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Early Career Experiences and Later Career Outcomes: Comparing the United States, France, and Germany

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Summary

This paper explores the links between individuals' early career experiences and their labor market outcomes 5 to 20 years later using data from France, (western) Germany, and the United States.[1] Relative to most of the literature, we consider a large set of measures of men's early career experiences and later career outcomes. Our results differ significantly across countries. Labor market outcomes in Germany are consistent with a dual labor market model. In the case of American workers, either the market learns about unobservable worker characteristics over time or the implicit contracts established at the start of the career are increasingly renegotiated over time. Unobserved heterogeneity in individuals' networks of labor market contacts is consistent with our results for France. These results reflect optimal firm responses to the different institutional environments in each country in the presence of ex ante imperfect information concerning young workers.

1. Introduction

This paper attempts to untangle the theoretically complicated and empirically uncertain links between the early labor market experiences of young people and their labor market success or failure later in life. Although the subject of early career experiences, such as "excessive" job mobility or taking a long time to find a first job, has already been treated in the literature, very little attention has been given to more long-term effects (at least five years after leaving school).[2] With some notable exceptions, the empirical literature concentrating on youth tends to ignore the distinction between the immediate post-schooling period and later periods, while the literature that looks specifically at the immediate post-schooling period is typically limited to a relatively short three- to five-year time horizon.[3] Most researchers focus on a limited set of early career experiences. Furthermore, labor market success or failure is often characterized by a unique "output" measure, log hourly wages in studies based on data from the United States or a measure of employability in studies based on European data.

In this paper, we use a large set of measures of early career experiences of young men and consider all of these measures *simultaneously* during the estimation in an attempt to control for the omitted variable bias that plagues the interpretation of many previous results. Our analysis also considers a much longer time span than most previous research (5 to 20 years after leaving school) and a variety of different measures of later career success. We estimate models using panel data techniques to control for time-invariant unobserved individual heterogeneity that is not captured by our regressors. Finally, we use data from three different countries: the United States, France and (western) Germany.[4]

The rest of the paper is organized as follows. Section 2 summarizes the theoretical foundations underlying our approach. Section 3 briefly describes the three datasets involved in this research, and Section 4 discusses the econometric techniques used. Section 5 presents a summary of our results. Finally, section 6 concludes.

2. Theoretical Explanations of the Link between early and later Career Events

The literature in labor economics has much to say about why early career experiences should be related to later career success. The literature can be broken down into five main strands: information-based learning models, sorting models, human capital models, contracting models and unobserved productive heterogeneity.[5] The *information-based learning models* maintain that, since information is not symmetric and complete in the labor market, agents will learn about unknown characteristics over time. One implication is that the significance of early career experiences in determining later career outcomes should decrease over time. On the other hand, as information is revealed about the worker in *sorting models*, the market assigns him or her to the appropriate job. These models suggest that the importance of early career experiences on later career outcomes does not diminish, and may even grow over time. One variant of these models is often called the *dual labor market* model.

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1 This paper is a summary and substantially shortened version of Margolis, Simonnet and Vilhuber (1999).

2 See, e.g,. Topel and Ward (1992) for the United States.

3 Keith and McWilliams (1995), Ruhm (1995) and Gardecki and Neumark (1998) are three papers that explicitly consider the long-term effects of youth experiences. See Margolis, Simonnet, and Vilhuber (1999) for a discussion of the differences between those papers and ours.

4 Space constraints limit the discussion of the underlying theory, construction of the data, sample selection criteria, and institutional explanations of our results. We also present results only for men. A more complete exposition can be found in Margolis, Simonnet, and Vilhuber (1999).

5 See Margolis, Simonnet, and Vilhuber (1999).

In a typical *human capital* model, workers invest in productive capacity at the start of their careers and may add to their initial investments over time. These investments are typically rewarded through higher wages. Some variants of these models allow workers' old knowledge to become outdated. Other work has proposed that human capital may be semi-specific to the firm (of lower, yet positive value, to at least some firms other than the current employer), occupation-specific (of equal value to all employers provided that the worker performs the same occupation as with the current employer), or sector-specific (of equal value to all firms in the same sector as the current employer).[6] The empirical implications of this type of model depend on the assumptions adopted. In the sector specific approach, fewer different sectors for a given number of days worked implies the accumulation of more human capital in any given sector. In models where human capital does not depreciate over time, the significance of these effects should remain constant. In models where human capital depreciates, the capital garnered at the beginning of a career becomes less and less relevant over time, and thus measures of it should become less and less significant.

