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**Dead-End Jobs or Stepping Stones?
The Long-Run Consequences of Early Industry and
Occupation**

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Abstract

Dead-end jobs can be defined as a line of work in one's early work history that leads to lower long-run wages. This study shows how early lines of work predict long-run worker wages and finds that there are significant differences in this relationship based on the skill level of the worker. In general, service-producing lines of work appear to penalize long-run wages, especially for low-skilled workers. Low-skilled workers in retail food/foodservice lines of work rank about in the middle of the spectrum between dead-end jobs and stepping stones. Long-run wage potential is better in retail food/foodservice than in manufacturing/operative jobs. On the other hand, early experience in retail food/foodservice leads to lower long-run wages, all else equal, compared to early experience in a professional services industry (other than health) and a non-business professional occupation. Overall, this research provides evidence that early line of work matters to a worker's long run wages at all skill levels; there is little difference between men and women. These results are based on analyzing data from the National Longitudinal Survey of Youth, 1979.

Key words: Long term wages, early occupations, retail food, foodservice,

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Dead-End Jobs or Stepping Stones?

The Long-Run Consequences of Early Industry and Occupation

Introduction

A variety of U.S. public programs, such as school-to-work programs, minimum and living wage legislation, and aspects of welfare reform, have sought to assist the working poor and/or reduce their number. These initiatives are intended to connect those vulnerable to poverty with labor force activity that will, ideally, provide long-term economic security through sustained employment and wage growth. But the working poor often have few marketable skills to work with and face great challenges in identifying a successful work strategy. Long-term economic success for these individuals could potentially come from many different employment paths, but there is very little evidence to-date of the strategies most likely to produce success. One area where this lack of understanding exists is in the role of early line of work. In the context of public policy debates, a split often emerges in the way that people think about early employment experiences for the less-skilled. Some believe that the jobs held by the less-skilled early in their careers are “stepping stones” to higher wages and sustained employment. Others believe that these jobs are more likely to be “dead end” jobs, keeping workers in a trap of low wages and instability.

This research attempts to differentiate between lines of work that are likely to be “stepping stones” and others that tend to be “dead ends”. A better understanding of the role of early line of work could help improve individual decision-making and inform programs such as welfare-to-work which often focus on the early phase of an individual’s career. Using data from the National Longitudinal Survey of Youth of 1979 (NLSY79), this study examines the

impact of early industry and occupation experience on long run hourly wage and weekly wage. In addition to analyzing the sample as a whole, the sample is split into skill groups to focus on less-skilled individuals who are expected to be more vulnerable to poverty. “Dead-end jobs” are defined as those early lines of work that are related to lower long run wages, all else equal.

The analysis reveals that the worker’s main early line of work is significant in determining his/her long run wages. Results of wage estimations show that there can be long run penalties if a worker has early experience in service-producing lines of work, especially for low-skilled workers. The results also show, however, that service-oriented work is not always the most harmful to worker’s long run wages. Low-skilled workers with early experience as manufacturing operators, for example, fare worse in the long run than those with early experience as service workers in retail food.

Literature Review

The body of literature on the long run impacts of early line of work is quite small. In the research that exists it is common to focus on the impact of beginning one’s career in the service sector. One such study asked whether a worker started his/her career in a service-producing industry (Gardecki and Neumark 1998). The authors expected that this indicator would be negatively related to long run wages since jobs in service-producing industries often pay low wages. The study found that this variable was not statistically significant in long run wage estimations and concluded that there was no wage penalty from starting one’s career in a service-producing industry.

It is more common for studies to examine the economic mobility of a worker between different income levels. For example, researchers have examined worker movement between

low and high-paying jobs in the first ten years after leaving formal schooling (Gritz and MaCurdy 1992). Using NLSY79 data, they define low-wage jobs in two ways: (1) those that pay in the lowest quintile of the wage distribution for all workers in the monthly Current Population Survey; and (2) those that pay up to \$1 over the federally legislated minimum wage. The authors suggest that their findings do not support the idea of early experience in low-paying jobs as a “trap”. Of the high school dropouts or graduates that begin a low-wage job, half find a high-wage job within 15 months and 90 percent find a high-wage job in 3 to 5 years. Gritz and MaCurdy find that increased early work experience of any kind corresponds to increased future time in high-paying jobs. While they do address the “dead-end” job issue, studies of this kind do not provide insight on the long run impact of early experience in specific industries and occupations.

Model of Worker Wages

While the long-run consequences of early line of work are discussed frequently in political rhetoric they rarely find their way into economic theory. Traditional human capital theory pays little attention to the differences in job characteristics that might affect a worker's returns from early employment. Lazear notes that in traditional human capital theory, wages and wealth are determined exclusively by a worker's knowledge and skills so the job he/she holds plays no role (Lazear 1995). Often industry and occupation are found to be significant in predicting earnings, but there is no justification for this in the traditional theory. However, Lazear points out that human capital theory can acknowledge the important differences between jobs if each job is viewed as a unique investment opportunity. Since firms, industries, and occupations can have different production technologies, each job carries with it different

opportunities for human capital growth and, therefore, different opportunities for earnings growth.

Oi discusses the idea of certain industries or occupations as providing “stepping stone jobs” (Oi 1980). He suggests that these entities must have a comparative advantage in producing job-training, screening, or simply supplying work situations that enable new entrants to establish evidence of general human capital, such as track records of reliability and honesty. In competitive markets these employers will be compensated for these services, probably through lower wages. Workers would ideally then follow the process of "stepping stone-to-landing rock" as part of an equilibrium path of lifetime earnings maximization.

