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Abstract

We test whether employment growth of male worker's initial industry influences earnings growth using the 1979 National Longitudinal Survey of Youth. We follow workers for 20 years after reporting their first industry finding that lower employment growth in initial industry implies substantially lower earnings growth. Notably, after controlling for observable skills, controls for family background and region have no impact on estimates. Effects appear larger for initial occupations that involve more routine or manual tasks, as well as for occupations that involve less abstract tasks, but these differences are not statistically significant.

Key Words: Industry, Earnings Growth, Employment Growth, Early Life Choices, Routine Tasks

JEL Codes: J2, J3, O3

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Industries have long been characterized by differences in wages (Dickens and Katz 1986, 1987; Krueger and Summers 1988). Over time, industries involving routine tasks have also seen significant changes in labor demand (Autor, Levy and Murnane 2003). Further research has documented long-run earnings impacts of the circumstances when workers first enter the labor market including effects of entering during a recession (Åslund and Rooth 2007; Kahn 2010; Liu, Salvanes and Sørensen 2016; Oreopoulos, Von Wachter and Heisz 2012; Oyer 2006, 2008; Raaum and Røed 2006; Schwandt and von Wachter 2017, 2019), starting employment at a larger firm (Arellano-Bover 2019; Muller and Neubaeumer 2018), and working at higher paying firms.

In this study, we test whether employment growth of the worker's initial industry influences future earnings. Job displacements have long lasting impacts on earnings (Burgess, Propper, Rees, and Shearer 2003; Couch and Placzek 2010; Jacobson, LaLonde, and Sullivan 1993). On the other hand, Gardecki and Neumark (1998) and von Wachter and Bender (2006) find that early job losses have at most modest and short-lived effects on earnings. We examine the earnings growth of male workers using the 1979 National Longitudinal Survey of Youth. We follow workers for 20 years after they have entered the labor market and selected an initial industry controlling for detailed measures of practical skills, cognitive ability, non-cognitive skills and family background.

Respondents selecting an initial industry that has lower employment growth experience substantially lower earnings growth. Notably, after controlling for observable skills and attributes, the inclusion of controls for family background and region has no impact on the estimates. A one standard deviation increase in employment growth is associated with 9 percent of a standard

deviation increase in earnings over the same 20 year period. These results arise regardless of whether the individual left the industry early (before 5 years). Effects appear larger for occupations within the initial industries that involve more routine or manual tasks, as well as for occupations that involve less abstract tasks, but these differences are not statistically significant.

I. Methodology and Data

The covariate of interest is a measure of making a "favorable" initial industry choice versus an "unfavorable" one. We use the growth rate of employment in the individual's initial industry (over 20 years from entry) as a proxy for a favorable choice. The employment growth rate provides a measure of the overall demand for workers within that industry, and also a sense of the performance of the industry over time. To calculate the growth in the initial industry, we use industry employment data from the Current Employment Statistics (CES) program of the Bureau of Labor Statistics.

The individual sample comes from the 1979 National Longitudinal Survey of Youth. The NLSY79 cohort includes respondents who were aged between 14 and 22 years during their first survey in 1979, with data available up to 2014. In this analysis, we restrict our attention to only male workers, who are not initially employed in the agricultural sector or in the armed forces. To obtain our analysis sample, we first follow individuals over time to observe the year in which they declare full-time employment (30 hours per week), which we define as their entry year. However, some employed individuals do not report an industry especially in their early years in the labor market. In order to maximize sample, we include all individuals in our sample who declare an industry of employment within 7 years of first reporting full-time employment. Accordingly, we base a worker's initial industry entry year as the first year in which they report an industry of employment following their initial report of full time employment in the labor market.

Earnings growth is then calculated from the first year that an individual reports being employed in a specific industry. We base earnings growth on three-survey moving averages of earnings around their initial industry choice year and then 20 years later in order to have the potential of at least three years of earnings data for each average, and we remove those survey years in which earnings are either reported as zero or earnings are not reported for any of the years included in the moving average. The earnings data are deflated by the consumer price index for each year and thus our outcomes correspond to growth in real earnings 20 years from entry into the industry.