Contracting models are based on the idea that firms and workers agree on the conditions and requirements of the job, and the associated remuneration, at the start of employment. Contracts are related to the conditions that prevail at that time. Contract renegotiation models suggest that, if outside options are stochastic, the probability that the contract will be renegotiated increases with time. A renegotiated contract will reflect conditions at the time of the renegotiation, and early career variables should be less relevant. Thus, one should see a decrease in the importance of the early career variables over time, similar to the learning models described earlier.

Finally, in models with *individual-specific*, time-invariant *heterogeneity* correlated with worker productivity, individuals with more valuable characteristics will earn more, find employment more easily, and stay employed longer than their counterparts with less valuable characteristics. Because these characteristics are time-invariant or persistent, individuals who were more successful early will also tend to be more successful later in their careers, ceteris paribus.

An important feature of these latter models is that the unobserved characteristics may be correlated with observable characteristics, and the failure to control for them (typically through panel data techniques) will tend to induce an omitted variable bias in the estimators of the coefficients of the observable variables in the model. Because of this phenomenon, and the inherent unobservability of the relevant characteristics, these models are often evoked as residual explanations. However, these models suggest that we can interpret differences in relationships between early career variables and later career outcomes that are estimated with and without controlling for unobserved individual heterogeneity as representing the omitted variable bias in the estimates induced via correlation of the observable covariates with the unobservable heterogeneity.

3. Data Description

The data for the United States were drawn from the National Longitudinal Survey of Youth (NLSY), the data for France from the Annual Social Data Declarations (Déclarations annuelles de données sociales, or DADS) and the data for (western) Germany from the German Socio-Economic Panel (GSOEP). The GSOEP and NLSY are survey-based data sources, while the DADS data were drawn from administrative records. Our data consists of long panels (at least ten years) of labor market histories that follow men after they leave school. Considerable attention has been devoted to harmonizing variable definitions and data structures. An observation is defined to be an individual in a particular year. All individuals were followed from the date they left school, and all time variables were measured in years or fractions of years. The first two years following leaving school served as the base period for the measure of the following early career variables: number of employers, share of time spent in employment, average job duration, number of different occupations and number of different industries. We also calculated growth in annual labor earnings between the first and second post-schooling years and included an indicator variable for the absence of labor earnings during the first post-schooling year.[7] Finally, we measured the time until the first job (in years) and the additional time necessary to find a job lasting at least six months.

In addition to the analysis variables, we also attempted to harmonize our specifications in terms of other control variables. In particular, we typically control for education and entry cohort (in the set of time-invariant variables) and nonlinear functions of age and job seniority, number of years since school leaving, sector and occupation in the set of time-variant variables, measured contemporaneously with the outcome measure.[8]

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[6] See Vilhuber (1997, 1999) for tests of the industry-specific interpretation.

[7] For individuals without first year earnings, growth in annual earnings was coded as zero, which is equivalent to interacting a latent earnings growth measure with 1 minus the indicator variable for the presence of first year earnings.

[8] Not all variables are available for all countries. The French data contain no information on hours worked. The German panel data do not allow for computation of the number of industries and number of occupations an individual experienced in the first two post-school years in the labor market. The United States and German data also provide more demographic information on individuals than the French data. These data provide additional control variables. Table 1 in Margolis, Simonnet, and Vilhuber (1999) provides descriptive statistics.

4. Econometric Specifications

Our econometric analysis relied on the sequential estimation of three different specifications of the base model. We estimated an ordinary least squares specification with a time-invariant relationship between the early career measures and the later career outcomes (the most typical specification in the literature; a similar specification that allows for the presence of individual-specific fixed effects, which may be correlated with the model regressors (called uninteracted fixed effects below), and a specification with potentially correlated individual fixed effects and early career variables whose effect on outcomes can vary nonparametrically with time since leaving school (called interacted fixed effects below). Our dependent variables include log real hourly wages, log real monthly earnings, and the latent share of the year spent in employment.

