

Does a Four-Fold Higher Unemployment Rate Make a Difference?
Wage Growth and Job Mobility of Young Workers in France, Germany, and
the United States

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Abstract

Young French workers enter the labor force facing unemployment rates that are four times as high as in Germany. However, despite their low initial labor force attachment young French workers do not appear to experience slower rates of wage growth than young Germans. While in contradiction with standard models of on-the-job experience accumulation, these patterns could be explained by the prevalence of job search and matching. The paper uses large representative micro data sets to examine the hypothesis that similar rates of wage growth derive from job search in France and on-the-job human capital accumulation in Germany. Both detailed evidence on the incidence and benefits of job mobility and on the return to actual work experience support this hypothesis. France is more similar to the U.S. as the flexible benchmark than to Germany in terms of incidence and gains of job mobility. Consistent with these patterns, panel estimates show little returns from actual time worked for young workers in France and significantly positive returns in Germany. However, job mobility in Germany is more prevalent and important than a simple human capital model would imply, suggesting search is an important source of growth for all three countries.

JEL-Codes: J21, J24, J64

Keywords: unemployment, job mobility, experience, job search, young workers

EALE Theme: Occupational Choice and Mobility (J24, J44, J62)

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1. Introduction

Young workers in France and Germany face very different initial conditions in the labor market. Young French workers experience unemployment rates of up to 25% upon entering the labor market. On the other hand, their German counterparts have unemployment rates little higher than that for mature workers – about 7%. By the late 20s, however, these differences have vanished. Among others, the high rates of unemployment in France imply a considerable loss in time spent working. A canonical model of experience accumulation in the spirit of Mincer (1974) would imply that French workers have slower rates of wage growth, since they lack the opportunity to make human capital investments on the job. However, wage growth rates in France and Germany are similar. From a human capital point of view it is a puzzle that (at least at the aggregate level) French workers do not seem to suffer medium or long term consequences from high initial unemployment. On the other hand, matching models imply that high unemployment and job turnover could be a sign of beneficial job search.

The hypothesis examined in the present paper then is that France and Germany follow two different systems of school-to-work transition. In France, young workers spend a higher fraction of their time searching for the right job match. This implies higher rates of job mobility, higher unemployment rates, and a more important role of job changes in wage growth than in Germany. If this is the case, the role of job mobility and search in France would be similar to the United States as documented by Topel and Ward (1992). In Germany workers are sorted into occupations at the end of schooling and accumulate experience on the job. Job stability is high even after the end of apprenticeship training and mobility plays a lower role for wage growth.

The paper analyzes these implications using large representative cross-sectional and panel datasets from France and Germany. The focus is first, on documenting the evolution of unemployment, labor force attachment, and wage-growth with labor market experience. Second, on the analysis of job mobility and its relative importance for wage growth across countries. Third, on the role of actual experience for wage growth as measured by time spent working in the French data. The U.S. is included throughout the analysis as benchmark for a ‘flexible’ labor market.

Preliminary results suggest that the rates of job mobility differ across countries as predicted by the simple hypothesis. Young French workers are more mobile between jobs than young Germans and are similar to American workers. Wage growth between jobs is almost as important in France as in the U.S., again consistent with an important role of job search in both countries. Similarly, job growth matters less in Germany than in France or the US. However, it appears that German workers' wages still grow substantially at job changes. Taken together with non-negligible rates of early job mobility, this suggests that beneficial job search appears to be a similarly important phenomenon in all three countries considered. Thus, French workers only partially compensate the loss in labor market experience with higher gains from job search. This is consistent with the similarity in aggregate growth rates if actual labor market experience is not crucial for early wage growth. Data on actual time-use available in the French and German data allows us to assess this implication directly. As suggested by the basic hypothesis, actual time worked has a small and insignificant impact on wage growth in France and a positive significant effect in Germany.

The next section gives a brief overview of the implications of the main theories of the role of labor market experience and discusses the institutional environment. Section 3 provides descriptive evidence on early labor market conditions in France and in Germany. Section 4 compares the extent of mobility between jobs across countries. Section 5 analyzes the role of job mobility for wage growth, while Section 6 provides evidence on the extent and effect of actual time spent working. The last section concludes.

2. Possible Sources of Wage and Job Mobility of Young French and German Workers

2.1. Theories of the Wage-Experience Profile

Basic models of wage growth do not give unambiguous predictions regarding the determinants of training and the role of job mobility. In the basic human capital model by Mincer (1974) and Becker (1964), workers pay for general training they receive on the job by accepting wages lower than their marginal product. Since investments are most profitable early in a worker's career, the model predicts an increasing and concave wage-experience profile. Those who invest in

experience accumulation on the job receive initially a lower wage, and then eventually overtake those who do not invest. The variance of earnings should decline before and rise after the ‘overtaking age’ (Mincer 1974). In the basic human capital model, job mobility neither hurts nor benefits workers. However, the amount of on-the-job human capital investment is proportional to the time spent working, and thus persistent or repeated unemployment could reduce wage growth.

On the other hand, theories of job matching and job search predict that mobility has a positive effect on wage growth. As workers sequentially search among jobs of different quality and move if they find a better offer than the current job, their wages grow at a decreasing rate as they exhaust the set of possible improvements (Burdett 1978). Search models thus predict concave wage experience profiles as well. Moreover, the model predicts a declining rate of job mobility, and declining gains from job changes, as well as increasing job losses with experience.¹

A recent literature suggests that by ignoring a systematic role for job mobility the standard model cannot explain core stylized facts of the youth labor market. Manning (2002) forcefully argues that simple search models have the potential to address important inconsistencies of the standard model in explaining wage growth. Topel and Ward (1992) show that job mobility of young American men is high, systematic, and beneficial. This stands in contrast to a strand of literature arguing that high job mobility is potentially costly. For example, the rate of job loss among young workers is high (Farber 1997) and they lose most in recessions (Blanchflower and Oswald 1994). While wage declines from job losses appear only to be temporary (von Wachter and Bender 2004), it appears that young workers’ labor force attachment is initially tenuous. Based on the human capital model it is often argued that this instability prevents young workers from accumulating beneficial work-experience (see, e.g., Ryan 2001).

Little direct evidence is available on the mechanisms of experience accumulation proposed by Mincer (1974). This is partly because the empirical challenges are daunting – even if a direct

¹ A partial synthesis between matching and training models is attempted by Acemoglu and Pischke (1998), who argue that firms are willing to pay for general training if adverse selection in the labor market reduces young workers’ job options. This restriction to job mobility allows them to earn rents on the trained workers. On the other hand, anything increasing workers’ mobility reduces training. Thus, the model has two equilibriums: one with high turnover and low training and the other with low turnover and high training. A variant of the model has the interesting implication that minimum wages can raise training, the opposite prediction as from standard human capital theory.

measure of experience such as hours worked were available, numerous factors such as selection, endogeneity, and omitted variable bias would distort simple estimators. An early paper by Hause (1980) shows how within a large group of homogeneous Swedish males initial wages are negatively correlated to wage growth as a model of investment would predict. Another line of research has tried to directly estimate the returns to work experience using observed or imputed actual experience measures.² However, while the literature on firm-specific human capital has worried extensively about possible confounding factors, few of the papers on general human capital accumulation do (e.g., Topel 1991, Altonji and Williams 1997).

Similar problems also limit the analysis of the causal effect of job mobility on wage growth. Since the early empirical studies of Mincer and Jovanovic (1982) and Bartel and Borjas (1981), Topel and Ward (1992) have extensively documented the patterns of job mobility among younger workers. They show that a third of wage growth of the first ten years in the labor market occurs at job changes. A growing literature documenting a vast amount of job and worker reallocation in the U.S. is strongly consistent with an important role of job search for older workers as well. However, few studies try to address issue of causality (Manning 2002) or try to distinguish search from sequential sorting of workers to firms (Gibbons, Katz, Lemieux, and Parent 2002).³ Nevertheless, search and matching has become a widespread tool to model labor market dynamics that coexists in parallel to the classic human capital model. Although for example Topel and Ward (1992) attempt to provide a synthesis, a thorough empirical comparison of the role of job search and on-the-job human capital accumulation for young workers' careers stands out.⁴

² The empirical literature on the role of experience in explaining the difference in male and female wages has tried to address some of these problems. The literature uses either direct measures of actual experience (e.g., Light and Ureta 1997, Blau and Kahn 1997), or imputes experience based on personal characteristics (e.g., Garvey and Reimers 1979, 1980, Filer 1993) or at the group level (e.g., Myck and Paull 2001). Although some of the authors try to address the confounding factors with two-stage least squares estimates (e.g., Mincer and Polachek 1974), identification in most of these models is based on strong exclusion restrictions (Neumark and Korenman 1994). While little is known on the degree of omitted variable bias, a larger literature provides evidence on the potential role of selection due to participation decisions (e.g., Blundell et al. 2003).

³ However, the large literature on the returns to job tenure is complementary to the role of job mobility. Positive returns to tenure would have to be reconciled with wage increases at job changes, an issue further addressed below.

⁴ Models of careers within firms can also imply persistence of early labor market conditions. For example, models based on uncertainty and risk aversion (Harris and Holmstrom 1988), on long-term implicit contracting (e.g., Salop and Salop 1979, Lazear 1979) suggest workers' bargaining power might be limited if unemployment is high (Beaudry and DiNardo

While job mobility has generally been found to be lower in European countries, little systematic comparative evidence exists for young workers. The existing evidence suggests that young workers are generally more mobile than older workers (Ryan 2001). Cohen et al. (1997) argue that both accession and separation rates for French workers are lower in the U.S. at all ages. However, they also document that relative to older workers young French workers are more mobile. Similarly, while older Germans are in very stable jobs, young Germans finishing the apprenticeship system experience high rates of job mobility (Euwals and Winkelmann 1999) and appear to benefit from voluntary mobility (von Wachter and Bender 2004).

