldest group). About one-third of the industries were placed in each group for the 2 years — 1957 and 1975 — wherever there are more or less than one-third of the workers in a particular age category, it is to reflect natural groupings.

Categorizing the detailed industries by type -- manufacturing, trade, service, construction, trade, and financial — reveals some general patterns (Table 4). In 1957, there was a modest tendency for manufacturing industries to have a larger percentage of older workers than the norm and for trade and service industries to have younger workers. In 1975, construction, transportation, and finance (insurance and real estate) tended to have older workers. In both years, services tended to have younger workers.

The age group composition of the detailed industries shifts gradually over time (see Figure 1). The older industries in 1975 were not necessarily older in 1957. Of 22 detailed industries classified as older in 1975, 10 were older in 1957, 8 were median in 1957, and 4 were from younger industries. The industries moving from younger to older were personal service, private households, lumber and wood products, and

TABLE 3. FREQUENCY OF ANNUAL EARNINGS PRIOR TO RETIREMENT
(Table entries are numbers of people.)

| Annual earnings 2 years prior to retirement (thousands of 1970 dollars) | Annual earnings 5 years prior to retirement (Thousands of 1970 dollars) | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| | 1-2000 | 2-4 | 4-6 | 6-8 | 8-10 | 10-12 | 12-14 | 14 + | Total People |
| $1-2000 | 3 | 4 | 3 | 0 | 0 | 1 | 0 | 0 | 11 |
| 2-4 | 7 | 78[a] | 28 | 12 | 11 | 5 | 1 | 3 | 145 |
| 4-6 | 2 | 21 | 43 | 18 | 2 | 1 | 1 | 2 | 90 |
| 6-8 | 0 | 1 | 20 | 55 | 12 | 4 | 0 | 1 | 93 |
| 8-10 | 0 | 3 | 2 | 18 | 44 | 9 | 6 | 1 | 83 |
| 10-12 | 0 | 0 | 0 | 2 | 18 | 28 | 8 | 3 | 59 |
| 12-14 | 0 | 0 | 0 | 0 | 3 | 12 | 8 | 5 | 28 |
| 14 + | 0 | 0 | 0 | 0 | 2 | 0 | 7 | 7 | 16 |
| Total | 12 | 107 | 96 | 105 | 92 | 60 | 31 | 22 | 525 |

[a]Gradual retirement above diagonal

Table

| | Percentage | Number |
|---|---|---|
| Earnings constant (diagonal) | 51 | 266 |
| Earnings falling (above diagonal) | 27 | 141 |
| Earnings growing (below diagonal) | 22 | 118 |
| Total | 100% | 525 |

Source: LEED File, sample drawn from people born in 1904. Years of observation are 2 and 5 years before retirement, whatever year that might be.

TABLE 4. AGE DISTRIBUTION BY INDUSTRY TYPE
(Table entries are the number of detailed industries in each category.)

| Age of the Worker | Type of Industry | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| | Agric. | Mining | Construct. | Manuf. | Trans. | Trade | Fin. | Ser. |
| | | | 1957 | | | | | |
| Older | 0 | 1 | 7 | 2 | 2 | 1 | 5 | 0 |
| Median | 0 | 2 | 7 | 1 | 4 | 1 | 3 | 0 |
| Younger | 2 | 1 | 0 | 4 | 0 | 3 | 4 | 9 |
| | | | 1975 | | | | | |
| Older | 0 | 1 | 10 | 1 | 3 | 2 | 5 | 0 |
| Median | 0 | 1 | 7 | 0 | 4 | 1 | 5 | 0 |
| Younger | 1 | 1 | 0 | 1 | 2 | 2 | 1 | 5 |

Source: Tabulations from LEED file.