This study attempts to capture the importance of early industry and occupation experience by including them as predictors of a worker’s long run wages. This study estimates a worker’s long run wage based on the following model:

$$Y = f(P,X,T,J,M,E)$$

where the worker’s long run economic outcome (hourly or weekly wage) is a function of:

- § personal characteristics (P) that measure aspects of the worker's general human capital or worker constraints and characteristics of the worker's residence or environment that could be expected to impact labor market outcomes,
- § cumulative work experience (X) (i.e., this is work experience accumulated over the worker’s career in all jobs held),
- § tenure (T) in the worker’s current job, industry, and occupation (i.e., this is the length of time the worker has been with the employer, industry, and occupation that he/she is currently working in),
- § job characteristics (J) associated with the worker's current job,

§ mobility history (M)¹, and

§ early line of work (E) that captures the industry and occupation that the worker has the most early experience with in the first five years he/she reported not attending school².

Data

This research makes use of the National Longitudinal Survey of Youth of 1979 to estimate this model of long run employment outcomes. The NLSY79, sponsored by the Bureau of Labor Statistics, began in 1979 interviewing 12,686 young people aged 14 to 22 that year. The sampled individuals were interviewed annually from 1979 to 1994, and biannually since then. The NLSY79 respondents were between the ages of 33 and 41 in 1998 so this data set provides a unique opportunity to connect individual employment histories with relatively long-term outcomes. Since the earnings analyses concern long-term outcomes, many of the variables such as wage and tenure are final-period variables. 1998 data is taken as the final period. The data from the remaining survey years, 1979-1996, are combined with the 1998 data to create the variables that reflect the worker's labor market experiences over this entire period. Since the focus is on 1998 outcomes, the analysis includes only those respondents who are interviewed in 1998.

Skill Groups

The purpose of separating individuals into sub-samples in this study is to identify “economically at-risk” respondents who are more vulnerable to poverty over their lifetime. Often, a measure of skill level is used to differentiate those with higher vulnerability and the term low-skilled comes to identify this group. When separating individuals into skill groups

¹ This is part of a larger research study that also investigates the impact of a worker's mobility between industries, occupations, and jobs on long-run wages.

² This five-year period is the definition of “Early” throughout the paper.

there is often controversy about the measure used to define skill. It would be ideal to find a measure that represents individual ability, independent of factors such as formal education. AFQT (Armed Forces Qualifying Test) performance has been used in many social research studies as a measure of skill level. Those who use the test score contend that, although it rises with education, it also has meaning beyond educational attainment (for an example, see Pavetti 1997).

This research also uses AFQT performance to divide the respondents into skill groups.³ AFQT scores are based on a test administered to all respondents in 1980. Since the respondents were as much as 8 years apart in age at the time of the test, each individual's score is divided by the mean score for his/her age group to get an "age-standardized" score. The age-standardized scores are then divided into quartiles, where the first quartile represents the lowest 25 percent of scores (low-skilled group) and the fourth quartile represents the highest 25 percent (high-skilled group). The middle two quartiles are then grouped together to represent a medium-skilled group. Table 1 provides descriptive statistics for the entire sample as well as for the individual skill groups.

³ I will use group labels that identify individuals as having less or more "skill" based on their AFQT performance. Some might argue that someone with a low AFQT score should be said to have low "ability" or "aptitude" rather than skill but I will adopt the more conventional "less-skilled" and "high-skilled" terminology. Pavetti 1997 does the same.

Table 1: Descriptive Statistics

	Entire Sample		Low-Skilled		Medium-Skilled		High-Skilled	
	Mean	Std Dev	Mean	Std Dev	Mean	Std Dev	Mean	Std Dev
1998 Outcomes								
Weekly Wage	606.21	496.77	514.29	409.06	586.58	441.21	715.46	632.34
Hourly Wage	14.67	11.05	12.43	9.78	14.18	9.63	17.38	13.76
Unemployed	0.04	0.20	0.07	0.25	0.04	0.19	0.02	0.12
Out of the Labor Force	0.15	0.36	0.23	0.42	0.13	0.33	0.10	0.30
Personal Characteristics								
Age in 1998	36.82	2.25	36.78	2.28	36.74	2.23	36.90	2.25
Bad Health	0.15	0.24	0.18	0.24	0.15	0.24	0.12	0.24
Less than HS Education	0.13	0.33	0.34	0.47	0.07	0.26	0.01	0.08
1-3 Yrs Post-HS Education	0.22	0.41	0.10	0.31	0.27	0.44	0.24	0.43
4+ Yrs Post-HS Education	0.19	0.39	0.02	0.13	0.13	0.33	0.51	0.50
Hispanic	0.19	0.39	0.25	0.43	0.20	0.40	0.09	0.29
Black	0.30	0.46	0.56	0.50	0.29	0.46	0.07	0.26
Female	0.51	0.50	0.48	0.50	0.54	0.50	0.48	0.50
Married in 1998	0.55	0.50	0.38	0.49	0.56	0.50	0.71	0.45
Number of Children	2.04	1.55	2.34	1.71	2.01	1.51	1.75	1.37
South in 1998	0.41	0.49	0.53	0.50	0.40	0.49	0.30	0.46
SMSA in 1998	0.81	0.39	0.79	0.41	0.81	0.39	0.83	0.38
Rural in 1998	0.30	0.46	0.26	0.44	0.31	0.46	0.33	0.47
Other Variables								
Food Stamp Usage in 1998	0.14	0.35	0.19	0.39	0.07	0.25	0.01	0.11
Welfare Receipt in 1998	0.08	0.28	0.29	0.45	0.12	0.32	0.04	0.19
Total Experience and Tenure								
Total Experience (months)	179.75	81.46	163.62	85.26	182.64	80.99	191.81	75.23
Job Tenure (months)	70.21	68.08	64.80	66.72	69.87	68.27	75.76	69.04
Industry Tenure	3.50	4.27	3.06	3.94	3.45	4.28	3.97	4.50
Occupation Tenure	2.36	3.32	2.11	3.18	2.35	3.29	2.67	3.55