The present paper aims at providing some systematic evidence on the role of job mobility for wage growth among young workers in France, Germany, and the US. The classic paradigms thereby provide some straightforward hypotheses. If job search is more important in France than in Germany, it should be that mobility rates are higher and possibly more similar to that of the US. Similarly, job mobility should matter more for wage growth in France and the US than for young German workers. While incidence should be higher, the duration of spells spent working, in unemployment, or out of the labor force should be shorter in France. On the other hand, the actual time spent working should not have a strong role for wage growth in France.

2.2. German and French Labor Market Institutions

While the fundamental economic mechanisms of human capital accumulation and search are probably present in both countries, their effects are likely to be shaped by institutional differences present in the youth labor market. Young French and German workers indeed face different institutional environments when exiting secondary school. These differences imply that the timing of school exit and of stable labor market entry differs in the two countries, something our empirical analysis has to address. However, a closer look at the main features of the German and French education systems and labor markets for young workers also reveals some common features that will be helpful in interpreting our results.

1992). Models of internal labor markets or stepping stone human capital accumulation (e.g., Gibbons and Waldman 2002) suggest the supply of career jobs varies over time.

Almost two thirds of young Germans start an apprenticeship at the end of secondary education, most commonly after nine or ten years of schooling. Apprenticeships last two to three years, and involve formal schooling as well as formal and informal training on the job. We will discuss in detail below how we treat apprenticeships when creating a years of schooling measure comparable to the U.S. During apprenticeships, wages are significantly lower than market wages for similar workers. After apprenticeship training, a small fraction of these workers goes on to become specialized technicians or attends two-year colleges. Workers who stay in school 13 years to obtain a high-school degree either obtain apprenticeship training or go on to university, which can take up to six or seven years.

Three noteworthy features of the German system are first, that there is no statutory minimum wage applying to all workers. Instead, employer associations and unions bargain regional industry-level pay scales that only apply to the respective members of the associations. Apprentice wages are bargained over separately, and apprentice contracts are by nature fixed term, i.e., firms do not face a commitment to employ trainees at the end of training. Second, German men have to attend compulsory military or civil service for ten months after turning 18. Most young men enter military service at the end of apprenticeship or high school, between ages 19 and 21. Third, since Germany has a partial compulsory schooling age until age 18, even those who exit school after 9th or 10th grade usually attend some form of vocational training or partial schooling.

No large scale apprenticeship system exists in France. Instead, after nine years of compulsory schooling (commonly until age 15), French youths can choose between upper level secondary schooling and a variety of vocational schools. This leads to a higher variety of educational degrees in France⁵ and, as further discussed below, to a larger fraction of workers without any vocational training than in Germany. Some of the apprenticeship and vocational schemes have been introduced as active labor market policies to reduce youth unemployment. Currently, the fraction of young French workers that is employed on fixed term contracts by age is only slightly lower to that in Germany when apprentices are counted. Fixed term contracts are 6 to 24 months and are thus

⁵ Lauer (2001) contains a detailed discussion and comparison of French and German education systems.

shorter than the average apprenticeship, which lasts three years. Military service in France has been gradually abolished since 1996; before, most young French men attended military service after turning 18 or finishing secondary schooling. In contrast to the German system, France has a national minimum wage (the SMIC). Although there is little evidence on the extent to which the minimum wage is binding for young workers, Ryan (2001) concludes that the minimum wage has potential to affect youth employment in France. However, consistent with the US literature, estimates of the elasticity of youth employment with respect to the minimum wage are very low (Abowd et al. 2000).

Labor market entry in both France and Germany occurs through the wide spread use of explicit fixed term contracts. As shown below, this induces common patterns in the labor market entry that distinguish both countries from the U.S. However, German fixed term contracts entail lower wages, an explicit training guarantee, and a higher retention rate at the end of training, features that will be helpful in understanding some of the differences we address. For the present analysis, these differences also imply that French workers will finish formal education and enter fixed term contracts earlier than their German counterparts. This will be a recurring pattern in the age-gradients we discuss, and will provide insights into the role of institutions on job mobility. To control for differential changes in the educational composition we discuss education groups separately; we analyze the evolution of careers by potential labor market experience; or we control for educational attainment directly.

3. Unemployment and Wage-Growth

3.1. Data

The evidence in this paper is based on several nationally representative micro-data sets that allow us to measure young workers' employment outcomes for separate age and education levels. For France the data are drawn from the Enquête Emploi, collected by INSEE. The Enquête Emploi consists of yearly labor force survey that covers 1/300 of the French population and has a rotating panel structure. The data set includes details on individual workers' net wages; hours of work and

job tenure; educational and demographic characteristics; and detailed information on retrospective monthly labor force activity.

The data from W. Germany is drawn from the Mikrozensus, an annual cross-sectional survey of 1% of the German population covering similar variables as the Enquête, with exception of time-use. Since the Mikrozensus is a repeated cross-section, we also use the IAB-Subsample (IABS) to construct mobility measures for W. Germany. The IABS is a 1% sample from the national employment registry of social security records spanning the period from 1975 to 1995, and contains detailed administrative information on wages and employment transitions. To obtain comparable figures for the U.S., in some instances we pool several years from the demographic supplements to the March Current Population Survey.

The sample of workers consists of both men and women age 16 to 55 with valid information on educational attainment. To obtain comparable education measures we construct years of schooling comparable to the U.S. definition. Thereby, apprenticeships in Germany are counted as part schooling, part labor market experience as in Krueger and Pischke (1995). We experimented with different definitions, calculating for each the returns to experience, the returns to schooling, and whether degrees are linear in years of schooling. Appendix Tables 4A and 4B summarize the results. We also aggregated detailed degree information into four broad categories of education following the classification of Lauer (2001) shown in Appendix Tables 1 and 2. The four categories, No Vocational Training, Vocational Training, Intermediate and High Education correspond roughly to the standard categorization into drop outs, high-school, some college, college used in the U.S. However, due to the prevalence of vocational on-the-job training and apprenticeships in both countries, especially the no vocational training and the intermediate education categories contain workers who are still completing their training (Appendix Figure 1 shows the evolution of education decomposition by age).

The information on wages is based on net usual monthly earnings last month for France and for net monthly income last month in Germany. Since very few young workers have other income than earnings, the difference in wage concepts should not affect our results. We convert wages into

German Marks using 1995 exchange rates and analyze only workers who worked at least 30 hours a week. In some cases, we also restrict wages of to be at least 3 DM an hour (one and a half dollars).⁶ Since we show gross wages for the U.S., tax schedules might depress the slopes of the wage-experience profiles of France and Germany relative to the U.S.; since profiles are generally flatter for the U.S., this is likely to be an underestimate of the difference. It is also possible that differential rates of income taxation affect French and German slopes for older workers, but this should be less of a concern for the young.⁷

Due to modalities of data access, figures shown throughout the paper are from 1993 for W. Germany and from 1991 to 1995 for France. However, difference of unemployment rates and wages by age is stable throughout the 1990's – the pattern does not change substantially for France by the year 2000 (Appendix Figure 2) and for Germany by 1996. We thus treat the age distribution as stationary and interpret differences in cross section as informative for the longitudinal pattern of interest. We have obtained access to the data for the entire 1990s, and will incorporate it into the paper.

3.2. Unemployment and Labor Force Participation

Over the past 10 years, French employment grew much faster than its German counterpart. However, despite the ability to create jobs, the French economy has been unable to shelter the French from above average unemployment. In contrast to the poor prospects of French youth, young workers in Germany appear to be well-prepared for the labor market and to have better labor market outcomes. Figures 1A and 1B characterizes the labor force attachment of the French, German, and U.S. population from age 16 to age 50. Table 1 contains the relevant numbers for France and Germany. The first panel of Figure 1A shows that the French unemployment rate is

⁶ In the Mikrozensus, workers report net monthly income in brackets, and we take the average of the midpoint of the brackets divided by usual weekly hours rescaled to a monthly figure. For the Enquête Emploi, we can use a continuous measure of net monthly earnings. Converting the continuous French information into brackets does not affect our results.

⁷ In Appendix Figure 6 we compare the wage-earnings profiles from the Mikrozensus (net wages) and the administrative IABS (gross wages) in Germany. Once we account for differences in sample decomposition, the profiles are remarkably similar. Part of the similarity might be due to top-coding in the administrative data, something we will address explicitly in the future.

almost four times the German rate at ages 18 to 22. This difference declines gradually thereafter to be 3-5% by the late 20s. In contrast to this hump-shaped pattern, unemployment rates in Germany are stable throughout. The U.S. lies in the middle: it starts out at higher unemployment rates than Germany that decline much faster than in France.

Since unemployment rates mask trends in labor force participation, Figure 1B shows the employment population ratio. Entry into the labor force is gradual in France, whereas the education and training system in Germany leads to a steep increase in participation by age 18. However, even around age 21, when most apprenticeships in Germany have ended, participation rates drop only slightly and remain above France's.⁸ Participation increases gradually in the U.S. as well, but at a higher level and faster pace than in France. Overall, patterns of early labor force participation appear to differ markedly for young workers in France and Germany. These differences fade only gradually in the mid to late 20s.