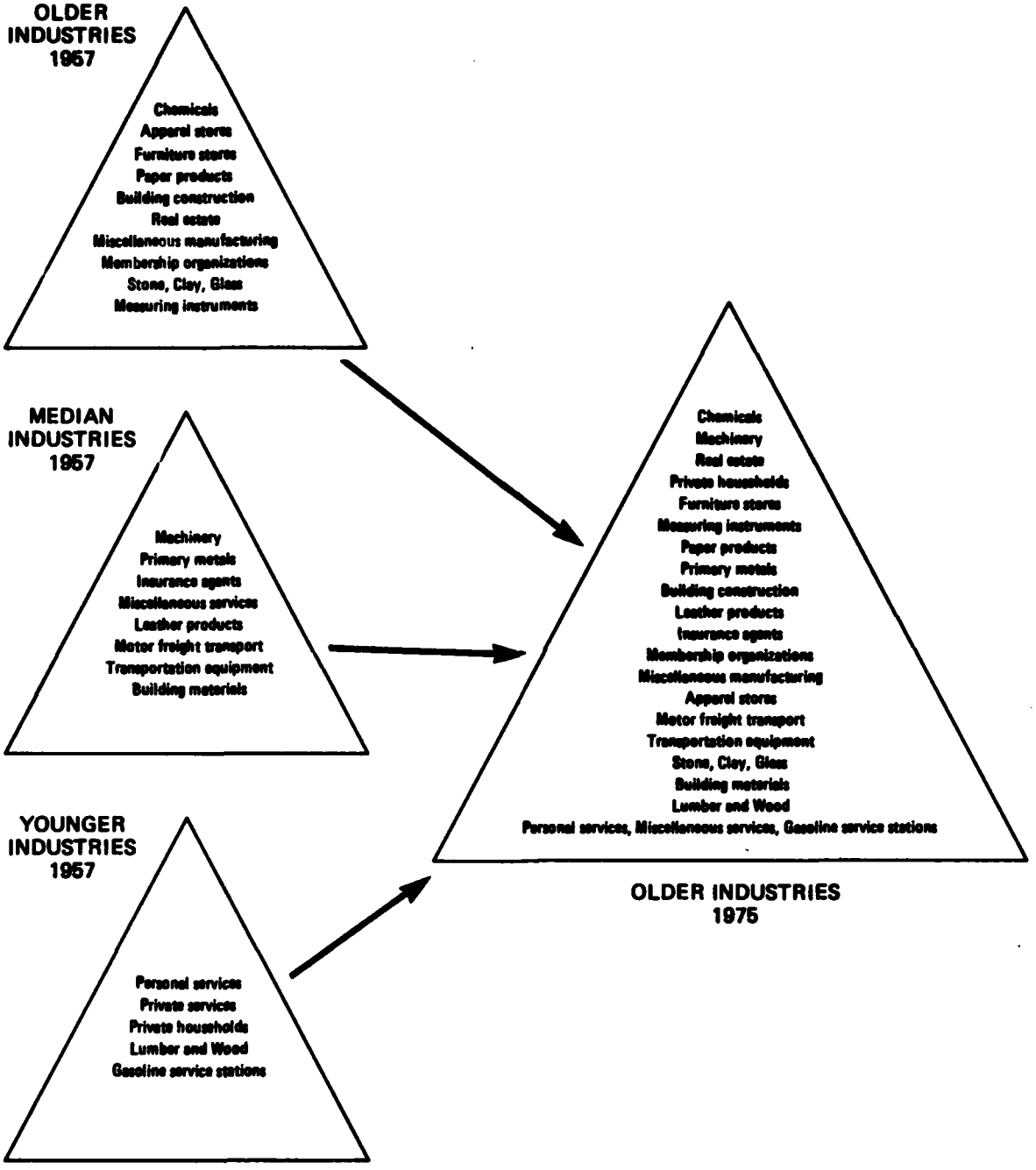



**FIG. 1: SHIFT IN AGE-GROUP COMPOSITION BY INDUSTRIES 1957-1975**

gas service stations. (Further detail on the Social Security tabulations of age composition by industry is available in a technical appendix available from the authors.)

## WHICH INDUSTRIES ARE MOST RECEPTIVE TO OLDER WORKERS?

Those industries with a high proportion of older workers can achieve that status in one of several ways: (1) By expanding employment little or even by contracting it — so that the work force ages, (2) by retaining older workers rather than retiring them, and (3) by hiring older workers from other industries. Industries in the last two categories can be termed "receptive" to older workers.

Which industries are most receptive in the sense of retaining older workers? To answer this, consider attrition rates of older workers, age 62-65, and ages 66 plus, presented in Table 5. The attrition rates are presented by standard industrial category (SIC) 1, a number designating an industry in federal statistics. For example, each year mining and construction (SIC 1) loses 35 percent of its workers between ages 62 and 65, of which 31 percent retire and 4 percent change industries. This is the second highest attrition rate among the 10 industries, and it indicates that mining and construction are not receptive. When industries are ranked by this measure, those most receptive to older workers, i.e., those with the lowest attrition rates, are trade and government.

If the measure is fraction of workers received from other industries, the rankings are as shown in Table 6. From this, it is clear that a job change is a rare event, involving only about 6 percent of all workers age 62-65, compared to the 23 percent that retire each year. For those workers who <u>do</u> change jobs rather than retire, the most receptive industries are agriculture and trade.

Several points need to be made about the extreme receptiveness of agriculture. First, it is most receptive in the sense of receiving workers from other industries, least receptive in the sense of retaining them. There are a number of conjectures that might explain the situation.

First, agriculture may just be a high-turnover activity where workers enter and leave freely. Second, social security payments may have high, real value for those in rural areas, encouraging retirement, which would explain the high attrition rate. Third, our classification of workers to industries in our application of the LEED data is on the basis of industry of greatest earnings. It seems likely that many farm owners or farm workers hold other jobs while they are farming. When they leave those other jobs, in their 60's, farming becomes their primary job. There is evidence for one part of the conjecture: that second jobs are disproportionately agricultural (see Taylor and Sekscenski).

TABLE 5. ATTRITION RATES, RETIREMENT RATES, AND JOB CHANGE RATES FOR OLDER WORKERS

| | | Age 62-65 | | | Age 66+ | | | | |
|---|---|---|---|---|---|---|---|---|---|
| | Standard Industrial Classification | Attrition Rate (%) | Retirement Rate (%) | Job Change Rate (%) | Attrition Rate (%) | Retirement Rate (%) | Job Change Rate (%) | Number of Observations | |
| Agriculture, forestry, fishery | 0 | 50 | 20 | 30 | 21 | 17 | 4 | 10 | 24 |
| Mining and construction | 1 | 35 | 31 | 4 | 31 | 25 | 6 | 52 | 32 |
| Manufacturing | 2 | 31 | 23* | 9 | 32 | 30 | 2 | 141 | 63 |
| | 3 | 28 | 25 | 3 | 50 | 39 | 11 | 153 | 46 |
| Transportation, communications, public utilities | 4 | 30 | 28 | 2 | 27 | 27 | 0 | 60 | 30 |
| Trade | 5 | 21 | 13 | 8 | 20 | 17 | 3 | 206 | 183 |
| Finance, insurance, real estate | 6 | 26 | 17 | 9 | 33 | 22 | 10 | 66 | 49 |
| Services | 7 | 27 | 24 | 4 | 34 | 31 | 3 | 55 | 74 |
| | 8 | 24 | 21 | 4 | 29 | 20 | 9 | 180 | 150 |
| Government | 9 | 21 | 15 | 6 | 22 | 16 | 5 | 71 | 55 |
| Overall | | 27 | 21 | 6 | 28 | 23 | 5 | 994 | 706 |

* Subtotals do not always add to totals because of rounding.

TABLE 6. NEW WORKERS AS A PERCENTAGE OF ALL WORKERS WHO MOVE (1972-73)

| | Standard Industrial Classification | 62-65 (%) | 66+ (%) |
|---|---|---|---|
| Agriculture, forestry, fishery | 0 | 49 | 50 |
| Mining and construction | 1 | 5 | 5 |
| Manufacturing | 2 | 8 | 3 |
| | 3 | 0 | 5 |
| Transportation, communication, public utilities | 4 | 0 | 0 |
| Trade | 5 | 20 | 8 |
| Finance, insurance, real estate | 6 | 3 | 5 |
| Services | 7 | 5 | 11 |
| | 8 | 8 | 8 |
| Government | 9 | 0 | 5 |
| Number of workers changing industries | | 59 | 38 |
| Total workers | | 994 | 706 |

Source: LEED tabulations.

## Theories of Retirement

In order to make sense of the facts about retirement, we inquire if there are standard economic theories that can explain these facts and whether these theories point to a problem in the market — a role for Federal policy.

### LIFE-CYCLE THEORY

One such theory is the "life-cycle" theory — the standard economic explanation of how plans for work and spending are made (and followed) over an entire lifetime. According to the theory, the worker, at the beginning of his career, plans consumption, savings, and hours of work over his whole lifetime. This plan gives people the option of, for instance, choosing when to retire, given relative earning abilities at different times. (Of course, their plans might change over time, but the plans will still have an effect. For example, if they plan to retire, they will save. These savings will then have an effect on behavior at retirement age, regardless of how plans have changed.) The plans can be represented as a set of equations connecting consumption, work, and other determinants such as wage rates and workers' attitudes toward work and leisure. The important thing about these equations is that they imply that hours cannot go from 40 per week to zero per week without passing through the values in between. The speed of this transition will depend on how fast the determinants, such as the wage, are moving. There's nothing in the life-cycle theory itself that suggests sudden retirement.