We include a wide array of controls including individual demographics, variables capturing human capital and additional background variables. The model includes controls for total years of schooling, dummies for whether or not the individual has a high-school degree, a college degree, some college education, the individual components of the Armed Services Vocational Aptitude Battery (ASVAB) and finally controls for non-cognitive or social skills including the Rosenberg self-esteem score and the Rotter Locus of Control score (both standardized), self-reported sociability and participation in clubs (Deming 2017). We also include controls for family background including parental education and family income. If the youth is living with his/her parents or guardian at the time of the first survey, family income is set to zero and a dummy variable for family income not available is included in the model and interacted with the parental education variables in order to allow those variables to be more important when family income is not observed. Further, family income excludes the earnings of the youth themselves in the first survey because our dependent variable is based on the youth's current or future earnings.

II. Results

Table 1 below shows the results of the main analysis, where the dependent variable is the growth in average (real) earnings over 20 years. Column (1) shows the estimate of the relationship without any controls except for the age in Wave 1 of the NLSY 97 by industry entry-year fixed effects; column (2) adds all the demographic, education, cognitive and non-cognitive skills and ability (individual) controls to the regression, column (3) further adds the family background controls and initial region fixed effects. Standard errors are clustered by initial industry.

We find a positive and significant relationship between the growth in an individual's earnings and the growth in the initial industry of employment. While the inclusion of individual controls substantially reduces the estimates consistent with positive selection into industries that will experience future employment growth, additional controls for family background or region do not erode the estimates. Notably, variables like family income and parental education that are typically thought to influence or at least be highly correlated with long term economic success have minimal ability to explain our estimated effects after conditioning on detailed measures of individual skills and ability. In terms of magnitudes, the estimate in column (3) suggests that a one standard deviation increase in the initial industry employment growth is associated with a 0.092 standard deviation increase in the individual's earnings growth over 20 years.

We next conduct two robustness tests related to our definition of initial industry. Our initial sample was based on all individuals who declare an initial industry within 7 years of starting full-time employment. However, one might argue that the initial industry should be considered as that which the individual reports being in, almost immediately after entering the labor market. Therefore, we restrict our sample to only those individuals who declared an industry within 2 years of starting full-time employment. We also identify an individual's initial industry based on the first

industry reported after the individual has completed/left school. The results are robust in terms of both significance and magnitude.

We also conduct a simple falsification or placebo test where we examine whether future employment growth in the initial industry can predict past earnings growth. Specifically, we test for a relationship between an individual's earnings over the first 10 years after entry into the industry and the future employment growth of this industry employment, i.e., growth between 10 and 20 years after industry entry. Our hypothesis is that an individual's earnings in the first 10 years from entry into the industry should have no significant association with any industry growth taking place after those 10 years, since those years have not taken place yet. Table 2 presents these results and the estimates are statistically insignificant and modest in magnitude.

Next, we split our sample along several key dimensions to examine heterogeneity in the effects of initial industry choice. For example, in a world where industry specific human capital is important, the "choice" of the industry may be less important compared to the "length of stay" within the industry. Thus, we split our sample into those who left the initial industry within 4 years of entry, and those who persisted for at least 5 years. Table 3 presents these results. The estimates are larger for the subsample where the worker persisted in the industry, but we cannot reject the null hypothesis that the two estimates are the same and the estimated effect for the subsample that did not persist in the industry is statistically significant.

Finally, in Table 4, we split the samples based on the task content of the workers' occupation within their initial industry dividing the occupations into above and below median on share of tasks involving abstract content, routine activities, and manual labor, e.g. Autor et al. (2003), Acemoglu and Autor (2011) and Autor & Dorn (2013). We obtain substantially larger point estimates for the subsamples involving above median routine and manual tasks and below

median abstract tasks, but we lack precision to claim with confidence that effects are larger for such occupations. We find similar results when splitting the sample based on a measure of offshorability (Baumgarten et al., 2013).