Figure 2A and 2B show that the differences in early labor force participation at the aggregate level are not driven by changes in educational decomposition, but remain within education groups. As expected, the differences in unemployment and participation are particularly large for the group with no vocational education, but are also high and persistent for the groups with vocational and intermediate education. Only for highly educated workers are there substantially smaller differences. If unemployment experiences matter for wage growth, we would thus expect differences to be concentrated among workers with vocational or intermediate training and smaller for more highly educated workers.

High unemployment and low labor force attachment implies a considerable loss in time worked. As shown in Section 6 below, an average 24 year old French worker with high labor force attachment spends only 75% of the last three years of his time working. Out of the remaining time, 20% is spent in unemployment and hardly any out of the labor force.⁹ On the other hand, German employment rates and time spent working are extremely high even after the end of apprenticeship

⁸ This dip is partly due to a drop in the participation rate of men exiting the labor force to attend military or civil service.

⁹ These are numbers for workers with at least 9 months of labor force attachment in all three years they are observed in the panel. For workers with 6 months of labor force attachment in all three years of the panel, the numbers are 72%, 24%, and 4%, respectively.

training. Based on the differences in the time and incidence of unemployment we would expect to see French workers accumulate labor force experience at a slower rate than their German counterparts and consequently grow slower. While concavity in experience-profile would imply a certain degree of catch up, the amount of time lost could also imply more persistent losses in human capital and earnings capacity for the French economy as a whole (Krueger and Lindahl 2001).

3.3. Wage-Experience Profiles

To compare early wage growth, we calculate wage experience profiles similar to that in Mincer (1974) and Card (1999). To do so, we define potential experience as age minus years of schooling minus six. The difficulty thereby is to assign years of schooling to German and French workers, since no direct measure of years of schooling is available in the data. For Germany, we assign apprenticeships two years of schooling as Krueger and Pischke (1995), including alternative estimates in the appendix. In France, apprentices are much less common, but it appears students tend to stay longer in school than what official degree durations would imply.¹⁰ The measure of years of education we use combines information on official degree duration as well as direct survey measures of school leaving ages. To exclude temporary work during high school or college we restrict our sample to workers who worked at least 30 hours a week with a minimal wage of 3 DM (\$1.5) an hour.

Figures 3A and 3B show the evolution of average log hourly real wages in 1995 prices by potential labor market experience in France and Germany controlling for years of education and dummies for gender and foreigner. The actual wage profiles shown in Figure 3A suggest a stable difference in real wages between French and German workers across experience years. Growth rates relative to 15 years of potential experience in Figure 3B shows how growth is parallel for the first five years, after which German wages grow faster for a few years to grow again parallel from experience years ten to twenty. Wage growth in the U.S. on the other slows down significantly after the first few years in the labor market and stays well below growth in the European countries. These

¹⁰ If we use only length of degree to impute years of schooling we obtain only very few low educated workers with less than three years of experience.

patterns are confirmed in Table 2 showing marginal average returns to experience obtained from simple wage regressions in which potential experience is included as a quartic. The returns to experience are slightly higher in Germany than in France, which in turn is slightly higher than the U.S. The table also shows that growth rates in Germany depend on how we count apprenticeships – the fewer education years we assign to training, the higher the return to experience is in Germany.¹¹

Figure 4 and Table 3 show growth rates by education group. From these figures it appears France has slightly *higher* growth rates for lower educated workers. Apart these initial differences, the average difference between real hourly wages in France and Germany is surprisingly stable within each education group. In particular, there does not appear to be a difference between countries in relative wage-experience profiles across high and low education groups. This is borne out by Table 3 as well; quartic experience profiles smooth differences in growth due to single experience years. The similarity within education groups is remarkable. It appears larger aggregate experience growth rates Germany (Table 2) are partly driven by graduation from apprenticeships, not from differences within education group. While these gains might be partly due to experience accumulated during apprenticeships, the differences in labor force attachment within education groups would indicate differences in wage growth there as well. However, similarity in wage-experience profiles stands in remarkable contrast to the differing unemployment experience. At an aggregate level, it does not appear that differences in the time worked or in unemployment rates more generally affects the degree or pattern of wage-growth. Since the French initially spend less time on the job and change jobs more often, this suggests that job mobility may have a productive role in early wage growth.

4. Job Mobility in France, Germany, and the U.S.

To measure job mobility in France we exploit the rotating panel structure of the Enquete Emploi. Using reported job tenure, we define a job change for workers in full-time employment in both periods to occur if job tenure at the survey date is less than 12 months. To guarantee a sufficient number of observations, data for France pools mobility rates from 1992 to 1995. For Germany we create an annual panel out of the continuous career information from the IABS. We

¹¹ This can also be seen in Appendix Figures 3A and 3B that display different experience profiles for Germany.

keep a cross-section of individuals for 1995, and define mobility as a change in the identification number of the establishment between two adjacent years. Our main measure of job mobility then is the fraction of full-time workers changing establishments between two adjacent years.¹²

Figure 5 shows the annual fraction of workers who change jobs by age; Table 4 contains average annual mobility rates by age-group. The figures suggest several key points. First, job mobility for young French workers is high: between the age 18 and 23 the average mobility rate is 24%, reaching a peak of 33% at age 20. As a benchmark, we also included a series for job change in the U.S. derived from the March CPS. The U.S. series is the fraction of full-time workers with a minimal wage reporting more than one employer last year. Since the series does not condition on consecutive employment in two periods (and thus contains new entrants with higher mobility rates) this might overstate job mobility for younger workers and should only be taken as approximate figure. The result is remarkable: Figure 5 suggests that the age gradient of job mobility for very young French and American workers is similar. Starting at age 24, mobility in France trends downward more rapidly in the U.S.

A second striking feature of the French data is the hump-shaped pattern of job mobility. This pattern corresponds quite closely to the coverage of fixed-term contracts. This is shown in the lower panel of Figure 5. About 75% of French workers at age 18 or younger are covered by a fixed term contract, the rate falling steeply between age 18 and age 20. According to the figure, from age 18 to 19, 40% of French workers exit from a fixed-term contract. Since preliminary tabulations suggest 70% of workers move at the end of a fixed-term contract, this implies job mobility at age 19 of 28% -- closely matching the mobility rate in the upper panel of Figure 5 (~30%). The properties of fixed term contracts, such as duration and age of entry, appear to be important determinants of observed mobility rates.

Young Germans appear to switch jobs less frequently than their French and American peers. This is summarized in Table 4. While by averaging over ages the Table masks the early congruence of France and US, it demonstrates nicely the effect of the apprenticeship system in Germany before

¹² Since the IABS does not include self-employed, civil servants, and military personnel, these are excluded from the French data as well with almost no effect on the French mobility rate.

age 20. After age 20, mobility in Germany rises and peaks at age 22. For age 21 to 23 mobility rates in France and Germany are not dissimilar, and for age 24 and beyond mobility rates of German workers are *higher* than those of French workers. Germany then becomes slightly more similar to the U.S. From age 30 on, the stable remaining difference in mobility with respect to the U.S. is 3-4 percentage points or about 40%.

As shown in the lower panel of Figure 5, the hump-shaped pattern again corresponds to the end of fixed term contracts. Due to the difference in schooling systems, German workers start apprenticeships when they are slightly older, and apprenticeships tend to be longer than fixed term contracts. Thus, the hump for German workers is shifted towards older ages. However, it can only partly be explained mechanically by the end of fixed term contracts.¹³

Overall, it appears young French workers have higher rates of job change than young German workers in their early 20s. Instead, they look more like their American peers. The pattern may be driven in part by the prevalence of fixed-term contracts. Overall, this is consistent with an environment in which young French workers spent more time searching for jobs than their German counterparts. On the other hand, French mobility rates are much lower than both German and American rates starting in the mid-20s. Moreover, German mobility rates follow a similar pattern than in France and are relatively large as well. Thus, consistent with what others have found (e.g., Euwals and Winkelmann 2002, von Wachter and Bender 2004) it appears job change is a prevalent feature of German labor market as well, and it is particularly important for young workers.

Since the definition of job mobility used is different in France and Germany, and the IABS is of different nature than both the Enquete Emploi, it is important to assess the question of comparability. The remainder of the section will discuss three measurement issues: differences arising from comparing administrative to survey data; the presence of compulsory military service; and the use of job tenure to measure job mobility. In particular, the IABS covers only workers covered by social security, excluding self-employed, public servants, as well as low-level temporary

¹³ Coverage by fixed-term contracts is above 75% for ages 17 to 19, and gradually declines thereafter. Between age 19 and 21 24% of apprentices finish their training; with an exit rate of 40%, this implies an increase of mobility by about 10%, which is borne out by the data. A similar association works less well for ages 21 to 25 – fixed-term contracts decrease and mobility starts to decline.

jobs. Moreover, the source of information in the IABS is the employer, not the individual worker himself. On the one hand, the IABS may overstate mobility due to its detailed registration of employment relationships. On the other hand it may understate it for not capturing moves among jobs not covered by social security, a source of mobility particularly relevant for young workers. To benchmark the IABS data used also for the analysis of wage growth below, we can use a question posed in the 1996 Mikrozensus that asks whether an individual has changed establishment since the last survey date.¹⁴ Appendix Figure 3 reveals that the rate of job change as measured by the IABS is very accurate. As expected, it understates mobility for younger workers slightly, but does a good job starting at age 20.