This is not to say that the life-cycle theory cannot handle sudden retirement. If one of the determinants, such as the wage, changes abruptly, so will hours worked. An abrupt change in the after-tax wage could result from the social security earnings limit or from a pension plan available only to workers who quit. The point is that the life-cycle theory itself does not point to sudden retirement.

### THE THEORY OF MANDATORY RETIREMENT

An intuitive explanation for sudden retirement is that it is mandatory: imposed by law or by the employment rules within specific firms. In itself, this is not a satisfactory explanation. We need to know why retirement is mandatory and why mandatory retirement prevents part-time work. Recent research by Lazear interprets mandatory retirement as necessary to terminate a bargain between worker and employer. This bargain, which is implicit, not contractual, involves workers receiving less than their value to the firm early in their careers and more than their value to the firm late in their careers. At some point, workers' value to the firm becomes less than their value to another employer or the value placed on leisure, but because wages are artifically high, they will not leave the firm and have to be forced to retire.

Why do workers and employers consider it desirable for workers to be paid less than they are worth at the start and more at the end? Lazear's answer is that a sharply rising wage encourages full effort, which makes workers more productive all along and makes both workers and employers better off.

There are several difficulties with this theory. First, if the full-time wage exceeds workers' value to the firm toward the end of their careers, why do employers not reduce the employees' hours to part time? Such a reduction will obviously not eliminate employers' problem of the wage exceeding the value produced, but it will limit the damage.

Second, and more important, even if retirement is necessary to end the implicit bargain, the theory does not explain the failure of workers and employers to negotiate a new contract with fewer hours and a lower wage, equal to workers' actual value to firms, when the original bargain runs out. Indeed, Lazear explicitly recognizes that his theory allows renegotiation. But renegotiation usually does not occur; Gustman and Steinmeier (1981) confirm that workers subject to mandatory retirement do not usually work for the same firm afterwards, even part time. The fact that retirement is mandatory simply does not explain the suddenness of full retirement.

## THE THEORY OF HUMAN CAPITAL

The theory of human capital draws on an analogy between physical capital and human skill. Skill is like physical capital in that there is investment (training), an extended return, and depreciation (loss or obsolesence of skill) over time. Some skills are specifically associated with a particular job; they have value only in a given firm or establishment. The existence of such job-specific human capital provides the rationale for workers' attachment to one firm over a long period (this attachment is one necessity for the Lazear theory) and for the workers' finally leaving (a necessity for any theory of retirement, Lazear's included). Workers will remain with the firm because the specific human capital yields a return available only so long as workers and firm stay together. The returns are split between workers and the firm, which encourages them to stay together. However, none of the theories we have discussed so far provide a full explanation of why part-time work is infrequent.

## Our Preferred Theory

Our preferred explanation of why part-time employment for older workers is not the norm draws on the research of Barzell, Lewis, and H. Rosen. The essence of our theory is that part-time work is less productive and more costly to employers, per hour, than full-time work. As a consequence part-time workers get a lower compensation, per hour, than full-time workers, and in making lifetime plans, workers place emphasis on either full-time work or complete retirement.

The idea that part-time work is more costly, per hour, than full-time work requires some explanation. We start with the distinction between employment costs that are actually a form of compensation (such as health insurance) and those that are not (such as job-specific training, which is of value only to the firm). The former costs are similar to wages. Even if they were higher per hour for part-time workers than full-time workers and so required that part-timers accept a lower wage to make up the difference, part-time workers would accept the lower wage because nonwage compensation was higher per hour. What discourages part-time work are those employment costs that are not considered compensation and that do not shrink proportionately as hours are reduced below full time.

### CONSIDERING BOTH WORKER AND EMPLOYER PERSPECTIVES

Note that our explanation of the scarcity of part-time work assumes that decisions about wages and hours are made by both workers and employers; it recognizes that there are two sides to the employment bargain. Workers tend to shy away from part-time work because it is low paid relative to full-time work. Employers offer low pay for part-time work because part-time work involves a penalty in productivity and employment costs. It is the interaction of the workers' and employers' responses to the unattractive features of part-time work that results in part-time work being far less common than full-time work or retirement.

## Results and Interpretation

### EMPIRICAL EVIDENCE

We review six types of empirical evidence that help to choose among the theories: (1) the employment costs themselves, (2) the lower pay for part-time workers, (3) the scarcity of part-time work for all workers (especially the scarcity of jobs with very few hours, for example, below 15 hours per week), (4) the use of temporary layoffs rather than hours reduction to adjust to declining demand, (5) concentration of part-time work among workers for whom full-time work is particularly costly, and

(6) the pattern of cross-industry part-time work. We first present the evidence, then turn to an interpretation.

## SIZE OF THE EMPLOYMENT COSTS

There are a number of fixed employment costs that workers do not perceive as compensation. These include the costs of training, hiring, administration (such as the cost of issuing the payroll), start-up costs, federally mandated reporting, antidiscrimination, and safety costs, as well as supervision costs. There are also the costs of fitting in part-time workers with full-time workers — scheduling costs.

Most of these cannot readily be measured, but we can get rough estimates of some. Consider the cost of training a new worker — older or younger — as an example. Training is like capital in that it requires an initial outlay and generates returns over time. To compare such costs with wages and salaries we must convert training cost to an annual cost: interest cost plus depreciation. Here, depreciation takes the form of separations, skill loss, or obsolescence.

Suppose that each newly hired worker requires 3 months to train (a typical value from the Dictionary of Occupational Titles, gets paid two-thirds of the average employment cost during this period, and requires supervision amounting to one-third of the time of a fully paid colleague.* Suppose, too, that the interest rate is 10 percent per year, the separation rate is 30 percent (about typical for manufacturing), and the skill depreciation, 14 percent (nearly complete loss over 10 years if there is no retraining). The resulting training cost is about 13 percent of total employment costs. Hiring costs annualized in a similar fashion are about 1 percent of total cost. These two categories of employment costs are compared with others in Table 7.

We have estimated several other types of fixed nonremunerative costs and identified several categories that we cannot measure. We expect that the total of employment costs is much greater than the 14.5 percent of costs we calculate for hiring and training.