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	Entire Sample	Low-Skilled	Medium-Skilled	High-Skilled
Early Line of Work	(Mean Values)			
Early Industry Category:				
Ag, Forestry, Mining, Construction	0.11	0.12	0.11	0.10
Manufacturing	0.17	0.16	0.17	0.19
Transportation, Communications, Utilities, and Wholesale Trade	0.05	0.04	0.05	0.06
Retail Food	0.15	0.14	0.15	0.13
Other Retail	0.11	0.09	0.12	0.12
Finance, Insurance, Real Estate, and Business	0.08	0.06	0.09	0.10
Repair, Personal, and Recreation Services	0.08	0.08	0.08	0.05
Health	0.07	0.06	0.06	0.07
Professional Services other than Health	0.10	0.09	0.08	0.14
Public Administration	0.04	0.04	0.04	0.04
Early Occupation Category:				
Non-Business Professional	0.11	0.06	0.10	0.19
Business Professional	0.09	0.05	0.09	0.13
Secretaries, Cashiers, Clerks	0.07	0.07	0.08	0.07
Other Clerical	0.14	0.11	0.14	0.15
Craftsmen, Mechanics	0.08	0.07	0.09	0.09
Operatives	0.14	0.15	0.14	0.12
Laborers	0.11	0.15	0.12	0.07
Low-Skilled Service other than Food	0.10	0.13	0.10	0.08
Food Service	0.10	0.10	0.11	0.09
Unclassified	0.05	0.11	0.04	0.02

Wage Estimation

Long run weekly and hourly wages are estimated as follows:

$$\ln(W_i) = \alpha_i + \beta_1 P_i + \beta_2 J_i + \beta_3 X_i + \beta_4 T_i + \beta_5 M_i + \beta_6 E_i + \epsilon_i$$

for individual i , where

- § W is a measure of the worker's 1998 wage (in this case, both hourly and weekly wage reported at the time of the 1998 interview),
- § P includes the following personal characteristics as of the 1998 interview: age, health, gender, race, education, South, SMSA, and rural/urban,
- § J includes the following job characteristics for the worker's main job at the time of the 1998 interview: union status, broad industry identifier, and broad occupation identifier,
- § X includes the worker's cumulative work experience and its square,
- § T includes the worker's tenure and its square associated with his/her current main job, industry, and occupation,
- § M includes job, industry, and occupation mobility,
- § E includes industry and occupation identifiers that indicate the dominant early line of work, and
- § ϵ represents a random error term.

Both weekly and hourly wages are estimated using the Heckman selection model and the selection equation regressors include many of the same regressors as the wage equation including personal characteristics (P), cumulative experience variables (X), and mobility history variables (M). Additional selection equation regressors include current marital status, number of children, and number of late involuntary job changes. I did attempt to increase the number of

identifying variables in the selection equation, but the results were unchanged.⁴

Industry and Occupation Variables

In the model of long run economic outcomes, current job characteristics (J) include broad industry and occupation identifiers for the respondent's main job at the time of the respondent's 1998 interview. These broad industry and occupation identifiers are constructed using the 1970 Census Industrial and Occupational Classification codes. Any industry or occupation code with at least 2% representation (for the main jobs at the time of the 1998 interview) is maintained as its own category. If an individual code had less than 2% representation among NLSY respondents, then the industry codes are grouped similar to the way they are grouped in the Census classification system until the group represents at least 2%. This process of constructing narrow industry and occupation categories, which is very similar to the process used by Bartik (Bartik 1997), results in 18 industry categories and 21 occupation categories. Since the 1998 industry and occupation identifiers are not the main variables of interest, these narrow categories are collapsed into 4 industry and 5 occupation categories to characterize the main line of work for the respondent at the time of the 1998 interview. The 18 industry and 21 occupation categories are used, however, to calculate other variables such as industry tenure, occupation tenure, industry mobility, and occupation mobility.

In constructing the Early Industry and Occupation variables, the narrow industry and occupation identifiers are again utilized. I want the Early Industry and Occupation variables to represent the worker's "main" line of work during the first 5 years he/she is out of school (again, this 5-year period is the study's definition of "early"). The NLSY79 captures industry and occupation for up to 5 jobs per year. First, I look to see if one of the 18 industry categories is a dominant category for the respondent (i.e., the category is reported more than all others) in this

⁴ Highest Grade Completed by Head Parent was also included as an extra regressor in the selection equation and, although it was often significant in predicting labor force participation, it did not alter the wage regression results. It was removed because missing data in the variable reduced the sample size.

early 5-year period. If the respondent does have a dominant early industry then this is assigned to be the worker's Early Industry. If he/she does not have a dominant early industry, the worker's Early Industry is simply the one he/she holds at the end of the 5-year period. If the respondent has no dominant early industry and is unemployed or out of the labor force at the end of the 5-year period, the respondent is designated as "Unclassified". The Early Industry value is missing if the respondent has no dominant industry and is employed but fails to report an industry category in the fifth year. The same process is followed to generate an Early Occupation variable.

The 18 industry and 21 occupation identifiers found in the Early Industry and Occupation variables are collapsed to 10 industry and 9 occupation categories. I collapse them because the analyses that follow ultimately divide respondents based on skill level and gender. The reduced sample sizes that result from this sample splitting mean that if the narrow identifiers are used, a number of the industry and occupation combinations have few or no workers. The resulting categories are presented in Table 2. Manufacturing and Retail Food top the industry list, together claiming one-third of all workers. The most populated occupations are Other Clerical and Operatives. Table 3 then gives the percentages of respondents whose early industry and occupation are missing or "Unclassified". Not surprising, the number of "Unclassified" respondents falls with skill level since low-skilled workers are more likely to be unemployed or out of the labor force. There is no such pattern in the missing values.