During the 1990s, in both France and Germany young men at the age of 18 are required to attend a period in either compulsory military or social service. In both countries men could defer military service until the end of school or a traineeship. Entry into the military could lead to a mechanical increase in job mobility if men leave the labor force to join the military service in between the survey dates.¹⁵ This could pose a problem since French men finish compulsory schooling and ensuing vocational training at younger ages, and are thus typically drafted earlier than German men. However, the age gradient in job mobility rates between men and women does not differ substantially. Moreover, mobility among French men rose rather than fell after military service was abolished. This indicates that mobility is not mainly driven by military service. To address this issue directly, we used the data from the Mikrozensus to exclude men attending the military. The rate of job mobility indeed drops by about 4% for men at the peak of mobility at ages of 21 and 22. Although it should be kept some of the differences in job mobility might be due to different timing of military service, this is unlikely to explain the bulk of the gap.

Last, some of the differences in Figure 5 might arise if using job tenure to calculate job endings overstates mobility. We do not have an alternative measure of mobility in France, but the

¹⁴ From the questionnaire it is clear that both the Mikrozensus and the IABS take the physical location of production to mean an establishment. This measure should thus also count changes occurring between establishments for the same employer.

¹⁵ Since the main date of notification for the IABS is January 1st of each year, and the Enquete Emploi is fielded in March, this is less of a problem if military service starts at the end of a school or training year, most often in the summer.

1996 Mikrozensus has information on job tenure. Since we cannot exclude workers entering the labor force, a measure based on tenure from the Mikrozensus vastly overstates mobility for younger workers (this is shown in Appendix Table 4). However, even after age 25 the tenure-based measure overstates mobility by about 20% for remaining ages. While the tenure-based measure should overstate mobility if workers report job-changes within establishment, it should be lower (and more correct) if workers smooth over transitions between establishments at the same employer.¹⁶ While this clearly deserves more detailed analysis, as a short cut we have discounted the French job mobility series proportionally by a factor of 1/1.2. This is conservative, since some education groups (most notably those without vocational education) have higher discrepancy in the German data than others. The discounted series (not shown) has a lower peak and is shifted towards the German series. However, overall it does not reverse the main message from Figure 5 – French workers are more mobile than Germans until the mid-20s, after which Germans are more mobile for all remaining ages.

5. Job Changes and Wage Growth

The results on job change are consistent with a higher prevalence of job search in France than in Germany. To gain insights about the effect of job changes on wage growth, difference between average log wages at two ages for workers employed at both ages can be written as:

$$\bar{w}(a+1) - \bar{w}(a) \equiv [1 - p_m(a)]g^s(a) + p_m(a)g^m(a) \quad (1)$$

where $p_m(a)$ is the fraction of workers changing jobs between age a and $a+1$, $g^s(a)$ is the average wage growth of workers staying at the same job between age a and $a+1$, $g^m(a)$ is the average wage growth of workers moving jobs between age a and $a+1$. To focus on the benefits of job mobility, we ignore workers entering and exiting from non employment.¹⁷ Equation (1) can be used to essentially

¹⁶ The tenure question in both the Mikrozensus and the Enquete Emploi refers to time at the current employer. In the Mikrozensus, the question asks “In which year and month have you taken up your activity for the current employer?” In the Enquete it is “At which date did you start working for the firm that currently employs you?” Given the possibly ambiguous interpretation of the word ‘activity’ in German, the responses in the Mikrozensus might be more distorted than in the Enquete.

¹⁷ In work in progress we use an extended version of Equation (1) to account for the wage losses of job losers and the extent of selection from entry and exit (see Manning 2002, Chapter 6 for a detailed discussion).

reproduce Topel and Ward’s (1992) seminal results on the role of between-job wage growth for the results. To do so, we will also define the wage gain from a job change to be

$\Delta \equiv g^m(a) - g^s(a) \times f(a)$, where $f(a)$ is the average fraction of time a mover of age a can expect to be working. Consistent with what we report below, we impute the expected fraction of time working with the employment population ratio (for all workers shown in Table 1).

To replicate Topel and Ward’s numbers (their Table VII), we calculate average and cumulative wage changes by experience groups for both movers and stayers, and relate it to total cumulated wage growth. I.e., we show

$$frac_m(a) = \frac{\sum_a p_m(a) g^m(a)}{\sum_a g(a)}$$

However, our sample of workers differs from theirs – it includes women. Again, we include all those employed in two consecutive periods working full time with wage of at least 3 DM. This is shown in Table 5. Ideally, the analysis would control for transitions at end of apprenticeships in Germany and other fixed term contracts in France that lead to mechanical wage increases. Such changes in the decomposition obscure the actual evolution of wage growth due to human capital accumulation for stayers or gains from search for movers. Table 6 explores the role of apprentice graduation in Germany. Table 7 further addresses the role of timing by showing the decomposition for single ages. Finally, Table 8 analyzes the cumulative contribution of wage growth and wage gains at job changes for single ages.

Table 5 shows that initial wage growth in France is very high for both movers and stayers, likely due to the end of fixed term contracts.¹⁸ For all experience years, movers have higher wage growth than stayers. Since job mobility is high, this implies an important role for job mobility in cumulated wage growth. Overall, 30% of wage growth in the first ten years of potential experience occurs at job changes. The peak is at 4-6 years and then falls to a stable 23%. The results for the U.S. males are shown in Panel C of the Table. Initially, movers account for a very high fraction of growth (53%) that then declines to 28%. In the first ten experience years, the fraction is 40%. Movers

¹⁸ Table 6 shows that this is likely to be driven by very early entrants.

contribute to wage growth to a similar extent in France as in the U.S.; this result is consistent with an important role of job search in both countries, as the results on job mobility would have led us to expect. As shown in Panel B of Table 7, this conclusion is only hardly affected if we look at wage gains (e.g., the third column).

The results for Germany are more surprising. The gradient in growth rates clearly reflects the prevalence of apprenticeships in the early experience years. Thus, a large fraction of growth occurs in experience years 4-6, a period with particularly high growth for movers. Since job mobility generally is lower, this is likely to arise from the fact that those finishing apprenticeships have a higher weight among movers than among stayers, emphasizing the need for apprenticeship controls. Yet, the last column shows that despite the changes in average growth rates the contribution of movers to growth is stable at around 35% after the end of apprenticeships. For higher experience years, it is about as large as in the U.S.

Table 6 shows how part of these changes are due to high wage increases at the end of apprenticeships. Although these accrue to both movers and stayers, they nevertheless reduce wage growth accounted for by job mobility in the first decade in the labor market to 21%. As expected, the biggest decline is for the early experience years, with little effect after 6 potential experience years. In figures not shown, controlling for the end of apprenticeships in Germany can explain most of the hump-shaped pattern observed in both job mobility and wage growth. The basic numbers from Table 5 are confirmed when we reweigh the administrative IABS data to match the distribution of apprentices in the more representative Mikrozensus (Table 6, Panel B), or when we again control for apprenticeship graduation (Table 6, Panel C). Overall, it appears mobility explains a large fraction of early wage growth in Germany, but not as large as in France or the U.S.

Since movers are likely to spend some time working, and more so in Germany than in France, it is important to control for wage growth that might have occurred in the absence of moving. This is done in Table 8 for single ages. The table contains three messages. First, when looking at the proportion of growth at job changes in cumulated wage growth, it appears that in France job search matters more at very early ages but that Germany catches up (columns 7 and 8 of

Panel A). Second, this gradual catch up becomes slower and incomplete when we consider *gains* from job change (columns 7 and 8 in Panel B). Third, Germany gradually catches up but remains below France. However, the proportion of growth explained by gains from mobility is large in both countries: 27% for France and 23% for Germany. The fraction referring to gains for U.S. males is 30% (Topel and Ward 1992, Table VIII).

Clearly, job search has the potential to explain an important fraction of wage growth in France and Germany. Strikingly, its importance in France is not too far from that in the U.S., our ‘most flexible’ benchmark. Although job mobility is less important in Germany, it is still an important channel of growth. While it is surprising that wage mobility seems to matter as much in Germany, it is consistent with recent results on the mobility of German apprentices cited above.

6. Actual Work Experience and Wage Growth

The results in the previous section suggest that French workers possibly ‘compensate’ part of their losses in work experience by more active job search and job matching. However, the differences in labor force experience appear too large to be fully compensated by job matching. To be consistent with similar trajectories of wage growth, time worked must not matter as much as in France as in Germany. However, not much is known about the true returns to work experience. To provide direct evidence on the potential trade-off between job mobility and work experience, we can use the monthly time-use data in the Enquete Emploi (EE) and the German IABS to characterize the experience losses due to unemployment and to estimate the effect of time worked on wage growth.

6.1. Actual vs. Potential Work Experience

The EE consists of a three year rotating panel. In each year, individuals are asked to fill out retrospective questions on the principal activity in each of the last 12 months. This provides rich information on the incidence and duration of unemployment and out-of-the labor force spells that allows us to better characterize the incidence and duration of labor force experience. The upper panels of Figure 7 show the fraction of months spent working and in unemployment in the last year and in the last three years. To make sure we consider workers who should be searching for jobs and

are at risk of losing valuable experience and not workers on temporary training, in the military, or with tenuous labor force attachment, we restricted labor force participation to be at least 9 out of 12 months for the current and the past year (the past two years when computing the three year measure). We could have alternatively restricted ourselves to workers employed in two adjacent periods as in the previous section.