The base specification can be expressed as follows:

$$w_{it} = f(x_i, \beta_1) + y_i\beta_2 + z_{it}\beta_3 + \mu_{it} \quad (1)$$

where w_{it} is the relevant dependent variable, x_i is the set of early career variables of interest, y_i is the set of remaining time-invariant variables, z_{it} is the set of time-varying covariates, and is an unobserved component of the dependent variable, which consists of (at least) a statistical residual as well as an individual heterogeneity that, depending on the specification, can be correlated with the other model regressors.[9] The function $f(x_i, \beta_1)$ captures the effect of the early career variables. Both $f(x_i, \beta_1)$ and μ_{it} vary across specifications.

In the case of *OLS*, $f(x_i, \beta_1) = x_i\beta_1$ and $\mu_{it} = \varepsilon_{it}$, where ε_{it} is assumed to be an i.i.d. residual. The residual function becomes $\mu_{it} = \alpha_i + \varepsilon_{it}$ in both the uninteracted and interacted fixed effects specification, where α_i represents unobserved individual heterogeneity that is correlated with the dependent variable. The uninteracted fixed effect specification retains the same $f(x_i, \beta_1)$ as *OLS* but, in the interacted fixed effects model, $f(x_i, \beta_1) = \sum_{j \in T_i} 1_{t=j}\, x_i\beta_{1,(j-s_i)}$, i.e., the x_i variables are interacted with (time-varying) indicator variables $1_{t=j}$ denoting time since leaving school. The variable s_i refers to the year in which individual i left school. In this specification, we do not have a single β_1, but rather a set of coefficients $\beta_{1,5}$, $\beta_{1,6}$, …, $\beta_{1,\max}$ for each post-schooling year considered, from five to max, where max varies according to the maximum panel length in the country.[10]

In the uninteracted fixed effect specifications, under the assumption that is orthogonal to the time-invariant variables ($E(\alpha x) = 0$ and $E(\alpha y) = 0$), we can use a two-step estimator to recover unbiased estimates of β_1 and β_2. In the first step, we estimate Equation (1) in differences from individual-specific means, obtaining $\hat{\beta}_3$. We then calculate

$$\sum_{t \in T_i} \left(w_{it} - z_{it}\hat{\beta}_3 \right) \Big/ \sum_{t \in T_i} 1 = \hat{u}_i ,$$

where T_i represents the set of dates for which we observe data on individual i, $E(\hat{u}_i) = x_i\beta_1 + y_i\beta_2 + \alpha_i$, and $\mathrm{var}(\hat{u}) = \mathrm{var}\left(w_{it} - z_{it}\hat{\beta}_3 \,|\, t \in T_i \right) \Big/ \sum_{t \in T_i} 1$. The weighted least squares regression

$$\hat{u}_i = x_i\beta_1 + y_i\beta_2 + \alpha_i , \quad (2)$$

with $1/\mathrm{var}(\hat{u}_i)$ as the weight, allows us to recover unbiased estimates of β_1 and β_2.

The first step of the interacted fixed effects model yields estimates of the vector β_1. Those estimates allow us to evaluate the trend in the relationship between the early career variables and the later career outcomes while allowing this trend to be correlated with unobserved individual heterogeneity.[11] This method does not, however, allow us to recover the level of this effect. In order to interpret level effects, we combine the results from the uninteracted fixed effect model with those of the interacted fixed effect model. We can interpret the results of the uninteracted fixed effects model as providing information on the mean of the later career effects, for which the trend can be estimated from the interacted fixed effects model.[12] For example, a positive coefficient in the uninteracted model, combined with a negative trend, would imply an early career variable that has a positive, but diminishing, effect on later career outcomes.

5. Results

Table 1 presents the results of estimating the OLS specification on our United States, French, and German data, and Table 2 presents the results of our uninteracted fixed effects estimation. Due to space constraints, results from the interacted fixed effect specification are not reported here.[13]

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[9] The model for the percentage of time spent in employment is estimated as a tobit model, bounded above by 1 and below by 0.