Table 2: Early Industry and Occupation Categories for the Entire Sample

Industry Categories	Percent of Workers
Manufacturing (Durable and Non-Durable)	17.6
Retail Food (Food Stores and Eating & Drinking Establishments)	15.4
Other Retail	11.3
Agriculture, Forestry, Mining, and Construction	11.1
Professional Services other than Health (e.g., Education, Social Services)	10.0
Finance, Insurance, Real Estate, and Business	9.2
Repair, Personal, and Recreation Services	8.4
Health (Hospitals, Institutions, and Other Health)	7.2
Transportation, Communications, Utilities, and Wholesale Trade	5.3
Public Administration	4.5

Occupation Categories	Percent of Workers
Other Clerical	14.6
Operatives	14.2
Non-Business Professionals (Health, Education, Social Services, Protective Service, Technicians, Entertainment)	11.9
Laborers	11.7
Low-Skilled Services other than Food (e.g., Cleaning, Health, Child Care)	11.3
Food Service	10.8
Business Professionals (Management and Sales)	9.4
Craftsmen and Mechanics	8.4
Secretaries, Cashiers, and Clerks	7.8

Table 3: Respondents without Defined Early Industry/Occupation

	Entire Sample	Low-Skilled	Medium-Skilled	High-Skilled
Missing	5.1%	5.1%	5.8%	3.8%
Unclassified	5.7%	11.6%	4.6%	1.6%

Table 4 shows the most popular early industry and occupation combinations for the entire sample. The list is dominated by lines of work that are traditionally considered rather low-skilled, being topped by food service in the retail food industry. Of the ninety possible combinations, the top four industry/occupation combinations encompass over one-quarter of all workers. This table also shows the proportion of workers in each of these categories when respondents are broken into skill groups. While their proportion of workers declines with skill level, Manufacturing/Operative and Retail Food/Food Service are two of the top three combinations shown for each skill group. Across skill groups, the percentages corresponding to low-skilled services, laborers, and operatives all fall as skill level rises. The percentage of workers in low-skilled service occupations (including food service) falls from 22 percent for low-skilled workers to 16 and 8 percent for medium and high-skilled workers, respectively. In contrast, the presence of professional work rises with skill level. Professional occupations (non-business and business) account for 18 percent of high-skilled workers but only 7 percent of medium-skilled workers and 3 percent of low-skilled workers.

Table 4: Top Early Industry/Occupation Combinations

	Entire Sample	Low-Skilled	Medium-Skilled	High-Skilled
Retail Food / Food Service	8.8%	9.5%	9.0%	7.6%
Manufacturing / Operative	8.3%	10.9%	8.3%	6.2%
Ag, Forestry, Mining, or Construction / Laborer	4.8%	6.7%	4.7%	3.0%
Finance, Insurance, Real Estate, or Business / Other Clerical	4.1%	3.3%	4.6%	3.2%
Professional Service other than Health / Non-Business Professional	3.9%	2.3%	2.8%	7.8%
Other Retail / Business Professional	3.9%	2.7%	4.0%	4.9%

Repair, Personal, or Recreation Service / Low- Skilled Service other than Food	3.8%	5.3%	3.8%	2.3%
Health / Low-Skilled Service other than Food	3.3%	4.1%	3.2%	2.6%
Ag, Forestry, Mining, or Construction / Craftsman or Mechanic	3.3%	3.4%	3.4%	3.0%
Retail Food / Secretary, Cashier, or Clerk	2.2%	2.9%	2.4%	1.2%

While there are similarities and differences in the early lines of work held by the three skill groups, the next step is to examine the relationships between a worker's early line of work and his/her long run economic outcomes. It is possible that these relationships will also vary by skill group. Since Retail Food/Food Service is one of the most common lines of work, Retail Food is the excluded industry category and Food Service is the excluded occupation category. These are also good baseline categories because the "dead end" label is often attributed to low-skilled service sector jobs such as waitress or deli-worker.

An additional binary variable, "Unclassified" indicates those workers who failed to have a dominant early industry or occupation or to be working at the end of the early (5-year) period.

Wage Estimation Results – Early Industry and Occupation

Table 5 shows the results of the weekly and hourly Heckman wage estimations for the sample as a whole. Block χ^2 tests are performed on the Early Industry and Occupation identifiers to examine statistical significance of the relationship between early line of work and long run wages. In both the weekly and hourly wage estimations for the entire sample, the block of early industry identifiers and the block of early occupation identifiers are statistically significant at the 1 percent level.