Figure 7 shows that there appear to be considerable losses in employment even for workers with relatively high labor force attachment. For example, a 23 year old worker on average reports to have only spent 75% of the past three years working. For this group of workers, the remaining fraction is almost entirely spent in unemployment. If we only require 6 months of labor force participation in the current and preceding years, the amount of time not in the labor force for a 23 year old increases to 5%. The lower panels of Figure 7 show that the heterogeneity in the amount of time worked is high and that losses in time worked are quite concentrated. The median worker hardly experiences any loss, while workers at the 20th percentile work only 4 to 5 out of 12 months in the early 20s. However, the distribution among young workers is much less skewed than among older workers.

An interesting feature of Figure 7 is that the unemployment rate (Figure 1) matches the average fraction of months spent in unemployment fairly well. A similar result holds for the employment-population ratio and the number of months worked. Thus, the employment-population accurately reflects the expected fraction of a year a worker can expect to work and can be used to successfully impute actual labor market experience at the group level when explicit information is missing. On the other hand, it is apparent from the Figure that potential labor force experience is a bad measure of actual experience for young workers in France.

6.2. The Returns to Time Worked

These numbers suggest considerable losses in time worked among young French workers. To measure the effect of these losses on wage growth directly, the panel structure of the data allows us to estimate several simple dynamic panel data models. Specifically, we regressed annual individual

wage growth on the fraction of actual amount of time worked last year and a series of observable characteristics X_{it} , i.e., we estimated

$$\Delta w_{it} = \alpha + \beta f_{it} + \gamma X_{it} + u_{it}, \quad t = 1, 2,$$

where f_{it} denotes the fraction of time worked last year. Clearly, the advantage of this approach over the standard estimates shown in Table 2 is that it uses a direct measure of labor force experience. In addition, the approach implicitly controls for permanent differences in ability that may be correlated with experience accumulation. Moreover, we can control for a series of additional characteristics that turn out to be important, such as the incidence of job mobility or age.

Nevertheless, the approach does not control for remaining biases from reverse causality or selective labor force participation. For example, if higher wage-innovations induce higher labor force participation, the coefficient estimate on time worked will be upward biased. The same problem arises if those benefiting most from experience are more likely to be employed. Thus, the estimated coefficient is best interpreted as an upper bound of the returns to actual experience. Similar arguments can be made for the coefficient on the job change dummy. Another issue is that the level of experience usually enters non-linearly into the wage equation. Since we cannot include both level and changes in the models due to a lack of data, we ran the results separately by age groups.

Table 9, Panel A displays the results for full time workers present in the sample for all three panel years for age 18 to 30. To maximize the number of observations, the table pools survey years from 1991 to 2002. The first column reproduces the basic OLS estimate shown in Table 2 (with the same specification). The average annual rate of return to a year of experience in the first ten years is again estimated to be 8%. A dummy for job change enters significantly negative (without affecting the experience coefficients). If worker fixed effects are included, the estimated return is reduced to a still significant 5% (since this implicitly considers wage changes). The job change dummy is now positive, albeit insignificant.

We then regressed wage *growth* only on the actual amount of time worked last year and a constant. The coefficient is significantly negative and large. However, once we include a dummy for job change, the coefficient becomes a positive 2.2%. This is exactly what we would expect if job

change is important for wage growth but negatively correlated with time spent working. However, the magnitude of the return to experience is now small and the estimate is insignificant. The coefficient on job change on the other hand is highly significant and large. Including further explanatory variables (education, gender, nationality, and year dummies) merely raises standard errors (Column 5). To measure the effect of mechanical changes in wage growth, we also included a quartic in potential experience in Column 6. That decreases the coefficient on mobility to .035 (still highly significant) and it increases that on time worked to .029, now significant at a 10% level. This follows again from an omitted variables bias argument: both wage growth and job changes decline with experience, leading the job change dummy to pick up part of the mechanical experience-gradient in wage-growth. The reverse intuition holds for time worked. To further probe the results, the last column allows for permanent differences in wage growth among individuals by including worker fixed effects, i.e., the model estimated is

$$\Delta w_{it} = \alpha + \mu_i + \beta f_{it} + \gamma D_{it}(Mover_{it}) + \delta Educ_{it} + \lambda Age_{it} + u_{it}.$$

Since we have a very short panel, this should be interpreted with caution. It would suggest that workers with a higher average rate of wage growth tend to have higher labor force attachment and lower job mobility. Controlling for fixed growth differences also again implies an insignificant return to experience at 2.2% and an average highly significant gain from job change of 5%.

Table 10 then displays the same regressions run for Germany. The German administrative data allows us to calculate days worked in the last year, and this is the measure of time worked we use. We experimented with various ways of collapsing the measure to the monthly level without essential bearing on the result. While the same omitted variable biases are present in the German data, the main specifications suggest a large and significant return to time worked. Since variation in time worked is much more selective in Germany, the scope of selection bias is greater. This is partly confirmed by the fixed effect estimate in the last column of Panel A, which, in contrast to the French case, shows a significant drop in the returns to experience. Interestingly, the returns to job change are larger than in France and tend to increase even further, suggesting a certain degree of negative selection into mobility. These results differ markedly from the French case and speak

towards a more important role of on the job experience accumulation (note that these results are robust for excluding apprentices from the sample).¹⁹

Panel B of Tables 9 and 10 show the same regressions for older workers. For French mature workers we find a stronger and significant effect of the returns to experience on growth. Thus, they have a larger return to experience than younger workers. This is consistent with an extensive literature on the positive effect of job tenure and a decline in the frequency and importance of job change. Interestingly, the results for German mature workers (who gain less than younger workers from experience) are very similar. In the full model, French are estimated to gain to gain 4.4% from an additional year of work, German workers are predicted to gain 6.6%. In the model with fixed effects, the corresponding estimates are 5.4% and 5.9% for France and Germany, respectively.

Conditional on a dummy for job change, time worked appears to matter for growth in both France and Germany. However, it does so to a much lesser extent for French young workers (and with a much higher standard error) than in standard models that do not measure actual time worked or than in Germany. It appears that job mobility has a significant and robust impact on growth for all groups and countries. These results are very consistent with that of previous sections: while it appears that job change matters significantly for wage growth in France, time worked plays a lesser role.²⁰ Similarly, we find that both time worked and job change matters for Germany. For older workers, the results on time worked are very similar across countries. Consistent with higher incidence of mobility, mature German workers benefit more from job changes.

7. Conclusion

Although high unemployment rates in France lead to a significant loss in time spent working, they appear to lead to only slightly lower rates of wage growth than in Germany. While in contradiction with simple models of on-the-job human capital accumulation, these patterns could be

¹⁹ All regressions in Table 10 include a dummy for end of apprenticeship. Graduating from apprenticeships is negatively correlated with time worked and positively correlated with wage growth. Thus, we have to include this control to avoid underestimating the effect of time worked due to omitted variable bias.

²⁰ When the same regressions in Table 8 are run for older workers, we find a stronger and significant effect of the returns to experience on growth. This is consistent with an extensive literature on the positive effect of job tenure and a decline in the frequency and importance of job change.

explained by a more important role of job search and job matching in France. The paper explores the hypothesis that the wage growth has different sources in the two countries. In particular, it asks whether France is similar to the U.S. in its experience of high incidence and high gains from job mobility; and whether Germany seems to be the opposite polar case, with most of wage growth occurring on the job.

A detailed analysis based on large micro-data sets accepts the first part and partly rejects the second part of the hypothesis. Young French workers appear as mobile and grow as much by changing jobs as their American peers, and more are mobile than German workers. Moreover, job mobility appears more important for wage growth in France than in Germany. However, job search seems to be more prevalent and beneficial in Germany than a pure ‘on-the-job’ scenario would suggest. To reconcile this result with both similar wage growth and large differences in labor force experience, time worked should not be a crucial determinant for wage growth for young French workers. Using information on time-use in France and Germany to directly estimate the returns to actual labor market experience, the paper suggests that this is indeed the case. Controlling for fixed effects and observable characteristics young French workers do appear to gain much less from time worked than German workers. The return to time worked for mature French and German workers on the other hand is similar.

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Table 1A: Descriptive Statistics France vs. Germany

France	Fraction	Unemp. Rate	Emp.-Pop. Rate	Fraction Out of Labor Force	Log Real Hourly Wages
18-22	14.4	25.0	25.5	66.1	2.11
23-26	10.9	16.5	65.8	21.3	2.36
27-30	11.4	11.6	76.5	13.5	2.49
31-35	14.2	9.7	77.6	14.2	2.56
36-40	14.3	8.1	79.3	13.8	2.61
41-45	14.5	6.9	80.7	13.3	2.66
46-50	10.9	6.7	77.8	16.6	2.69
51-55	9.5	7.4	69.5	24.9	2.66

Germany	Fraction	Unemp. Rate	Emp.-Pop. Rate	Fraction Out of Labor Force	Log Real Hourly Wages
18-22	8.1	7.2	73.1	21.2	2.12
23-26	11.6	7.6	69.9	24.3	2.51
27-30	13.0	7.2	75.1	19.1	2.67
31-35	14.8	6.9	77.2	17.0	2.79
36-40	13.3	5.9	79.6	15.4	2.85
41-45	12.9	5.8	81.0	14.0	2.87
46-50	8.8	5.0	79.5	16.3	2.88
51-55	17.4	5.8	74.0	21.4	2.87

Notes: All individuals with valid information on education. Wages are in 1995 DM and restricted to full time workers earnings at least 3 DM an hour. 1993 Mikrozensus and 1991 and 1993 Enquete Emploi.