[10] The coefficients $\beta_{1,5}$, $\beta_{1,6}$, …, $\beta_{1,\max}$ are identified by normalizing $\beta_{1,5} = 0$.

[11] We recover the trend in the relation between an early career variable and an outcome through a secondary WLS regression, in which we regress the point estimates of the coefficients on the number of years since leaving school (excluding five years since leaving school) and an intercept, weighting by the inverse of the estimated variance of the coefficient. Since we use point estimates as dependent variables, any given coefficient estimate may not be significantly different from zero but we may still be able to discern a significant trend in the point estimates.

[12] This interpretation is only strictly correct econometrically under the additional assumption that $E(\alpha x) = 0$ in the interacted fixed effects model.

[13] Those results are available upon request. Those coefficient estimates are only occasionally individually significant, but given

The coefficient estimates vary greatly across countries, even when estimated in a consistent manner across countries. This finding implies that none of the theoretical models we consider universally applies to all three countries. We interpret this variation as evidence that institutions matter. In this section, we draw on both tables published here and the results from the interacted fixed effects model, and for each country we point out patterns that emerge from the results in all three tables. We find that the theoretical models most consistent with the largest sets of significant coefficients are as follows.

Germany

Labor market outcomes in (western) Germany are consistent with a dual labor market model for men. We find that taking extra time to find a long job is associated with lower monthly earnings and a lower subsequent employment rate (Tables 1 and 2). Furthermore, absence of first-year earnings is associated with significantly lower later career earnings and lower later career employment probabilities (Table 1). In addition, it seems that having had many different employers early in a German man's career (for a given amount of time spent employed) is negatively related to the probability that he will be observed in employment later in life. Finally, not only were German men penalized, on average, for having taken extra time to find a stable job and for having had many different employers at the start of the career, but the results for the interacted fixed effects model also indicate that these penalties increase over time.

These results are most consistent with a dual labor market model, in which the primary sector offers stable (long) jobs and good wage growth prospects while the secondary sector provides the opposite.[14] In such a model, persons trapped in the secondary labor market take a long time to find a stable job. The length of time spent finding a job thus signals whether one is in the primary or secondary sector. This signal should be related to lower earnings (through fewer hours, lower wages or both). Furthermore, since jobs in this sector are unstable, a man who takes at least six months to find his first job should face a lower instantaneous employment probability, and thereby spend a smaller share of the year employed.

In Germany, the dual labor market distinction is likely to correspond to successful versus unsuccessful studies and apprenticeships. In this event, the successful student finds his or her first job quickly (often with the apprenticeship employer). A man who takes longer to find his first job is more likely to work in the secondary sector (c.f. Winkelmann 1996). Because successful students are more likely to stay with their apprenticeship employer, they are also more likely to have fewer different employers (for a given amount of time spent employed) during the first two years of labor market activity. Conversely, frequent job changes at the start of a career may indicate unsuccessful pre-labor market experiences for which a worker appears to be penalized later in life.[15] This association may reflect true underlying productivity differences, but in the context of the dual labor market model, the signal attached to frequent job changes is that these workers are confined to the secondary sector.

France

The results for Germany's geographical neighbor are strikingly different. They are consistent with a model in which there is unobserved heterogeneity in the networks of labor market contacts available to different people, in a market that learns slowly or not at all.

Such a model predicts that individuals with better networks find new jobs faster, initially as well as when they lose their old jobs, leading to a higher expected number of employers for a given amount of time spent working.[16] Higher quality networks mean that an individual is more likely to be employed in the future as well, since his or her unemployment spells will tend to be shorter. This implication is supported by the positive correlation between the number of employers and later career employment probabilities in Table 1. Moreover, this model predicts that a good set of connections will lead the individual to find his or her first job more rapidly, a prediction that is supported by opposite signs on the coefficients time to first job and number of employers in Table 1. This is particularly evident in the sign of the coefficient on the nonlinearity term for men in the employment probability model in that table.

In a model with unobserved worker heterogeneity, workers with good networks will be less likely to settle for the first job they find. Good networks of labor market contacts are likely to imply higher job offer arrival rates, and (possibly) draws from a better wage offer distribution. Consequently, on-the-job search is more profitable and, ceteris paribus, workers with good networks take longer to settle into a "stable" job at the start of the career. Finally, if high quality networks lead not only to more jobs but also to better jobs, then earnings should be higher. Consistent with

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that we are considering the point estimates (albeit weighted by the precision of their estimation) we often find significant t-statistics associated with the slope coefficients.