A major issue is whether training costs apply to older workers who have remained with a single firm and new hires (of any age) alike; i.e., is it reasonable to analyze these different groups together? To be sure, older workers have, at some point, received training. It is usually assumed, however, that skill depreciates over time; i.e., it becomes obsolete or is gradually lost. This assumption is useful in providing a ready explanation for retirement. The explanation starts with the notion

* The argument in this section ignores the possible output of the trainee.

TABLE 7. EMPLOYMENT COSTS

| Type of cost | Fixed or variable | Remunerative or nonremunerative | Estimated % of Measured Cost |
|---|---|---|---|
| Training | Fixed | Nonremunerative | 13.5 |
| Hiring | Fixed | Nonremunerative | 1.0 |
| Wages & salary | Variable | Remunerative | 53.6 |
| Benefits: | | | |
| Pension | Variable | Remunerative | 4.5 |
| Health ins. | Fixed[b] | Remunerative | 5.1 |
| Other | | Remunerative | 3.2 |
| Time off with pay | Variable | Remunerative | 11.5 |
| Federally mandated expenditure: | | | |
| FICA | Variable up to high maximum | Nonremunerative | 5.4 |
| UI contributions | Variable up to a maximum | Nonremunerative | 1.0 |
| Workman's Comp. | Variable | Nonremunerative | 1.2 |
| Other[a] | | Nonremunerative | |
| Supervision costs | Variable | Nonremunerative | |
| Total | | | 100 |

[a] Statistical reporting requirements, paperwork, income tax reporting, and health and safety requirement.

Source: U.S. Chamber of Commerce: Employee Benefits - 1981, Table 8 and our own estimates (first two lines).

that the skills are specific to the firm. It is this specificity that binds workers and firm together; they are worth more together than separately. When the skills depreciate, the reason for the firm and workers remaining together is diminished. When depreciation is complete, the reason for the match is gone. The result is retirement or a job change. According to this explanation of retirement, younger workers and older workers can be analyzed as a homogeneous group. We should emphasize, however, that there is no independent evidence that productivity declines with age or that, if there is a decline, it completely eliminates the skills originally drawn from training.

## LOWER PAY FOR PART-TIME WORKERS

The theory predicts that compensation per hour will fall off sharply as hours are reduced below full time. We have estimated a pay differential for employed working wives such that a reduction in hours worked per week from 35 to 20 reduces hourly pay by almost 40 percent. Using other data, J. Owen and (independently) H. Rosen conclude that the penalty is somewhat smaller, 30 percent as compared with our estimates of 40 percent. In any case, there is a well-documented hourly penalty paid by workers who work part time.

## SCARCITY OF PART-TIME JOBS

The theory predicts that jobs involving only a few hours per week will be extremely rare because it wouldn't be worth it for either employees or the employers. Output would not exceed fixed employment costs, leaving nothing to compensate the worker. Even at higher hours, compensation would not overcome the value of workers' forgone leisure until hours get near full time. These predictions of the theory are confirmed. The distribution of hours worked in the main job (Figures 2 and 3) shows a bunching of hours around 40 per week; jobs involving fewer than 10 to 15 hours per week are indeed very rare.

## PART-TIME WORK AS THE BEST ALTERNATIVE

The theory predicts that, because it offers relatively low compensation, part-time work will be uncommon and will be the preferred alternative mainly of those facing obvious extra costs of full-time work. Indeed, part-time work is heavily concentrated among workers whose other commitments are likely to make full-time work more costly and inconvenient: married women with husband present and workers of student age. (See Table 8.)