Table 5: Heckman Wage Estimations with Early Industry and Occupation

		Entire Sample		Less-Skilled		Medium-Skilled		High-Skilled	
		Number of Observations 5917		Number of Observations 1497		Number of Observations 2956		Number of Observations 1464	
		Censored Observations 1313		Censored Observations 521		Censored Observations 586		Censored Observations 206	
		Uncensored Observations 4604		Uncensored Observations 976		Uncensored Observations 2370		Uncensored Observations 1258	
		Ln of 1998 Weekly Wage	Ln of 1998 Hourly Wage	Ln of 1998 Weekly Wage	Ln of 1998 Hourly Wage	Ln of 1998 Weekly Wage	Ln of 1998 Hourly Wage	Ln of 1998 Weekly Wage	Ln of 1998 Hourly Wage
Early Industries: Excluding Retail Food	Agriculture, Forestry, Mining, & Construction	-0.0066 (0.0414)	0.0060 (0.0322)	0.0610 (0.0848)	0.0707 (0.0647)	-0.0561 (0.0546)	-0.0300 (0.0436)	0.0280 (0.0912)	0.0407 (0.0704)
	Manufacturing	0.0355 (0.0371)	0.0472 (0.0288)	-0.0383 (0.0812)	-0.0375 (0.0620)	0.0471 (0.0495)	0.0761 (0.0395)	0.0715 (0.0782)	0.0618 (0.0599)
	Transportation, Comm., Utilities & Wholesale Trade	0.0803 (0.0473)	0.0927** (0.0368)	0.0591 (0.1070)	0.0717 (0.0818)	0.1097 (0.0623)	0.1127** (0.0497)	0.0586 (0.0971)	0.0773 (0.0744)
	Other Retail	0.0159 (0.0387)	-0.0300 (0.0300)	-0.0794 (0.0864)	-0.0948 (0.0662)	0.0774 (0.0500)	0.0215 (0.0399)	-0.0155 (0.0830)	-0.0594 (0.0635)
	Finance, Insurance, Real Estate, Business	-0.0108 (0.0422)	0.0326 (0.0328)	-0.1899 (0.0979)	-0.1581** (0.0747)	-0.0214 (0.0558)	0.0475 (0.0445)	0.1056 (0.0862)	0.1347** (0.0662)
	Repair, Personal, & Recreation Services	-0.1038** (0.0427)	-0.0690** (0.0331)	-0.2826* (0.0872)	-0.1712* (0.0657)	-0.0450 (0.0553)	-0.0101 (0.0441)	-0.1008 (0.0998)	-0.1061 (0.0765)
	Health	-0.0776 (0.0458)	0.0029 (0.0354)	-0.2232** (0.0968)	-0.0357 (0.0731)	-0.0295 (0.0614)	-0.0013 (0.0490)	-0.0385 (0.0956)	0.0408 (0.0722)
	Professional Services other than Health	0.0033 (0.0410)	-0.0117 (0.0318)	-0.1087 (0.0851)	-0.1183 (0.0643)	0.0749 (0.0567)	0.0719 (0.0452)	0.0040 (0.0843)	-0.0304 (0.0643)

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Public Administration	0.0750 (0.0525)	0.0747 (0.0408)	-0.0433 (0.1072)	-0.0268 (0.0821)	0.0608 (0.0721)	0.1012 (0.0575)	0.2260** (0.1069)	0.1364 (0.0822)
Non-Business Professionals	0.1882* (0.0426)	0.1597* (0.0330)	0.2527* (0.0937)	0.2214* (0.0710)	0.1644* (0.0584)	0.1311* (0.0467)	0.1094 (0.0887)	0.1437** (0.0671)
Business Professional	0.0278 (0.0428)	0.0922* (0.0332)	0.0439 (0.1041)	0.1231 (0.0791)	0.0253 (0.0557)	0.0767 (0.0445)	-0.0803 (0.0920)	0.0464 (0.0700)
Secretaries, Cashiers, Clerks	-0.1169* (0.0423)	-0.0384 (0.0327)	-0.0375 (0.0849)	-0.0235 (0.0643)	-0.1226** (0.0551)	-0.0392 (0.0440)	-0.2412** (0.0981)	-0.0830 (0.0745)
Other Clerical	-0.0663 (0.0405)	-0.0081 (0.0313)	0.0252 (0.0855)	0.0331 (0.0644)	-0.0828 (0.0536)	-0.0226 (0.0427)	-0.1216 (0.0879)	-0.0156 (0.0666)
Craftsmen, Mechanics	-0.0231 (0.0451)	-0.0066 (0.0350)	0.0276 (0.0920)	0.0162 (0.0700)	-0.0466 (0.0599)	-0.0378 (0.0478)	-0.0468 (0.0993)	0.0271 (0.0752)
Operatives	-0.1168* (0.0407)	-0.0884* (0.0315)	-0.1091 (0.0839)	-0.0416 (0.0639)	-0.1231** (0.0536)	-0.1146* (0.0428)	-0.1353 (0.0908)	-0.0725 (0.0690)
Laborers	-0.0861** (0.0409)	-0.0746** (0.0316)	-0.0856 (0.0766)	-0.0665 (0.0583)	-0.0135 (0.0540)	-0.0546 (0.0431)	-0.3012* (0.0994)	-0.1483 (0.0759)
Low-Skilled Services other than Food	-0.1022** (0.0425)	-0.0841* (0.0327)	-0.0524 (0.0814)	-0.0482 (0.0611)	-0.0363 (0.0565)	-0.0665 (0.0451)	-0.3394* (0.0990)	-0.1799** (0.0749)

Looking at all respondents (in Table 5), early work experience in the industries of Transportation, Communications, Utilities, and Wholesale Trade is significantly superior to working in Retail Food for long run hourly wages. The same is true, but to a lesser extent, for long run weekly wages. Working in Public Administration early in one's career also improves long run hourly wages over Retail Food employment, although this impact is only significant at the 10% level. Early experience in Repair, Personal, or Recreation Services significantly reduces long run weekly and hourly wages, compared to early industry experience in Retail Food. Working in the Health industry is also nearly significant in reducing a worker's long run weekly wages, compared to Retail Food.

Compared to early work in a Food Service occupation, being employed as an Operator, Laborer, or non-food Low-Skilled Service worker is significantly worse for long run wages while early work as a Non-Business Professional is significantly better for long run wages. Early experience in a Business Professional occupation also significantly improves long run hourly wages over early Food Service experience. Working as a Secretary, Cashier, or Clerk is also significantly worse for long run weekly wages than early work in Food Service.