[14] Other models, such as insider-outsider models and queuing/screening models, have similar implications to the dual labor market model outlined here. See Margolis (1996) for a model based on underlying worker heterogeneity that generates an equilibrium nondegenerate distribution of jobs with different returns to seniority and different separation rates. In addition, many efficiency wage models predict the existence of an "ocean" of small firms where employment is readily available at a fixed wage, as compared to other firms that offer seniority returns profiles.

[15] Simonnet (1997) finds a similar earnings penalty for instability in Germany.

[16] Simonnet (1996) found similar results using a different French data set.

Table 1

Least Squares and Tobit Models Pooling All Later Observations

	Log Real Hourly Wage		Log Real Monthly Earnings			Share of Time Spent in Employment		
	United States	Germany	United States	France	Germany	United States	France	Germany
Time to First Job	0.020 (0.052)	–0.015 (0.016)	0.011 (0.054)	–0.028 (0.008)	–0.009 (0.013)	–0.041* (0.013)	0.163* (0.015)	–0.045 (0.148)
Additional Time to First Job of at Least 6 Months	–0.006 (0.019)	–0.043 (0.107)	–0.016 (0.020)	0.016 (0.007)	09.043* (0.022)	–0.023* (0.004)	0.171* (0.013)	–0.294 (0.211)
Number of Employers in First 2 Years	0.003 (0.012)	–0.029 0.041	0.002 (0.012)	0.004 (0.001)	0.001 (0.027)	–0.004 (0.003)	0.162* (0.004)	–0.759* (0.375)
Share of Time Spent in Employment in First 2 Years	0.156* (0.073)	0.107 (0.112)	0.153* (0.076)	–0.029 (0.026)	0.129 (0.091)	0.097* (0.017)	-0,461* (0.059)	1,402 (1.145)
Average Job Duration During First 2 Years	0.168 (0.143)	–0.006 (0.005)	0.158 (0.149)	0.021 (0.032)	–0.006 (0.004)	–0.034 (0.034)	0.681* (0.071)	–0.066 (0.048)
Indicator for First Year Earnings Unavailable ($1_{[w1=0]}$)	–0.061 (0.068)	–0.089* (0.029)	–0.063 (0.071)	0.028 (0.018)	–0.068* (0.024)	0.031* (0.015)	–0.076* (0.037)	–0.122 (0.260)
Earnings Growth $((w_2-w_1)/w_1)*1_{[w1>0]}$	–0.023 (0.015)	–0.022 (0.008)	–0.024 (0.016)	–0.001* (0.000)	–0.010 (0.007)	–0.002 (0.004)	–0.002* (0.000)	0.079 (0.091)
Number of Different Occupations in First 2 Years	–0.014 (0.015)		–0.007 (0.016)	0.031* (0.006)		–0.007‡ (0.004)	–0.070* (0.015)	
Number of Different Industries in First 2 Years	–0.005 (0.016)		–0.012 (0.017)	–0.038* (0.008)		–0.003 (0.004)	–0.137* (0.017)	
Adjusted R^2 or Log Likelihood	0.2535	0.3631	.3349	0.3224	0.4360	581.22	–51572.46	–1310.43
Number of Observations	5,323	2,271	5,323	48,457	2,347	6,754	58,902	2,119