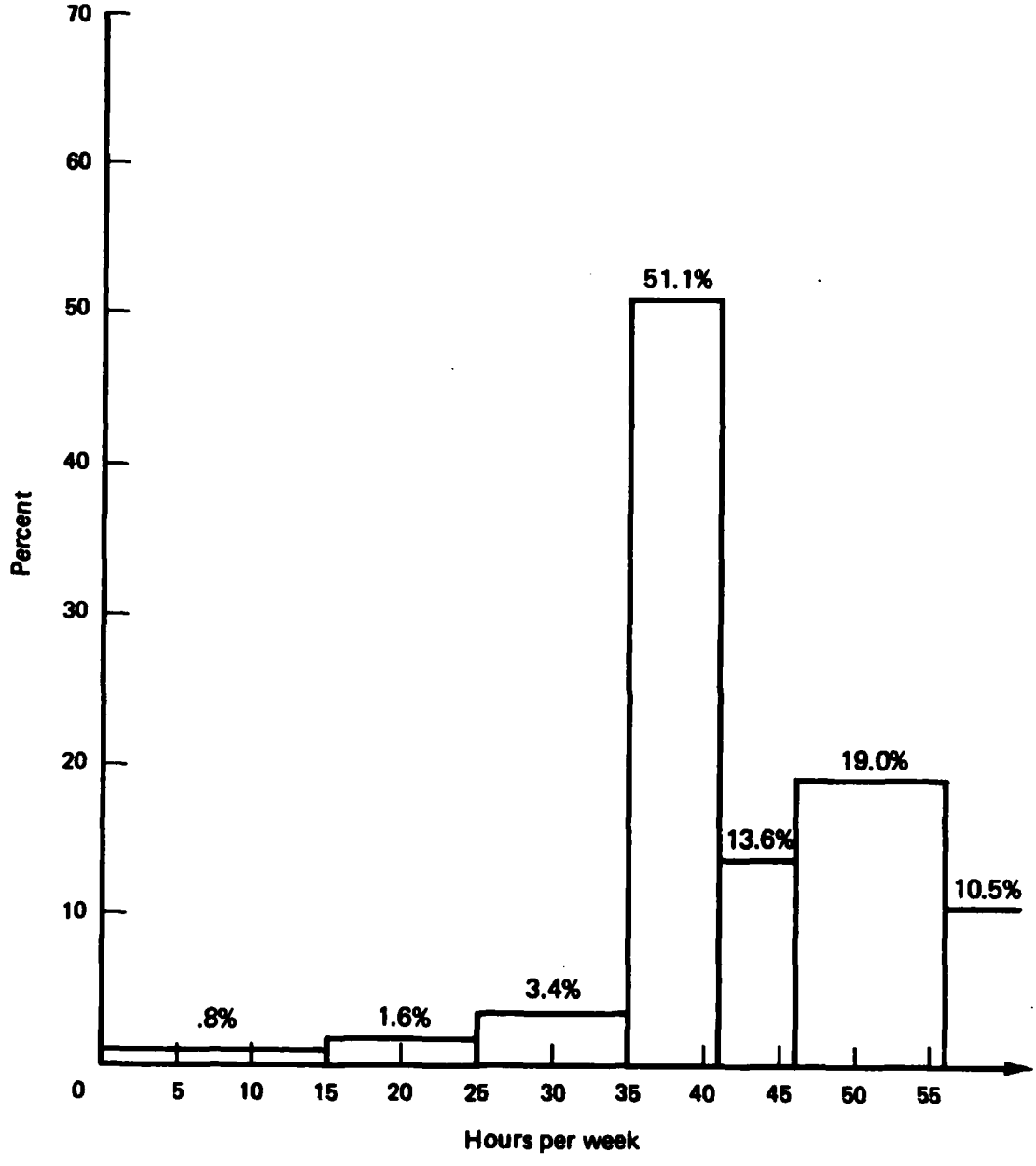



**FIG. 2: DISTRIBUTION OF HOURS WORKED PER WEEK BY MEN**

*Source: PSID Data – 1978 Cross Section*

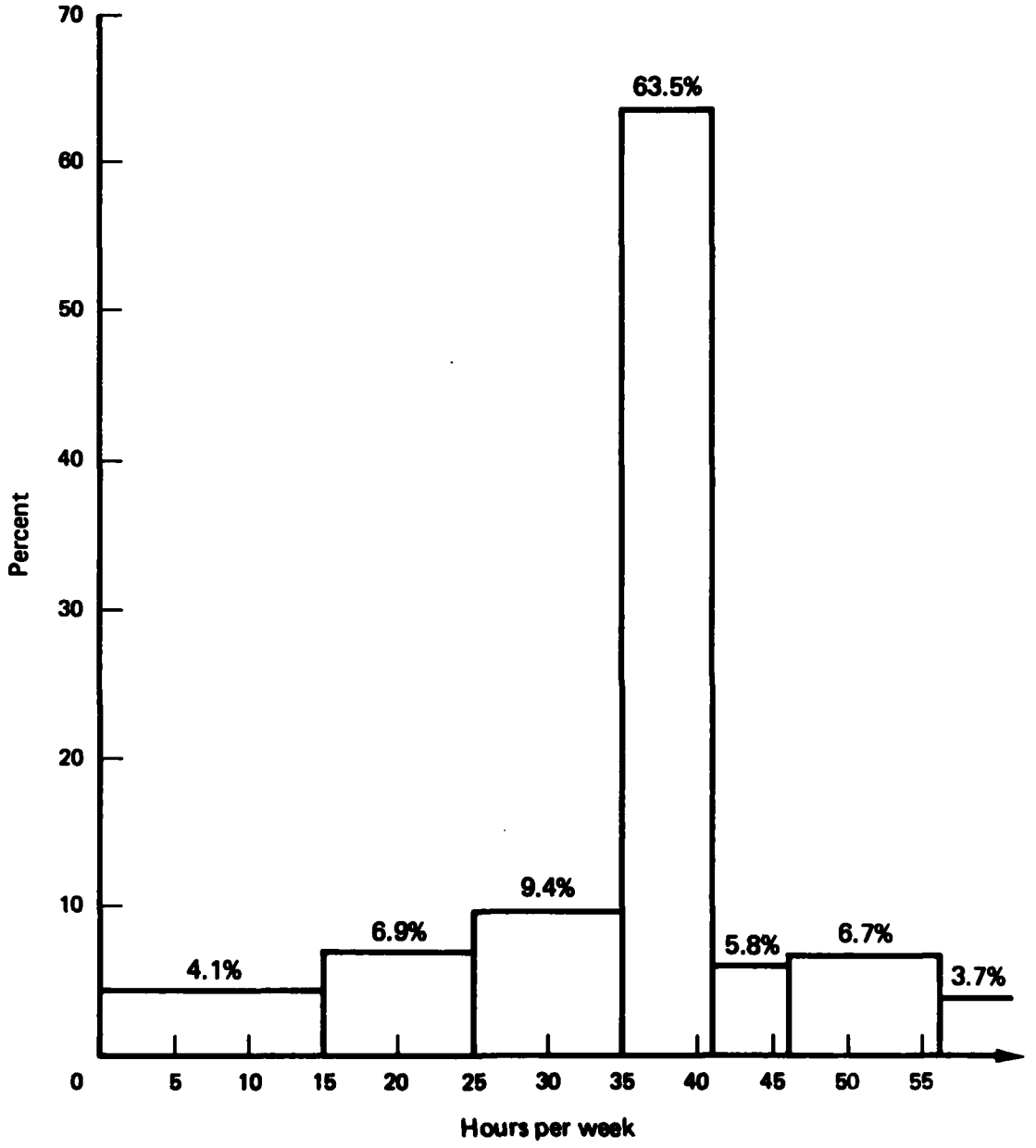



**FIG. 3: DISTRIBUTION OF HOURS WORKED PER WEEK BY WOMEN**

*Source: PSID Data – 1978 Cross Section*

TABLE 8. LABOR FORCE STATUS BY AGE AND SEX (1981 Annual Averages)

| | Full-Time Worker (%) | Part-Time Worker (%) | Not in Labor Force (%) |
|---|---|---|---|
| Men and Women (16-19) | 29 | 26 | 45 |
| Men and Women (65+) | 5.7 | 6.3 | 88 |
| Married Women (husband present)[a] | 36 | 15 | 49 |
| All Categories | 55 | 9 | 36 |

[a] Overlaps with age categories. Base is all married women, 16+, with husband present.

Source: Employment and Earnings, January 1982.

## LAYOFFS IN RESPONSE TO DECLINING DEMAND

Another prediction of the theory is that firms will respond to temporary declines in demand by reducing employment, rather than hours, because reducing hours sharply reduces productivity. In fact, temporary layoffs are a more common way to accommodate decreased demand than reduced hours. This is not to say that reduced hours ("part time for economic reasons" in some Federal statistics) are never used, but that the layoffs are more common.

## CONCENTRATION OF PART-TIME WORK IN LOW-WAGE INDUSTRIES

Although the theory does not make sharp predictions about the cross-industry pattern of part-time work, it does predict that (holding constant other factors, such as skill) part-timers will be more prevalent in the lowest wage industries; i.e., the part-time penalty is evident in cross-industry data as well as cross-individual data. The evidence is clear at two levels of detail: simple tabulations and detailed statistical investigations.