Table 1B: Basic Characteristics by Education Group

Germany	Fraction	Unemp. Rate	Emp.- Pop. Rate	Fraction Out of Labor Force	Log Real Hourly Wages
No Vocational	17.9	12.5	62.9	28.1	2.40
Vocational	53.5	5.7	80.5	14.7	2.69
Intermediate	16.7	4.6	68.6	28.0	2.83
High Education	11.9	4.2	87.8	8.3	3.18

France	Fraction	Unemp. Rate	Emp.- Pop. Rate	Fraction Out of Labor Force	Log Real Hourly Wages
No Vocational	43.0	14.2	59.6	30.6	2.43
Vocational	27.3	9.3	78.9	13.0	2.50
Intermediate	13.5	8.2	62.1	32.3	2.64
High Education	16.2	5.3	80.8	14.6	2.88

Notes: See Table 1A.

Table 2: Returns to Potential Experience from Mincer Regressions

	France	Germany		USA
		Apprentices treated as:		
		1 Year of Schooling	2 Years of Schooling	
Average Annual Return to Potential Experience				
10 Years	0.06	0.084	0.072	0.05
5 Years	0.08	0.112	0.094	0.07
Potential Experience				
Linear	0.111 (0.0023)	0.166 (0.0026)	0.129 (0.0024)	0.090 (0.0057)
Square	-0.006 (0.0002)	-0.010 (0.0002)	-0.007 (0.0002)	-0.005 (0.0006)
Cubic	0.00018 (0.00001)	0.00029 (0.00001)	0.00020 (0.00001)	0.00013 (0.00002)
Quartic	-0.0000020 (0.0000001)	-0.0000030 (0.0000001)	-0.0000020 (0.0000001)	-0.0000012 (0.0000003)
Years of Schooling	0.108 (0.0004)	0.076 (0.0004)	0.082 (0.0004)	0.111 (0.0013)
Female-Dummy	-0.131 (0.0015)	-0.228 (0.0023)	-0.225 (0.0023)	-0.223 (0.0054)
Foreign-Dummy	-0.053 (0.0029)	-0.066 (0.0040)	-0.040 (0.0040)	-0.091 (0.0076)
R2	0.35	0.43	0.43	0.3179
Observations	190757	113423	113462	27016

Notes: Sample covers years 1991 to 1995 for France, 1993 for Germany, 1994-96 for the US. French regression includes year dummies. The sample covers all workers ages 18 to 55 with real hourly wages at least 3 DM in 1995 Exchange Rates and in 1995 prices and usual weekly hours worked at least 30. Robust standard errors in parentheses.

Table 3: Average Annual Marginal Effects by Education Group

		France	Germany		USA
			Apprentices treated as:		
			1 Year of Schooling	2 Years of Schooling	
Low Education	10 Years	0.11	0.11	0.11	0.04
	5 Years	0.15	0.14	0.14	0.05
Vocational Training	10 Years	0.05	0.06	0.05	0.04
	5 Years	0.07	0.07	0.06	0.05
Intermediate Education	10 Years	0.06	0.07	0.07	0.06
	5 Years	0.07	0.10	0.10	0.08
High Education	10 Years	0.05	0.04	0.04	0.07
	5 Years	0.06	0.05	0.05	0.11

Note: Table contains average annual returns to schooling in year groups as predicted from a quartic function of experience in a standard human capital model controlling for a female and foreign or race dummy, as well as year dummies if appropriate. For the US, the education groups are less than high-school, high school, some college, at least college.

Table 4: Job Mobility Rates

Age Group	France	Germany	USA
18-20	0.24	0.09	0.33
21-23	0.24	0.20	0.29
24-26	0.13	0.16	0.24
27-29	0.09	0.13	0.18
30-35	0.06	0.11	0.15
36-40	0.04	0.08	0.12
41-45	0.03	0.07	0.10
46-50	0.03	0.06	0.09

Notes: See text.

Table 5: Job Mobility and Wage Growth Between Jobs by Experience

Panel A: France

Years of Potential Experience	Average Wage Growth			Fraction Job Changers	Cumulative Wage Growth		
	Total	Movers	Stayers		Total	Movers	Fraction
1-3	0.26	0.29	0.25	0.25	0.78	0.22	0.28
4-6	0.12	0.17	0.10	0.23	0.36	0.12	0.34
7-9	0.04	0.07	0.04	0.13	0.12	0.03	0.23
10-12	0.02	0.06	0.02	0.09	0.07	0.02	0.22
13-15	0.02	0.07	0.02	0.06	0.06	0.01	0.23
1-10	0.13	0.17	0.12	0.14	1.28	0.38	0.30
1-15	0.09	0.13	0.09	0.15	1.39	0.40	0.29

Panel B: Germany [Treating Apprentices as 2 Years Schooling]

Years of Potential Experience	Average Wage Growth			Fraction Job Changers	Cumulative Wage Growth		
	Total	Movers	Stayers		Total	Movers	Fraction
1-3	0.15	0.29	0.14	0.09	0.30	0.05	0.17
4-6	0.20	0.41	0.16	0.17	0.61	0.21	0.34
7-9	0.07	0.16	0.05	0.15	0.20	0.07	0.36
10-12	0.03	0.09	0.02	0.13	0.10	0.04	0.37
13-15	0.03	0.08	0.02	0.11	0.08	0.03	0.34
1-10	0.13	0.27	0.10	0.14	1.15	0.35	0.30
1-15	0.09	0.20	0.07	0.13	1.28	0.39	0.31

Panel C: USA, Men Only (Topel and Ward 1992, Table 7)

Years of Potential Experience	Average Wage Growth			Fraction Job Changers	Cumulative Wage Growth		
	Total	Movers	Stayers		Total	Movers	Fraction
0-2.5	-	0.17	-	-	0.32	0.17	0.53
2.5-5	-	0.12	-	-	0.29	0.12	0.41
5-7.5	-	0.08	-	-	0.20	0.05	0.26
7.5-10	-	0.06	-	-	0.14	0.04	0.28
0-10	-	0.11	-	-	0.95	0.38	0.40

Notes: See text.

Table 6: Sensitivity of Wage Decomposition in Germany

Panel A: Germany - Apprentice Controls

Years of Potential Experience	Average Wage Growth			Fraction Job Changers	Cumulative Wage Growth		
	Total	Movers	Stayers		Total	Movers	Fraction
1-3	0.11	0.16	0.11	0.08	0.23	0.03	0.11
4-6	0.08	0.14	0.07	0.14	0.24	0.06	0.24
7-9	0.04	0.09	0.03	0.15	0.12	0.04	0.33
10-12	0.03	0.08	0.02	0.13	0.09	0.03	0.36
13-15	0.02	0.07	0.02	0.11	0.07	0.02	0.33
1-10	0.07	0.12	0.06	0.13	0.62	0.13	0.21
1-15	0.05	0.10	0.05	0.12	0.74	0.17	0.24

Panel B: Germany - Reweighted to Match Mikrozensus

Years of Potential Experience	Average Wage Growth			Fraction Job Changers	Cumulative Wage Growth		
	Total	Movers	Stayers		Total	Movers	Fraction
1-3	0.14	0.31	0.13	0.09	0.28	0.05	0.19
4-6	0.20	0.42	0.15	0.16	0.58	0.20	0.35
7-9	0.06	0.16	0.05	0.15	0.19	0.07	0.36
10-12	0.03	0.08	0.02	0.13	0.09	0.03	0.36
13-15	0.02	0.07	0.02	0.10	0.07	0.02	0.32
1-10	0.12	0.27	0.10	0.13	1.09	0.34	0.31
1-15	0.09	0.20	0.07	0.13	1.21	0.38	0.31

Panel C: Germany - Reweighted with Apprentice Controls

Years of Potential Experience	Average Wage Growth			Fraction Job Changers	Cumulative Wage Growth		
	Total	Movers	Stayers		Total	Movers	Fraction
1-3	0.12	0.23	0.11	0.08	0.24	0.04	0.15
4-6	0.07	0.15	0.07	0.11	0.22	0.05	0.22
7-9	0.04	0.08	0.03	0.14	0.11	0.03	0.30
10-12	0.03	0.07	0.02	0.13	0.08	0.03	0.36
13-15	0.02	0.06	0.02	0.10	0.07	0.02	0.30
1-10	0.07	0.14	0.06	0.11	0.60	0.13	0.21
1-15	0.05	0.11	0.04	0.11	0.72	0.17	0.23

Notes: See text.

Table 7: Decomposition of Annual Wage Growth: France vs. Germany**Differences in Growth and Mobility Rates**

Age	Total Growth		Fraction Job Movers		Growth Stayers		Growth Movers	
	France	Germany	France	Germany	France	Germany	France	Germany
19	0.49	0.13	0.29	0.08	0.50	0.12	0.46	0.29
20	0.22	0.23	0.33	0.13	0.18	0.20	0.30	0.50
21	0.11	0.29	0.26	0.20	0.10	0.24	0.15	0.51
22	0.11	0.23	0.23	0.20	0.09	0.18	0.17	0.41
23	0.08	0.16	0.23	0.18	0.05	0.13	0.16	0.30
24	0.07	0.11	0.16	0.18	0.06	0.09	0.11	0.23
25	0.06	0.07	0.14	0.16	0.05	0.05	0.15	0.18
26	0.05	0.05	0.10	0.14	0.03	0.04	0.16	0.12
27	0.04	0.04	0.12	0.14	0.03	0.03	0.14	0.10
28	0.03	0.04	0.09	0.13	0.03	0.03	0.05	0.09
29	0.03	0.03	0.07	0.13	0.03	0.03	0.07	0.08
30	0.03	0.03	0.08	0.12	0.03	0.02	0.07	0.10

Notes: See text.