Skill Group Differences

When respondents are divided into skill groups, Heckman wage estimations again reveal a statistically significant relationship between early line of work and long run wages. The block χ^2 tests reveal that Early Industry and Occupation are significant predictors of long run weekly and hourly wages for low, medium, and high-skilled workers. In every case but one, these variable blocks are statistically significant at the 1 or 5 percent level. The only exception to this is the case of the high-skilled weekly wage estimation, where the Early Industry identifiers are statistically insignificant.

To know if it is justifiable to split respondents into skill groups, it is useful to see if the relationships between early line of work and long run wages differ by skill level. To answer this, skill group dummies are interacted with each regressor. For example, this creates an education variable for each skill group where the low-skilled education variable contains values for respondents in AFQT Quartile 1 but is assigned zeroes for all other respondents. I then test the equality of the coefficients across skill groups. The null hypothesis is that the coefficient on the low-skilled Manufacturing indicator, for example, equals the coefficient on the medium and high-skilled Manufacturing indicators. This process reveals that there are statistically significant differences between skill groups in the way in which early industry and occupation relates to long run wages, especially weekly wages.

Table 5 presents regression results for each of the three skill groups. It reveals that, as with the sample as a whole, less-skilled workers with early industry experience in Repair, Personal, and Recreation Services are significantly worse off than their peers with early Retail Food experience. Early experience in the Health industry also significantly reduces long run weekly wages for the less-skilled while early experience in Finance, Insurance, and Real Estate reduces their long run hourly wages and is nearly significant in reducing their long run weekly wages. Similarly, early experience in non-Health Professional Service industries is nearly significant in reducing long run hourly wages for the less-skilled. No early industry category provides significantly higher wages for the less-skilled than Retail Food.

In terms of early occupation experience, Professional Non-Business occupational employment is superior to Food Service for the long run weekly and hourly wages of the less-skilled. No other occupational categories are significantly different from early Food Service for the low-skilled group. While the Unclassified variable is statistically insignificant in every

estimation, this indicator is negative and nearly significant for low-skilled long run hourly wages. This means that a low-skilled worker is better off having early experience in Retail Food/Food Service than if they have no dominant early line of work and are not working in their fifth year out of school.

For the medium-skilled group, no early industry experience is significantly worse than Retail Food. On the other hand, medium-skilled workers with early industry experience in Manufacturing, Transportation, Communications, Utilities, Wholesale Trade, or Public Administration are better off than those with experience in Retail Food in terms of long run hourly wages. Early experience in a Transportation, Communications, Utilities, or Wholesale Trade industry is also somewhat superior to Retail Food experience for long run weekly wages of the medium-skilled.

As with low-skilled workers, medium-skilled workers benefit more from early experience as a Non-Business Professional than they do from early Food Service experience. Business Professional experience is also somewhat superior to Food Service experience for medium-skilled workers when it comes to their long run hourly wages. On the other hand, medium-skilled workers are better off with early Food Service experience than with early work as an Operative or as a Secretary, Cashier, or Clerk.

For high-skilled workers, early industry experience in Public Administration is superior to Retail Food experience. Early industry experience in Finance, Insurance, Real Estate, or Business is also related to higher hourly wages for the high-skilled compared to Retail Food experience. No other industry significantly differs from Retail Food. High-skilled workers with early occupational experience as Non-Business Professionals earn higher hourly wages than their peers with Food Service experience, all else equal. There are a number of early occupations,

however, that lead to lower long run weekly wages than Food Service occupations. These include Secretaries, Cashiers, Clerks, Laborers, and Less-Skilled Services (other than food). While early experience in all of these occupational groups is also negatively related to long run hourly wages, only those with early experience in non-Food Less-Skilled Services have significantly different long run hourly wages than high-skilled workers with early Food Service experience.

Gender Differences in Long Run Wages – With Early Industry and Occupation

It seems appropriate, especially when looking at lines of work, to examine possible gender differences. Table 6 displays the industry/occupation affiliation by gender and skill group for the most populated lines of work taken from the sample as a whole (from Table 4). The industry/occupation combinations show the similarities in early work experiences between males and females, especially for low and medium-skilled workers. Only in the Retail Food/Food Service combination does the male and female representation differ by more than two percent. Low-skilled females are more likely to have early experience in this line of work than their male counterparts while medium-skilled males are better represented in this category than their female peers. In one-third of these male-female comparisons there is a difference in representation of more than one percent and most of those cases relate to high-skilled workers.

There is a gender difference in the number of “Unclassified” respondents. Recall that a respondent is labeled as Unclassified if they meet two conditions: (1) the worker does not have a dominant early line of work, and (2) he/she is unemployed or out of the labor force at the end of the early period (i.e., in the fifth year out of school). It is not surprising that females are more likely to be Unclassified since they are more likely than men to be out of the labor force.

Table 6: Top Early Industry/Occupation Combinations –By Gender & Skill Group

	Low-Skilled		Medium-Skilled		High-Skilled	
	Female s	Male s	Females	Males	Females	Male s
Retail Food / Food Service	10.9%	8.3%	7.7%	10.5%	7.7%	7.5%
Manufacturing / Operative	11.9%	10.0 %	8.1%	8.5%	6.9%	5.6%
Ag, Forestry, Mining, or Construction / Laborer	7.3%	6.3%	5.2%	4.2%	3.3%	2.8%
Finance, Insurance, Real Estate, or Business / Other Clerical	4.1%	2.6%	4.9%	4.2%	2.5%	3.9%
Professional Service other than Health / Non-Business Professional	2.0%	2.5%	2.1%	3.6%	8.7%	7.0%
Other Retail / Business Professional	2.5%	2.8%	4.2%	3.8%	4.3%	5.4%
Repair, Personal, or Recreation Service / Low- Skilled Service other than Food	5.1%	5.5%	3.5%	4.0%	2.1%	2.5%
Health / Low-Skilled Service other than Food	4.5%	3.8%	3.2%	3.2%	2.0%	3.1%
Ag, Forestry, Mining, or Construction / Craftsman or Mechanic	3.8%	3.1%	3.2%	3.6%	3.5%	2.5%
Retail Food / Secretary, Cashier, or Clerk	2.8%	3.0%	2.4%	2.3%	1.0%	1.4%

To test for gender differences in the relationship between early line of work and long run wages a set of variables is created to interact gender and the other regressors. For each skill group, tests are then conducted to test the equality of the male and female early industry and occupation coefficients. These tests reveal that there are no statistically significant gender differences in the coefficients associated with early line of work. While it is possible that there are differences in the impact of early line of work on wages between males and females overall, a gender difference does not emerge inside of each skill group.