Consider first a simple tabulation. Inspection of Table 9 suggests that full-time work and high earnings go together (construction, transportation, manufacturing) and that a higher incidence of part-time work is related to lower hourly earnings (services, wholesale and retail trade).

The association between a low incidence of part-time work and higher hourly earnings also is evident in a careful statistical analysis. The data base includes 13 manufacturing industries traced over 20 years. Instead of the incidence of part-time work, the variable examined is the average hours worked. We examined the joint determination of hours and compensation using the statistical technique of multiple regressions. Hours and compensation depend on each other and a number of other determinants: the capital-labor ratio, the percentage of workers over 65, average years of education, percentage male, percentage of union work force, specific vocational preparation, and labor turnover.

The primary finding is that compensation rises more than in proportion to hours. This means that compensation per hour falls as hours are reduced below full time — i.e., the part-time penalty appears in cross-industry data.

Other findings are that the percentage of workers over 65 tends to reduce compensation, but raise hours; unionization and skill both tend to raise compensation and lower hours. So long as labor turnover is considered a pure determinant of hours and compensation (turnover also can be treated as jointly determined with them), turnover seems to reduce compensation and raise hours. It acts as a fixed employment cost, which must be paid for out of compensation and encourages long hours (to recoup the costs).

TABLE 9. PART-TIME WAGE AND SALARY WORKERS BY INDUSTRY AND OCCUPATION (1981 Average)

| Industry | Percentage of part-time workers who are in category | Percentage of category that is part-time | Average hourly earnings of production workers ($) |
|---|---|---|---|
| Services[a] | 44 | 20 | $ 6.41 |
| Wholesale and retail trade | 38 | 25 | 5.93 |
| Finance, insurance, real estate | 5 | 10 | 6.31 |
| Manufacturing | 6 | 3 | 7.72 |
| Transportation and public utilities | 3 | 6 | 9.70 |
| Construction | 2 | 4 | 10.80 |
| Public administration | 2 | 5 | — |
| Total wage and salary | 100 | 13 | — |
| Self-employed and family | — | 18 | — |
| Occupation | | | |
| Service workers | 30 | 30 | — |
| Sales workers | 12 | 24 | — |
| Clerical workers | 25 | 18 | — |
| Professional, technical, managerial & administrative | 18 | 9 | — |
| Blue collar | 15 | 7 | — |

[a]Examples include hospital workers, hotel workers, teachers.

Source: Employment and Earnings, September 1982.

A major finding of our statistical work is that the general results hold up also in another data set: a pure cross section of 34 industries in 1970. The cross-section estimates allow a wider range of industries to be considered than the pooled data (trade and service industries are added) and also include a slightly different set of explanatory variables. The cross-section estimates closely confirm the pooled estimates. In addition, they indicate that self-employment raises hours (probably by removing statutory penalties for overtime), and that larger plant sizes raise hours and compensation. Our interpretation of this latter result is that larger plant sizes involve more teamwork. The higher compensation is the return on being part of the team, the greater hours reflect an added premium on full-time work — part-time work is hard to schedule into a team situation.

## INTERPRETATION OF THE EVIDENCE

We interpret the empirical evidence that we have reviewed as being broadly consistent with the view that part-time work is less productive and more costly per hour to employers than full-time work, and that employees, therefore, usually make their career plans in such a way as to avoid part-time work. In this section, we discuss how each piece of evidence fits with this theory.

Employment costs provide a partial explanation of why part-time work is not economical to employers. The employment costs we were able to document make up only a fraction of the costs necessary to explain the second piece of evidence, however — the lower pay for part-time work. This lower pay implies that there is an additional cost to employers of offering part-time work: lower productivity at low hours. The third type of evidence — the scarcity of part-time jobs involving very few hours — is exactly the type of response one would expect in a case where part-time work suffered from a cost or productivity penalty, so that almost all employees and employers made other arrangements. Related evidence is that those employees who do accept part-time work are those for whom full-time work is especially costly, married women and students. The use of temporary layoffs to respond to temporary declines in demand is also the type of thing that would be expected from a cost or productivity loss from reduction in hours from full-time work.* The final type of evidence was the cross-industry pattern of part-time work. Here we found that industries with a great deal of part-time work had lower hourly earnings, which accords, once again, with the theory that part-time work suffers from low productivity or inability to spread employment cost over a number of hours.

* It should be noted that there are other theories that also explain temporary layoffs; for example, see Feldstein for an explanation in terms of specific human capital.

## Policy Implications

### MARKET FAILURE

We started out by noting that our purpose was to inquire whether some problem in the labor market restricted the availability of part-time work, i.e., whether the lack of part-time work by older workers necessarily implied a failure in the market. We concluded that it did not; a coherent theory of how hours of work are determined explains the lack of part-time work, is consistent with the evidence, and does not point to a market failure.

This theory is based on a decline in productivity as hours fall below full time and an increase in employment costs per hour. As a consequence of these costs (such as training), employers offer part-timers low hourly compensation. Most workers respond by avoiding part-time work — either working full time or retiring completely, with a sudden transition — retirement — between the two.

There may be other explanations that do involve a market failure, but they are neither necessary nor obvious. The thrust of our theory is that a Federal policy directed toward part-time work is not necessary or desirable on the grounds of elimination a market failure.

### DISCRIMINATION

One of the important implications of the theory and one of the important results of the empirical analysis is that the scarcity of well-paid, part-time jobs is not a matter of discrimination against older workers — such jobs are scarce economywide.

### THE EFFECT OF SOME PRESENT AND PROSPECTIVE POLICIES

Even if there is no impetus for a new policy initiative, there are many government* policies that might affect the market for older part-time workers. We examined two of them: social insurance taxes and the social security earnings limit. Social insurance taxes, including Social Security, Unemployment Insurance, and Workers' Compensation, are government mandated costs. We also considered a hypothetical subsidy for older workers.

---

* Note that the policies we are considering for illustrative purposes are not purely Federal. In particular, unemployment insurance involves each State, and any policy change would involve massive cooperation among the States. Thus, reducing social insurance taxes is even more hypothetical than it seems.

There is some question whether social security is remunerative or not, i.e., whether current contributions should be viewed as purchasing future benefits. We treat it as nonremunerative because current contributions do not necessarily guarantee a particular level of future benefits. Social insurance includes both fixed elements and variable elements. Lowering them raises compensation per hour. The premium for full-time work rises, which encourages more work. But the increase in compensation makes the extra work less necessary, an effect that militates against more work. These conflicting effects make the outcome uncertain.