Table 8: The Role of Wage Changes and Wage Gains of Job Movers in Cumulative Growth

Panel A: Cumulative Growth and its Sources

Age	Between Job Growth as Fraction of Total		Cumulated Total Growth		Cumulated Between Job Growth		Fraction Between Growth Among Cumulated Growth	
	France	Germany	France	Germany	France	Germany	France	Germany
19	0.28	0.16	0.49	0.13	0.13	0.02	0.28	0.16
20	0.45	0.28	0.71	0.37	0.23	0.09	0.33	0.24
21	0.35	0.36	0.82	0.66	0.27	0.19	0.33	0.29
22	0.35	0.37	0.93	0.89	0.31	0.28	0.33	0.31
23	0.46	0.34	1.01	1.05	0.35	0.33	0.34	0.32
24	0.24	0.37	1.08	1.16	0.36	0.37	0.34	0.32
25	0.32	0.39	1.14	1.23	0.38	0.40	0.34	0.32
26	0.35	0.33	1.19	1.28	0.40	0.42	0.34	0.32
27	0.39	0.39	1.23	1.32	0.42	0.43	0.34	0.33
28	0.14	0.33	1.26	1.36	0.42	0.44	0.33	0.33
29	0.14	0.33	1.30	1.39	0.42	0.45	0.33	0.33
30	0.17	0.37	1.33	1.42	0.43	0.47	0.32	0.33

Panel B: Wage Gains of Job Movers

Age	Gain of Movers		Between Job Gains as Fraction of Total		Cumulated Between Job Gain		Fraction Between Gain Among Cumulated Growth	
	France	Germany	France	Germany	France	Germany	France	Germany
19	0.39	0.19	0.23	0.11	0.11	0.01	0.23	0.11
20	0.25	0.35	0.38	0.20	0.20	0.06	0.28	0.16
21	0.12	0.34	0.28	0.24	0.23	0.13	0.28	0.20
22	0.13	0.28	0.26	0.26	0.26	0.19	0.27	0.21
23	0.13	0.22	0.37	0.25	0.28	0.23	0.28	0.22
24	0.07	0.17	0.15	0.27	0.29	0.26	0.27	0.22
25	0.11	0.14	0.24	0.31	0.31	0.28	0.27	0.23
26	0.13	0.09	0.29	0.25	0.32	0.29	0.27	0.23
27	0.12	0.08	0.33	0.32	0.34	0.31	0.27	0.23
28	0.03	0.07	0.08	0.26	0.34	0.31	0.27	0.23
29	0.04	0.06	0.09	0.25	0.34	0.32	0.26	0.23
30	0.05	0.08	0.11	0.31	0.35	0.33	0.26	0.23

Notes: See text.

Table 9: Returns to Actual Work Experience and Job Mobility in France

Panel A: France Workers Age 18-30

	Wage Levels		Wage Growth on Actual Work Experience				
	(1)	(2)	(3)	(4)	(5)	(6)	(7)
	OLS	OLS with Worker Fixed Effects	Only Time Worked Last Year	with Mobility-Dummy	Additional Controls, No Experience Controls	Full Specification	Full Specification with Worker Fixed Effects
Return to One Year of Employment	0.076	0.049	-0.034	0.022	0.018	0.029	0.022
	-	-	(0.019)	(0.020)	(0.052)	(0.020)	(0.051)
Effect of Job Mobility	-0.019	0.017	-	0.055	0.051	0.035	0.047
	(0.006)	(0.013)	-	(0.007)	(0.020)	(0.007)	(0.020)

Notes: 24403 observations, standard errors clustered at individual level, all models include year dummies.

Panel B: France Workers Age 30-55

	Wage Levels		Wage Growth on Actual Work Experience				
	(1)	(2)	(3)	(4)	(5)	(6)	(7)
	OLS	OLS with Worker Fixed Effects	Only Time Worked Last Year	with Mobility-Dummy	Additional Controls, No Experience Controls	Full Model	Full Model with Worker Fixed Effects
Return to One Year of Employment	-0.052	-0.028	0.037	0.050	0.043	0.044	0.054
	-	-	(0.014)	(0.010)	(0.014)	(0.014)	(0.024)
Effect of Job Mobility	-0.085	-0.026	-	0.018	0.015	0.012	0.020
	(0.005)	(0.008)	-	(0.004)	(0.005)	(0.005)	(0.010)

Notes: 130705 observations, standard errors clustered at individual level, all models include year dummies.

Table 10: Returns to Actual Work Experience and Job Mobility in Germany

Panel A: Germany Workers Age 18 to 30, Counting Apprenticeships as 2 Years of Schooling

	Wage Levels		Wage Growth on Actual Work Experience				
	(1)	(2)	(3)	(4)	(5)	(6)	(7)
	OLS	OLS with Worker Fixed Effects	Only Time Worked Last Year	with Mobility-Dummy	Additional Controls, No Experience Controls	Full Specification	Full Specification with Worker Fixed Effects
Return to One Year of Employment	0.094	0.173	-0.229 (0.015)	0.101 (0.012)	0.102 (0.012)	0.098 (0.012)	0.049 (0.020)
Effect of Job Mobility	0.042 (0.002)	0.110 (0.002)		0.093 (0.002)	0.093 (0.002)	0.097 (0.002)	0.121 (0.002)

Notes: 250635 observations, standar errors clustered at individual level, all models include year dummies.

Panel B: Germany Workers Age 30-55

	Wage Levels		Wage Growth on Actual Work Experience				
	(1)	(2)	(3)	(4)	(5)	(6)	(7)
	OLS	OLS with Worker Fixed Effects	Only Time Worked Last Year	with Mobility-Dummy	Additional Controls, No Experience Controls	Full Model	Full Model with Worker Fixed Effects
Return to One Year of Employment	0.017	0.045	-0.028 (0.011)	0.065 (0.011)	0.064 (0.011)	0.066 (0.011)	0.059 (0.019)
Effect of Job Mobility	-0.050 (0.002)	0.001 (0.001)		0.055 (0.001)	0.055 (0.001)	0.053 (0.001)	0.062 (0.001)

Notes: 508164 observations, standar errors clustered at individual level, all models include year dummies.

Appendix 1: Educational attainment, Highest degree obtained

1	No vocational qualification
10	No degree G: No degree F: No degree
11	Lower secondary education G: Hauptschule F: Certificat d'etudes primaire (CEP)/ Diplome de fin d'etudes obligatoire (DFEO)
12	Intermediate secondary education G: Realschule F: Brevet d'etudes du premier cycle (BEPC)
2	Basic vocational qualification
20	No or lower secondary education+ basic vocational degree G: no degree/ Hauptschule + Lehre/Berufsfachschule F: no degree/CEP/DFEO+Certificat d'Aptitude Prof. (CAP)/Brevet d'Etudes Prof.
21	Intermediate secondary education + basic vocational degree G: Realschule+Lehre/Berufsfachschule F: BEPC+CAP/BEP
3	Intermediate qualification
30	Intermediate vocational degree G: Fachschule/ Gesundheitsschule/ Beamtenschule F: Baccalaureat Professionnel/Brevet d'Enseignement Agricole (BEA), Commercial (BEC), Industriel (BEI), Hotelier (BEH), Social (BES)
31	Vocational maturity certificate G: Fachhochschulreife F: Bac Techno/ Bac Pro/Brevet de Technicien
32	General maturity certificate G: Hochschulreife(Abitur) F: Bac General
33	General maturity certificate + vocational degree G: Hochschulreife+vocational qual. (Lehre/Fachschule) F: Bac General + vocational qual. (CAP/BEP/BP/Bac pro)
4	Tertiary level qualification
40	Lower tertiary education G: Fachhochschule/Ingenieurschule F: Bac +2: Diplome d'Et. Univ. Gen. (DEUG), Brevet de Tech. Sup. (BTS), Dipl. Univ. de Tech. (DUT)
41	Upper tertiary education G: Universitat, Technische Universitat F: Bac +3/4 and beyond (Licence, Maitrise, Bac+5, Grande Ecole)

Appendix Table 2: Fraction and Average Years of Education by Education Group

Panel A: France									
	9 Years	10 Years	11 Years	12 Years	13 Years	14 Years	16 Years	17 Years	Average Years
No vocational	71.68	28.32	0	0	0	0	0	0	9.3
Basic Vocational	0	0	100	0	0	0	0	0	11.0
Intermediate Qualification	0	0	0	94.68	0	5.32	0	0	12.1
High education	0	0	4.84	0	7.8	40.54	33.21	13.62	14.8

Panel B: Germany										
	9 Years	10 Years	11 Years	12 Years	13 Years	14 Years	15 Years	17 Years	18 Years	Average Years
No vocational	80.94	19.06	0	0	0	0	0	0	0	9.2
Basic Vocational	0	0	62.69	37.31	0	0	0	0	0	11.4
Intermediate Qualification	0	0	0	1.44	7.92	58.81	31.83	0	0	14.2
High education	0	0	0	0	0	0	0	36.84	63.16	17.6

Notes: These are years of education implied by degree length inherent in the qualifications underlying the broad categories as detailed by table Appendix Table 1.