Long Run Wage Predictions for Early Industry/Occupation Combinations

The results show that there are very few differences in the way that early industry and occupation experiences impact the long run wages for males and females. The results also reveal, however, that a worker's early line of work does matter to that worker's long run wages and the impact of his/her early industry and occupation experience can depend on the worker's skill level.

Drawing from the coefficients in the Heckman wage estimations for each skill group, Table 7 displays the long run wage consequences of early work in Retail Food/Food Service versus the other top industry/occupation combinations. Wage predictions are made for an average worker in each skill group who alternatively is assumed to have experience in each of the top early industry/occupation combinations (other than Retail Food/Food Service). These predicted wages are then compared to the predicted wage for an identical worker who instead has early experience in Retail Food/Food Service. The percentage difference between the wages is then calculated. The results are shown only for weekly wage as the hourly wage results are very similar.

Focusing largely on the industry/occupation combinations most important for the less-skilled, a key comparison is the one between Retail Food/Food Service and the most prevalent non-service oriented line of work, Manufacturing/Operative. The table reveals that workers in all skill groups have lower long-run wages if they have early experience as a Manufacturing/Operative, but low-skilled workers lose the most, almost 14 percent of 1998 weekly wages. Another important comparison is with service-oriented lines of work other than Retail Food/Food Service. The calculations show that, regardless of the industry it is paired with, the non-food Low-Skilled Service occupations are related to substantially lower wages with low-skilled workers losing between 24 and 28 percent of their 1998 weekly

wages. Medium-skilled workers lose much less, between 6 and 8 percent, while high-skilled workers lose the most, between 31 and 36 percent, for having early experience in these low-skilled service occupations.

Early experience in the Ag, Forestry, Mining or Construction/Laborer combination has drastically different consequences, depending on the worker's skill level. Relative to Retail Food/Food Service work, low-skilled workers lose very little in 1998 weekly wages if they have early work experience in the Ag.../Laborer combination, while high-skilled workers lose nearly one-quarter of their long run weekly wages. An almost identical pattern exists for early experience as a Secretary, Cashier or Clerk in Retail Food. This type of early experience is nearly the same as Retail Food/Food Service experience for the low-skilled but high-skilled workers lose over one-fifth of their wages.

Two of the nine combinations listed are superior to Retail Food/Food Service for the low-skilled group. Early experience as a Non-Business Professional in a Non-Health Professional Service industry is beneficial for all workers, relative to Retail Food/Food Service experience. On the other hand, only low-skilled workers benefit from early experience as a Craftsman or Mechanic in an Ag, Forestry, Mining, or Construction industry.

Table 7: Impact of Early Industry/ Occupation on 1998 Weekly Wage

Note: All numbers are percentage differences in long run weekly wage relative to the wage predicted for early employment in Retail Food/Food Service.

	Low-Skilled	Medium-Skilled	High-Skilled
Retail Food / Food Service	Predicted Weekly Wage: \$409.92	Predicted Weekly Wage: \$454.66	Predicted Weekly Wage: \$556.55
Manufacturing / Operative	-13.7%	-7.3%	-6.2%
Ag, Forestry, Mining, or Construction / Laborer	-2.4%	-6.7%	-23.9%
Finance, Insurance, Real Estate, or Business / Other Clerical	-15.2%	-9.9%	-1.6%
Professional Service other than Health / Non-Business Professional	15.5%	27.0%	12.0%
Other Retail / Business Professional	-3.5%	10.8%	-9.1%
Repair, Personal, or Recreation Service / Low-Skilled Service other than Food	-28.5%	-7.8%	-35.6%

Health / Low-Skilled Service other than Food	-24.1%	-6.4%	-31.5%
Ag, Forestry, Mining, or Construction / Craftsman or Mechanic	9.3%	-9.8%	-1.9%
Retail Food / Secretary, Cashier, or Clerk	-3.7%	-11.5%	-21.4%

If a “dead-end job” is defined as a line of work that leads to lower long run wages than other lines of work, all else equal, then the results from Table 7 can be used to differentiate “dead-ends” from “stepping stones”. It would appear that, for the low-skilled, Retail Food/Food Service ranks somewhere in the middle of the spectrum. Early experiences in the Agriculture, Forestry, Mining or Construction industries combined with Laborer and Craftsman or Mechanic occupations appear to be better stepping stones for the average low-skilled worker. The Professional Service other than Health/Non-Business Professional combination also appears to be a better stepping stone than Retail Food/Food service experience. On the other hand, early experience as a Manufacturing/Operative or in any non-food Low-Skilled Service occupation appears to be a more “dead-end” situation than that of Retail Food/Food Service. A few of these early lines of work appear to have similar long run consequences for low-skilled workers as Retail Food/Food Service experience (Ag, Forestry, Mining, or Construction/Laborer; Other Retail/Business Professional; Retail Food/Secretary, Cashier, or Clerk).