So far, the discussion has assumed that individuals continue working. Social insurance contributions might be cause for retirement; if so, removing social insurance contributions will draw workers back into the labor force. But, they are unlikely to reenter only part time because of the part-time penalty. They may move from retirement to full-time work, but not to part-time jobs.

To calculate the effect of social insurance costs involves using a mathematical model, which is both an extension and a simplification of our discussion above. The extension is a mechanism for allowing people to choose no work (retirement) over work. How can workers afford to do this? The answer is that our discussion has focused only on the final period of work, not all periods. The reason they can forgo work in the final period is that they have worked in earlier periods. Thus, the decision of how much to work in the final period is part of a larger plan — how much to work in earlier and later periods. The simplification is that there are only three periods in the model (age 21-55, 56-65, 66+). The model is designed so that, without any fixed cost or part-time penalty, typical individuals would reduce their hours from period to period (40, 30, 20).

The development and detailed results from the model are available in an appendix available from the authors. To summarize results, any part-time penalty over 5 percent will lead to full retirement rather than reduced hours at age 65. This result is unchanged when social insurance taxes (such as social security taxes) are eliminated. In other words, social insurance taxes have no effect on part-time work among older workers.

The social security earnings limit, by imposing a large tax penalty on extra earnings, cuts down compensation per extra hour after some point. The result discourages full-time work and, if the limit is set low enough, part-time work. Workers are led to adjust their earnings so as not to exceed the earnings limit either by working few hours per week (which encourages part-time work) or by leaving the job market altogether when they reach the limit. Thus, part-time work at high hours and full-time work are discouraged, while part-time work at low hours and full retirement are encouraged.

The mathematical analysis indicates that the effect of the earnings limit depends on the extent of the part-time penalty. If the part-time penalty in per-hour compensation is relatively modest (less than 10 percent), the earnings cap reduces hours in the final period from about 30 hours to about 17 hours. On the other hand, if the part-time penalty is higher, work in the third period is eliminated altogether by the earnings limit. However, for a part-time penalty greater than 25 percent, workers would have retired anyway, so that the earnings limit has no effect. This last case is the one that corresponds to empirical estimates of the part-time penalty.

The mathematical analysis was applied also to a hypothetical subsidy for older workers. Under the hypothetical program, workers over 65 are paid $20 per week if they work. For very low penalties for part-time work (0 to 5 percent), the subsidy would have no effect — older workers would work about 20 hours in either case. If the part-time penalty were 10 or 15 percent, the program would bring older workers out of retirement — to work about 23 hours. For the higher part-time penalties that have been estimated empirically, the program would have no effect — older workers would retire in either case.

To summarize the policy analysis, the Federal programs that we have considered have little effect on the retirement pattern of the typical older worker. The reason is that the estimated part-time penalty is strong enough that workers would retire in any case — with or without Federal policy changes.

## Conclusion

We have examined one theory of why there is so little part-time work among older workers: that part-time work is poorly compensated because of employment costs and the lower productivity of reduced hours. Our research involved developing the theory, marshalling evidence to test it, and illustrating its use for answering policy questions.

There are other possible explanations of the lack of part-time work that are likely to act alongside of our explanation. Though we have not investigated these alternatives closely, they are worth noting briefly as examples of further research that is needed. One alternative explanation is a sudden change in the determinants of take-home wages. We have considered one determinant, the social security earnings limit. There may be others. A second alternative is older workers' lesser desire for fringe benefits. Fringe benefits seem most useful to younger workers who maintain households. For instance, an older worker with Medicare will have less interest in health insurance than a younger worker. (For an analysis of recent changes in Medicare and the effect on the employment of older workers, see the Anderson paper, prepared recently for NCEP.) To the older worker, a higher portion of fringe

benefits will be nonremunerative. Clearly, this difference between older and younger workers fits naturally within the framework of our theory.

Returning to the policy issue, even though the government probably could change the part-time market for older workers, the theory we have presented and the evidence that supports it do not suggest that this would necessarily be beneficial. That so few older workers hold part-time jobs is not due to an unavailability of part-time work; it simply reflects the reality that part-time work does not pay very well. The low pay for part-time workers is general -- it is not restricted to older workers. We noted earlier that part-time work is concentrated among married women and students. These are workers whose other commitments raise the personal cost of full-time work. There is no obvious reason to believe that older workers are kept out of this market or that they would be better off if they were eased into it by Federal policy. Instead, older workers rationally choose sudden retirement over part-time work.

Further, specific Federal policies that we tested proved ineffective. The part-time penalty dominates the impact of any policy we considered.

## Bibliography


Anderson, Joseph M.; Kennel, David L.; Sheils, John F., "Estimated Effects of 1983 Changes in Employer Health Plan/Medicare Payment Provisions on Employer Costs and Employment of Older Workers," Final Report to the National Commission on Employment Policy, June 1983.

American Management Association. "Survey Reveals Growing Interest Among Managers in Phased Retirement," AMA Forum. January 1982, pp. 34-35.

Barzel, Yoram, "The Determination of Daily Hours and Wages," Quarterly Journal of Economics, 87, 1973.

Copperman, Lois F.; Fred D. Keast; and Douglas G. Montgomery, "Older Workers and Part-Time Work Schedules," Personnel Administrator, October 1981, pp. 35-37.

Feldstein, Martin, "Temporary Layoffs in the Theory of Unemployment," Journal of Political Economy, Vol. 84, No. 5, October 1976, pp. 937-959.

Ghez, Gilbert and Gary S. Becker, The Allocation of Time and Goods Over the Life Cycle, NBER. New York: Columbia University Press, 1975.

Gustman, Alan T. and Thomas T. Steinmeier, "Minimum Hours Constraints and Retirement Behavior," NBER Working Paper #940, July 1982.

Gustman, Alan T. and Thomas T. Steinmeier, "Partial Retirement and the Analysis of Retirement Behavior," NBER Working Paper #763, September 1981.

Lazear, Edward P., "Why is There Mandatory Retirement?" Journal of Political Economy, Vol. 87, No. 6, December 1979, pp. 1261-1284.

Lewis, H.G., "Interes del Employeador en las Horas de Tobajo del Empleado," "The Employer Interest in Employees' Hours of Work," Cuadernos de Economia, 18, summarized in Rosen, Harvey (reference below), 1969.

MaCurdy, Thomas E., "An Empirical Model of Labor Supply in a Life-Cycle Setting," Journal of Political Economy, Vol. 89, No. 6, December 1981, pp. 1059-1085.

Owen, John D., "Workweeks and Leisure: An Analysis of Trends, 1948-1975," Monthly Labor Review, August 1976, pp. 3-8.