Notes: A "*" denotes significance at the 5% level, a "‡" significance at the 10% level.
Notes for Log Real Hourly Wage and Log Real Monthly Earnings. Least squares standard errors in all regressions are corrected for arbitrary heteroskedasticity.
US: Regressions control for log hours, years of education, age, age2, seniority, seniorty2, rural residency, nonwhite, married, 7 entry cohorts, 6 post-insertion years, 4 regions, 12 sectors and 9 occupations.
FR: Regressions control for 8 educational categories, age, age2, age3, age4, seniority, seniorty2, Paris region, 8 entry cohorts, 16 post-schooling years, 8 sectors and 6 occupations.
DE: Regressions control for 9 educational categories plus years of education, age, age2, age3, age4, seniority, seniorty2, 8 entry cohorts, 9 years, marital status, 4 firm sizes and 3 occupations.
Notes for Share of Time Spent in Employment. Tobit of percentage of time employed bounded above by 1 and below by 0.
US: Regressions control for years of education, age, age2, rural residency, nonwhite, married, 7 entry cohorts, 6 post-insertion years, 4 regions.
FR: Regressions control for 8 educational categories, age, age2, age3, age4, Paris region, 8 entry cohorts and 16 post-schooling years.
DE: Regressions control for 9 educational categories plus years of education, age, age2, age3, age4, 8 entry cohorts, 9 years and marital status.

Sources: United States — NLSY and author's calculations; France — DADS and author's calculations; Germany — GSOEP and author's calculations.

Table 2

Uninteracted Fixed-Effect Models — Second (Between) Stage Decomposition of the Estimated Fixed Effect

	Log Real Hourly Wage		Log Real Monthly Earnings		
	United States	**Germany**	**United States**	**France**	**Germany**
Time to First Job	0.052 (0.060)	–0.018 (0.025)	0.048 (0.062)	–0.064* (0.012)	–0.033 (0.023)
Additional Time to First Job of at Least 6 Months	0.007 (0.020)	–0.062‡ (0.032)	–0.001 (0.021)	–0.013 (0.010)	–0.065 (0.040)
Number of Employers in First 2 Years	0.023‡ (0.012)	–0.038 (0.058)	0.027* (0.012)	0.000 (0.002)	–0.018 (0.065)
Share of Time Spent in Employment in First 2 Years	0.091* (0.081)	0.180 (0.176)	0.203* (0.085)	–0.135* (0.041)	0.113 (0.198)
Average Job Duration During First 2 Years	0.133 (0.153)	–0.008 (0.007)	0.125 (0.161)	–0.069 (0.050)	–0.007 (0.008)
Indicator for First Year Earnings Unavailable ($1_{[w1=0]}$)	0.040 (0.092)	–0.172* (0.039)	0.043 (0.090)	0.023 (0.027)	–0.111* (0.049)
Earnings Growth $((w_2\text{-}w_1)/w_1)*1_{[w1>0]}$	–0.036* (0.004)	–0.010 (0.014)	–0.030* (0.012)	–0.001* (0.000)	0.019 (0.016)
Number of Different Occupations in First 2 Years	–0.020 (0.017)		0.012 (0.018)	0.034* (0.010)	
Number of Different Industries in First 2 Years	0.001 (0.017)		–0.003 (0.018)	–0.015 (0.012)	
Adjusted R^2	0.0314	0.1252	0.033	0.1513	0.1845
Number of Observations: First (Within) Stage	5,427	2,579	5,427	48,457	2,666
Number of Observations: Second (Between) Stage	1,224	480	1,224	5,657	483

Notes: All within (first stage) regressions are performed on data differenced from individual-specific means. Table presents results of regressing the estimated fixed effect on early career variables, weighted by the inverse of the standard error of the estimated individual fixed effect. A "*" denotes significance at the 5% level, a "‡" significance at the 10% level.
US: Within-regressions control for log hours, years of education, age, age2, seniority, seniorty2, rural residency, married, 6 post-insertion years, 4 regions, 12 sectors and 9 occupations. Other control variables in the between regression include race and 9 entry cohorts.
FR: Within regressions control for age, age2, age3, age4, seniority, seniority2, Paris region, 16 post-schooling years, 8 sectors and 6 occupations. Other control variables in the between regression include 8 education categories and 8 entry cohorts.
DE: Within regressions control for age, age2, age3, age4, seniority, seniorty2, 9 years, marital status, 4 firm sizes and 3 occupations. Other control variables in the between regression include 9 educational categories plus years of education and 8 entry cohorts.

Sources: United States - NLSY and author's calculations; France - DADS and autho'r' calculations; Germany - GSOEP and author's calculations.

these implications, we find in Table 1 that individuals who take longer to find their first jobs (low-quality networks) tend to have lower earnings later in their careers. However, conditional on the time to first job, a man who took longer to find his first *stable* job is less likely to be out of employment later in his career, and has *higher* earnings.[17] However, this latter point estimate disappears once individual heterogeneity has been controlled for in Table 2, suggesting the importance of such heterogeneity.