Few studies have attempted to address the impact of early line of work. As previously discussed, one study (Gardecki and Neumark 1998) included a variable in the long run wage estimations that indicated whether the worker’s first job is in a service-producing industry and found that this variable was not statistically significant. It is difficult to compare this result with the findings here since the authors only included the single variable, but the results in Table 7 indicate there can be long run penalties to service-producing lines of work, especially for low-

skilled workers. The results also show, however, that service-oriented work is not always the most harmful to worker's long run wages. Low-skilled workers with early experience as manufacturing operators, for example, fare worse in the long run than those with early experience as service workers in retail food.

Conclusions

This study investigates the importance of the line of work a person has most experience with early in their work history. If jobs can have varying investment opportunities for human capital growth, then early line of work is likely to have a long run impact on worker wages. Early industry and occupation identifiers are therefore included in Heckman estimations of long-run weekly and hourly wages. Results show that these early line of work identifiers are statistically significant in predicting long-run worker wages. Further, there are significant differences in this relationship (between early line of work and long run wages) based on the worker skill level. Females and males, however, seem to be impacted similarly by early line of work. Overall, this research provides evidence that early line of work matters to a worker's long run outcomes and it provides some justification for labeling lines of work as "dead-ends" or "stepping-stones".

Additional research could support these findings and could also improve on the categorization of industries and occupations used here. A data set with a larger number of observations could refine the categories to make them even more detailed.

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Appendix

Table A.1: Variable Descriptions

	<i>Dependent Variables</i>
Ln(Weekly Wage) in 1998	The weekly wage is the respondent's hourly wage multiplied by the usual number of hours per week reported for the respondent's main job (most hours) at the time of the 1998 interview.
Ln(Hourly Wage) in 1998	The hourly wage is the one reported for the respondent's main job (most hours) at the time of the 1998 interview.
	Personal Characteristics
Age in 1998	Respondents are between 33 and 41 in 1998.
Bad Health	Percent of years that the respondent reported bad health from 1979 to 1998.
Education	Highest grade completed by the respondent as of the 1998 interview.
AFQT Score	Aptitude test taken in 1980, standardized according to the respondent's age.
Hispanic	Respondent reports that he/she is Hispanic.
Black	Respondent reports that he/she is Black.
Female	Respondent is female.
Married in 1998	Married at the time of the 1998 interview.
Children	Number of children, biological and non-biological.
South in 1998	Living in the South in 1998.
SMSA in 1998	Living in an SMSA in 1998.
Rural in 1998	Living in a rural area in 1998 (population in the county 0-49% urban).
	Job Characteristics
Union in 1998	Union member in main job (job with most hours).
1998 Industry Broad Categories	Identifies which of 4 industry broad categories the respondent's main job belongs to at the time of the 1998 interview. (Non-Service, Professional Services, Retail Services, Commercial Services)
1998 Occupational Broad Categories	Identifies which of 5 occupation broad categories the respondent's main job belongs to at the time of the 1998 interview. (Trades, Low-skilled Business, High-skilled Business, Low-skilled Services, and Professional Services)

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	Experience
Total Experience (months)	Amount of time the respondent has worked in all jobs over working life. Total hours worked are divided by 160 to convert to approximate full-time equivalent months of experience.
	<i>Tenure</i>
Job Tenure (months)	Length of time worked for current main employer. Weeks of tenure are divided by 4 to convert weeks into approximate months of tenure.
Industry Tenure	Length of time worked for the industry category associated with current main employer. Defined through the matching of industry categories over time where 0 signifies 0 to 2 years; 2 signifies 2 to 4 years; then 5, 6, 7, up to 19 years.
Occupation Tenure	Length of time worked for the occupation category associated with current main employer. Defined through the matching of occupational categories over time, exactly as Industry Tenure is.
	<i>Mobility</i>
Early Jobs	Number of unique employers the respondent worked for the first five years that he/she reported not attending school.
Late Jobs	Number of unique employers the respondent worked for from the sixth year that he/she reported not attending school and on through 1998.
Early Industries	Number of unique industry categories the respondent worked in the first five years he/she reported not attending school.
Late Industries	Number of unique industry categories the respondent worked in starting with the sixth year he/she reported not attending school and on through 1998.
Early Occupations	Number of unique occupation categories the respondent worked in the first five years he/she reported not attending school.
Late Occupations	Number of unique occupation categories the respondent worked in starting with the sixth year he/she reported not attending school and on through 1998.
Late Involuntary Moves	Number of times the respondent left a job because of being fired, laid off, program termination, or plant closing - from the sixth year that he/she reported not attending school and on through 1998.
	<i>Early Line of Work</i>
Early Industry Categories	Identifies which of 10 industry categories the respondent worked in most in the first five years he/she reported not attending school. If the worker had no dominant early industry then this variable indicates which industry the respondent was working in at the end of the five year "early" period.
Early Occupation Categories	Identifies which of 9 occupation categories the respondent worked in most in the first five years he/she reported not attending school. If the worker had no dominant early occupation then this variable indicates which

	occupation the respondent was working in at the end of the five year “early” period.
Unclassified	Indicates if the respondent had no dominant early industry/occupation and was not employed at the end of the five year “early” period.

Table A.2: Wage Sample Restrictions

	1998 Respondents	8399	Observations Remaining
Enrolled in/attending school in 1998		-378	8021
In the military in 1998		-85	7936
Not living in the U.S. in 1998		-79	7857
Wage/Hour Irregularities:			
No jobs reported but current wage reported		-5	7852
Worked less than 12 hours per week and hourly wage exceeds \$132		-8	7844
Hourly wage is less than \$2		-71	7773
Either hourly or weekly wage (or both) not reported when respondent is not out of the labor force or unemployed		-798	6975
Missing data for one or more regressors (other than Early Industry and Occupation)		-739	6236
Missing data for Early Industry and Occupation		-319	5917