III. Conclusions

This paper presents an empirical analysis of the relationship between a critical labor market choice or outcome of individuals early in their career, initial industry, and their long-term growth in earnings. We find that making the choice of entering into a "good" or favorable industry, i.e., an industry which after the fact experienced high employment growth over time, leads to a significantly positive influence on a worker's long-term earnings growth.

In order to control for the pre-labor market endowment that each individual possesses, we control for important individual and family background characteristics which may impact individual earnings including a variety of measures of cognitive and non-cognitive ability, for any age effects, year of entry effects, any effects from the region of residence during entry into the industry. While controls for skills and ability erode our estimates, controls for important family background variables have minimal impact on our estimates after conditioning on individual measures of ability and skills. Our findings are also robust to several checks changing the way we identify an initial industry and finding very similar results. Finally, we conduct a placebo test to assess the validity of the analysis showing that employment growth between years 10 and 20 has no impact on earnings growth during the first 10 years after initial industry choice.

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Table 1: Growth in earnings 20 years after industry entry

Growth (log) average. Earnings	(1)	(2)	(3)
Growth industry employment	0.404	0.254	0.248
	(0.0929)	(0.0702)	(0.0708)
Observations	3,319	3,319	3,319
R-squared	0.156	0.328	0.342
Age at Wave 1 x Entry-Year FE	YES	YES	YES
Demographic + human Capital		YES	YES
Family background			YES
Initial Region FE			YES

Notes: OLS estimates of growth in log earnings on growth in initial industry employment. Column 2 adds controls for individual attributes including cognitive and non-cognitive skills. Column 3 adds controls for family background including family income and parental education. Standard errors clustered at the industry level are shown in parentheses.
Source: Authors

Table 2: Growth in earnings over 10 years on future emp. growth

Growth (log) average earnings	(1)	(2)
Employment. growth next 10 years	0.00130	-0.111
	(0.127)	(0.124)
Observations	4,308	4,308
R-squared	0.085	0.341
Age at Wave 1 x Entry-Year FE	YES	YES
Demographic + human capital		YES
Family background		YES
Initial Region FE		YES

Notes: OLS estimates of growth in log earnings on future growth in initial industry employment (after the period of earnings growth). Column 2 adds controls for individual attributes, family background and initial region. Standard errors clustered at the industry level are shown in parentheses.
Source: Authors

Table 3: Explaining growth in earnings by worker persistence in industry

Growth in (log) average earnings	(1) Worker persisted at least 5 years	(2) Worker did not persist for 5 years
Growth in industry employment	0.350	0.206
	(0.0945)	(0.0737)
Observations	836	2,483
R-squared	0.405	0.352
Age at Wave 1 x Entry-Year FE	YES	YES
Demographic + human capital	YES	YES
Family background	YES	YES
Initial Region FE	YES	YES

Notes: OLS estimates of growth in log earnings on growth in initial industry employment. Column 1 presents results for a subsample of workers who persisted in the industry for at least five years, and column 2 presents results for a subsample of workers who did not persist for five years. Standard errors clustered at the industry level are shown in parentheses.
Source: Authors

Table 4: Explaining growth in earnings by tasks in initial occupation

Panel A	Above Median Task Share		
Growth in (log) earnings	Abstract	Routine	Manual
Growth in employment	0.155	0.244	0.351
	(0.129)	(0.0905)	(0.105)
Observations	1,657	1,610	1,506
R-squared	0.404	0.352	0.413
Panel B	Below Median Task Share		
Growth in (log) earnings	Abstract	Routine	Manual
Growth in employment	0.328	0.148	0.163
	(0.0661)	(0.0952)	(0.0928)
Observations	1,662	1,709	1,813
R-squared	0.354	0.389	0.346
Age x Entry-Year FE	YES	YES	YES
Demo./human capital	YES	YES	YES
Family background	YES	YES	YES
Initial Region FE	YES	YES	YES

Notes: OLS estimates of growth in log earnings on growth in initial industry employment. Columns 1, 2 and 3 present results for subsamples of workers based on share of tasks in initial occupation that are abstract, routine or manual, respectively. Panel 1 presents estimates for above median share occupations and panel 2 presents estimates for below median share. Standard errors clustered at the industry level are shown in parentheses.
Source: Authors