However, our results suggest that pure heterogeneity in offer arrival rates is not a sufficient explanation for the workings of the French labor market. Individuals who have a given number of employers spread across a larger number of sectors tend to do worse later in life, both in terms of earnings and employment prospects. This result is not consistent with undifferentiated heterogeneity in job offer arrival rates. It is, however, consistent with a model of localized networks, where an individual's contacts tend to be found in similar types of jobs.

United States

Our results for the United States labor market are consistent with two alternative (observationally equivalent) theories. Either the market learns about unobservable worker characteristics over time or implicit contracts are established at the start of the career and are increasingly renegotiated over time. In both of these models, early career experiences play a decreasingly important role in determining later career outcomes.

Our results are consistent with both a model that assumes heterogeneity across workers in each worker's degree of employability and a model of heterogeneity in reservation wages. Neither of these explanations, however, is consistent with more than a few of the estimated coefficients, and none provides a single theoretical framework to understand the full pattern of coefficients.

On the other hand, the results from our interacted fixed effects specifications provide a coherent framework for evaluating the importance of these multiple justifications. For all but three (out of nine) effects, the sign of the trend coefficient is the opposite of the signs of (at least one of) the static coefficients.[18] For example, a positive static coefficient coupled with a negative trend in the interacted coefficients implies an average effect over the early career that is positive, but is tending to fade away with time. As laid out in Section 2, this is consistent with both an information-based learning model as well as with a model of contract renegotiation.

6. Conclusion

We have considered the effects of a large variety of measures of early career experiences on later career outcomes using data drawn from three different countries. As suggested in the introduction and in section 2, there are many different theories that link our early career variables to our later career outcomes. Given the complexity of the underlying behavior, estimation of very simplified models is likely to lead to misleading interpretations of resulting coefficient estimates.

Our results have shown that the subject is, indeed, highly complex. There appears to be no single theoretical model that is capable of explaining the pattern of signs on any given coefficient in any given specification across all three countries. Nevertheless, we can find theoretical explanations that are consistent with the results for each country taken separately. The German labor market seems to function in a manner consistent with dual labor market theory. The French labor market behaves as if there is heterogeneity in each person's network of labor market contacts. Finally, the United States labor market seems to either demonstrate that firm managers learn about workers' unobserved productive characteristics or that implicit (or explicit) employment contracts are more frequently renegotiated over time.

Despite the observation that each country's labor market seems to function differently, there seems to be a common underlying foundation for the different systems that reflects the efficiency of each country's educational system. As we point out in Margolis, Simonnet and Vilhuber (1999), the educational and apprenticeship system in Germany provides useful signals for men, and firms solve their constrained optimization problem by concentrating primarily on the information rendered through education and training. In France, the early tracking and separation of individuals into technical or professional versus generalist curricula allows for the formation of tight networks of similarly trained workers on one hand, and a diffuse set of non-specialists on the other. The heterogeneity in the quality of education in the United States means that firms may not be able to rely upon the signal derived from education, so they find it optimal to invest in learning about the productive capacities of their employees, while employees are able to exploit the fluid nature of the labor market to their advantage in renegotiating their contracts as this (previously hidden) information becomes available.

The main conclusion one can draw from this analysis is that firms attempt to distinguish between workers with dif-

[17] This is the case for our model, which uses monthly earnings as the dependent variable, although the coefficient in the employment probability model is harder to explain.

[18] The variables *number of employers*, *average job duration,* and *number of occupations* have coefficients whose sign is the same as the sign of the trend in their evolution. Of these, only a small number of employers has a significant coefficient in both the static and interacted models.

ferent productive abilities, and as a result they need information about new entrants. When the educational and training system provides this information, firms exploit it directly and do not necessarily gather more information about each individual's productive characteristics. When the educational system does not provide this information, however, the market discriminates between workers on the basis of whatever information it has available at the start of an individual's career. Firms, however, seek to add to this information in order to refine their prior opinions about the productive capacities of each individual as time goes on.

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