Rosen, Harvey S., "Taxes in a Labor Supply Model with Joint Wage-Hours Determination", Econometrica, Vol. 44, No. 3, May 1976, pp. 485-507.

Sheppard, Harold T. and Richard E. Mantovani, Part-Time Employment After Retirement. Hartford, Conn: The Travelers Insurance Companies, 1982.

Taylor, Daniel E. and Edward S. Sekscenski, "Workers in Long Schedules, Single and Multiple Job Holders," Monthly Labor Review, May 1982, pp. 47-52.

U.S. Chamber of Commerce; Employee Benefits, 1981.

## INDEX TO PRI PUBLICATIONS

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 339 *The Economic Effects of Environmental Expenditures on the Constructions Industry*, James Jondrow, David Chase, Christopher Gamble, Louis Jacobson, Robert Levy, Bruce Vavrichek, September 1979.

CRC 349 *The Unemployment Insurance Tax and Labor Turnover: An Empirical Analysis*, Frank Brechling and Christopher Jehn, April 1978.

CRC 353 *The Tax Base of the U.S. Unemployment Insurance Tax: An Empirical Analysis*, Frank Brechling, April 1978.

CRC 367 *The Quit Rate as a Measure of Job and Pay Comparability*, Frank Brechling and Louis Jacobson, August 1979.

CRC 385 *Earnings Loss Due to Displacement*, Janet Thomason and Louis Jacobson, August 1979.

CRC 386 *Do Finances Influence Airline Safety, Maintenance, and Service?* David R. Graham and Marianne Bowes, April 1979.

CRC 388 *The Economics of Research and Development*, Lawrence Goldberg, October 1979.

CRC 414 *Taxes on Factors of Production: Their Effects on Factor Proportions and Inflation*, Marianne Bowes, Frank Brechling, Kathleen Classen Utgoff, and Bruce Vavrichek, December 1979.

CRC 419 *Labor Adjustment to Imports Under Rational Expectations*, Robert A. Levy and James M. Jondrow, September 1980.

CRC 423 *Earnings Losses of Workers Displaced by Plant Closings*, Arlene Holen, Christopher Jehn and Robert Trost, December 1981

CRC 431 *Evaluating Tax Systems for Financing the Unemployment Insurance Program*, Marianne Bowes, Frank P.R. Brechling, and Kathleen P. Utgoff, June 1980.

CRC 440 *Using Quit Rates to Set Compensation Levels in the Public Sector*, Kathleen C. Utgoff, January 1981.

CRC 441 *The Value of Stable Employment as Inferred From Market Wages*, Robert P. Trost, February 1980.

CRC 442 *Cost Differences in Public and Private Shipyards: A Case Study*, Marianne Bowes, October 1981.

CRC 451 *The Effect of UI Administrative Screening on Job Search*, Louis Jacobson and Ann Schwarz-Miller, June 1982.

CRC 452 *The Availability of Administrative Data to Analyze Trade Adjustment Assistance and Displacement*, Janet Thomason and Louis Jacobson, September 1981.

CRC 458 *The Effect of Declining Employment in Buffalo and Providence on Workers' Earnings and Mobility*, Louis Jacobson, January 1982.

CRC 459 *The Earnings and Compensation of Workers Receiving Trade Adjustment Assistance*, Maureen Cropper and Louis Jacobson, February 1982.

CRC 461 *Availability of Matchable Employment and Health Data*, Paul Feldman, March 1982.

CRC 487 *The Adjustment of Employment To Technical Change In Steel, Autos, Aluminum, Coal, and Iron Ore*, Robert A. Levy, Marianne Bowes, and James M. Jondrow, June 1983.

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

PP 166 *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, 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.

PP 232 *Can Policy Changes Be Made Acceptable to Labor?* Louis S. Jacobson, August 1978.

PP 233 *An Alternative Explanation of the Cyclical Pattern of Quits*, Louis S. Jacobson, October 1978.

PP 234 Revised *Does Federal Expenditure Displace State and Local Expenditure: The Case of Construction Grants*, James Jondrow and Robert A Levy, October 1979.

PP 238 *Unemployment Insurance and The Unemployment Rate*, Kathleen Classen Utgoff, October 1978.

PP 246 *Layoffs and Unemployment Insurance*, Frank Brechling, February 1979.

PP 266 *Taxes and Inflation*, Frank Brechling and Kathleen Classen Utgoff, November 1979.

PP 267 *The Response of State Government Receipts to Economic Fluctuations and the Allocation of Counter-Cyclical Revenue Sharing Grants*, Robert G. Vogel and Robert P. Trost, December 1979.

PP 282 *Labor Adjustment Under Rational Expectations*, James M. Jondrow and Robert A. Levy, December 1980.

PP 299 *Wage Leadership in Construction*, James M. Jondrow and Robert A. Levy, January 1981.

PP 300 *On the Estimation of Technical Inefficiency in the Stochastic Frontier Production Function Model*, James Jondrow and Peter Schmidt, January 1981.

PP 301 *Technical Change and Employment in Steel, Autos, Aluminum, and Iron Ore*, James M. Jondrow, Robert A. Levy and Claire Hughes, March 1981.

PP 302 *The Effect of Imports on Employment Under Rational Expectations*, Robert A. Levy and James M. Jondrow, April 1981.

PP 311 *An Evaluation of UI Funds*, Marianne Bowes, Frank P.R. Brechling, and Kathleen P. Classen Utgoff, May 1981.

PP 312 *The Optimum Speed Limit*, James Jondrow, Marianne Bowes, and Robert Levy, May 1981.

PP 375 *Privatizing Airports in Washington, D.C.*, Paul Feldman, February 1983.

PP 379 *The Price Differential Between Domestic and Imported Steel*, James M. Jondrow, David E. Chase, and Christoper L. Gamble, May 1983.

PP 382 *The Adjustment of Employment to Technical Change in the Steel and Auto Industries*, Robert A. Levy, and James M. Jondrow, May 1983

PP 396 *Older Workers in the Market for Part-Time Employment*, James M. Jondrow, Frank Brechling, and Alan Marcus, August 1983

PP 397 *Appendices to Professional Paper 396: Older Workers in the Market for Part-Time Employment*, James M. Jondrow, Frank Brechling, and Alan Marcus, September 1983

PP 398 *Technical Change and Employment in the Steel, Auto, Aluminum, Coal, and Iron Ore Industries*, Robert A. Levy, Marianne Bowes, and James M. Jondrow, September 1983


FIL