**Appendix Table 3A: Basic Characteristics by Education and Age Group -
Germany**

	Fraction	Unemp. Rate	Emp.-Pop. Rate	Fraction Out of Labor Force	Log Real Hourly Wages	Standard Deviation of Wages
No Vocational						
18-22	18.3	9.4	73.8	1.80	18.5	0.39
23-26	8.3	19.9	58.1	2.33	27.5	0.42
27-30	8.6	18.7	56.4	2.50	30.7	0.37
31-35	11.3	16.3	59.9	2.53	28.4	0.40
36-40	10.2	12.2	63.3	2.55	27.9	0.38
41-45	11.7	10.8	65.7	2.54	26.3	0.39
46-50	9.2	9.5	62.2	2.55	31.2	0.39
51-55	22.4	10.6	58.3	2.55	34.8	0.38
Vocational						
18-22	5.7	5.9	89.1	5.4	2.35	0.37
23-26	11.5	6.1	86.3	8.1	2.52	0.32
27-30	13.1	5.8	81.9	13.1	2.63	0.33
31-35	14.9	5.9	78.2	16.9	2.71	0.36
36-40	13.7	5.5	79.9	15.4	2.76	0.38
41-45	13.6	5.6	81.2	14.0	2.77	0.40
46-50	9.3	4.8	80.3	15.6	2.78	0.41
51-55	18.1	5.6	74.9	20.7	2.79	0.42
Intermediate						
18-22	10.2	4.3	43.4	54.6	2.01	0.51
23-26	21.0	4.7	45.7	52.1	2.49	0.46
27-30	17.7	5.8	64.4	31.6	2.73	0.40
31-35	14.7	5.7	79.2	15.9	2.86	0.41
36-40	11.1	4.5	84.9	11.0	2.96	0.43
41-45	9.0	4.5	87.7	8.2	3.02	0.44
46-50	5.8	2.8	88.8	8.7	3.05	0.45
51-55	10.6	3.1	86.4	10.8	3.07	0.45
High Education						
18-22						
23-26	3.8	7.4	74.4	19.7	2.72	0.39
27-30	12.5	6.2	83.9	10.5	2.88	0.39
31-35	20.0	5.0	86.7	8.8	3.06	0.41
36-40	19.5	4.5	87.2	8.7	3.19	0.43
41-45	17.3	3.5	90.7	6.0	3.30	0.43
46-50	10.3	2.7	92.5	5.0	3.35	0.43
51-55	16.4	2.7	90.5	7.0	3.37	0.45

Appendix Table 3B: Basic Characteristics by Education and Age Group - France

	Fraction	Unemp. Rate	Emp.-Pop. Rate	Fraction Out of Labor Force	Log Real Hourly Wages	Standard Deviation of Wages
No Vocational						
18-22	17.5	29.7	21.8	2.00	69.1	0.41
23-26	7.0	24.9	59.0	2.27	21.5	0.27
27-30	8.4	18.3	64.6	2.34	21.0	0.29
31-35	12.1	15.2	66.5	2.40	21.6	0.29
36-40	14.0	12.0	69.5	2.46	21.0	0.32
41-45	15.2	9.7	73.2	2.51	19.0	0.36
46-50	12.6	9.1	70.5	2.53	22.4	0.36
51-55	13.3	9.0	64.0	2.51	29.7	0.35
Vocational						
18-22	10.1	21.4	50.7	35.5	2.17	0.27
23-26	12.8	14.6	77.8	8.9	2.32	0.26
27-30	13.8	10.2	80.7	10.1	2.43	0.29
31-35	16.2	7.9	82.9	10.0	2.50	0.29
36-40	15.2	6.6	85.5	8.5	2.57	0.31
41-45	14.9	6.0	85.2	9.4	2.62	0.33
46-50	9.8	5.6	83.2	11.9	2.67	0.35
51-55	7.4	7.0	74.7	19.7	2.69	0.37
Intermediate						
18-22	25.0	21.1	13.7	82.6	2.22	0.33
23-26	14.5	14.4	58.6	31.6	2.37	0.36
27-30	11.4	8.6	81.5	10.9	2.53	0.29
31-35	13.4	6.9	82.1	11.8	2.62	0.30
36-40	12.2	5.3	85.3	9.9	2.73	0.31
41-45	10.3	4.3	86.0	10.1	2.83	0.37
46-50	7.7	5.3	83.1	12.3	2.88	0.37
51-55	5.6	4.2	76.8	19.8	2.94	0.39
High Education						
18-22	4.3	12.3	22.8	74.0	2.38	0.32
23-26	15.1	10.1	62.7	30.3	2.55	0.32
27-30	15.4	7.2	84.3	9.2	2.73	0.32
31-35	17.0	5.1	86.8	8.5	2.88	0.36
36-40	15.7	4.1	88.4	7.9	2.96	0.39
41-45	15.5	3.3	90.0	7.0	3.04	0.38
46-50	10.7	3.1	88.9	8.2	3.13	0.45
51-55	6.4	3.2	84.7	12.6	3.17	0.45

Appendix Table 4A: Distribution of Years of Schooling for Various Measures of German Schooling

Years of Schooling	Measure Counts Apprenticeship As:				Krueger and Pischke Measure	France	USA
	All Experience	1 Year Schooling	2 Years Schooling	3 Years Schooling			
9	46.2	10.3	10.3	10.3	10.3	32.3	2.8
10	23.8	38.3	2.4	2.4	2.4	12.8	2.2
11	-	21.4	35.9		35.9	27.4	3.2
12	9.2	0.2	21.6	36.1	21.6	12.6	34.5
13	6.1	10.2	1.2	22.6	3.0	1.2	20.3
14	-	4.9	9.0		5.1	6.8	5.0
15	-	-	4.9	9.0	5.6		4.1
16	-	-		4.9	3.4	5.0	18.9
17	5.4	5.4	5.4	5.4	3.4	2.1	6.8
18	9.3	9.3	9.3	9.3			2.3
19	-				9.3		
Average	11.0	11.7	12.5	13.2	12.5	11.0	13.5

Notes: See Appendix Table 4B.

Appendix Table 4B: Compare Different Approaches to Counting German Apprenticeships

Measure of Years of Schooling	Measure Counts Apprenticeship As:				Krueger and Pischke Measure	French Returns	US Returns
	All Experience	1 Year Schooling	2 Years Schooling	3 Years Schooling			
Average Annual Return:							
10 Years	0.111	0.084	0.072	0.058	0.073	0.063	0.052
5 Years	0.151	0.112	0.094	0.073	0.097	0.083	0.068
With Azubi-Status Control							
10 Years	0.061	0.052	0.047	0.040	0.046	-	-
5 Years	0.078	0.066	0.058	0.048	0.057	-	-
Return to Schooling	0.074	0.074	0.081	0.087	0.077	0.108	0.111
with Azubi-Status Control	0.071	0.069	0.074	0.079	0.071	-	-
R2 From Linear Model	0.73	0.80	0.85	0.88	0.86	-	-

Notes: The table shows average annual returns to experience computer from a quartic function in experience estimated within a standard Mincer model. Other regressors are years of schooling, dummies for female and for foreign, and, as noted, a dummy for whether an individual is currently an apprentice. The schooling and experience variables both change depending on how apprenticeships are counted. The R2 in the last row is from a regression of degree-effects on the assigned years of schooling, weighted by the inverse of the inverse variance of the effects. The degree-effects and their variance are obtained from a regression of log wages on degree-dummies, a quartic in potential labor market experience, a female-dummy and a foreign-dummy. The Residual Sum of Squares from that regression is a chi2-test statistic for specification test with N-K degrees of freedom. For neither model can linearity be rejected at any relevant significance level. The return to schooling estimate published in Krueger and Pischke (1995) is .077 (.002). They assign two years of schooling for a completed apprenticeship, but have a more detailed assignment of length of schooling among

Appendix Table 5: Different Measures of Job Mobility: France vs. Germany

Age	Germany					France		
	Self-Reported, All Workers	Defined By Tenure, All Workers	Self-Reported without Self- Employed, Public Servants, and Military	Self-Reported without Self- Employed, etc, Full-Time and Wage Restriction	IABS, All Workers	IABS with Full Time and Wage Restriction	All Workers	Without Self- Employed, etc, Full-Time and Wage Restriction
18	0.14	0.53	0.15	0.07	0.14	0.05		0.11
19	0.14	0.36	0.14	0.10	0.14	0.08		0.29
20	0.19	0.36	0.16	0.15	0.15	0.13		0.33
21	0.25	0.40	0.18	0.22	0.18	0.20		0.26
22	0.23	0.34	0.20	0.22	0.20	0.20		0.23
23	0.18	0.25	0.17	0.19	0.17	0.18		0.23
24	0.19	0.24	0.17	0.19	0.17	0.18		0.16
25	0.18	0.22	0.17	0.18	0.17	0.16	0.14	0.14
26	0.15	0.18	0.14	0.15	0.15	0.14	0.11	0.10
27	0.15	0.19	0.15	0.15	0.15	0.14	0.11	0.12
28	0.14	0.17	0.14	0.14	0.14	0.13	0.10	0.09
29	0.12	0.15	0.12	0.13	0.13	0.13	0.07	0.07
30	0.12	0.15	0.12	0.13	0.13	0.12	0.08	0.08
31	0.12	0.15	0.11	0.11	0.12	0.11	0.07	0.07
32	0.11	0.14	0.12	0.12	0.11	0.11	0.06	0.06
33	0.09	0.13	0.10	0.10	0.10	0.10	0.06	0.06
34	0.10	0.13	0.11	0.11	0.10	0.10	0.06	0.06
35	0.09	0.11	0.09	0.09	0.10	0.09	0.05	0.05

Notes: The Numbers in table are fraction of workers employed in two adjacent years who change establishment. Samples are from 1996 Mikrozensus and 1995 IABS for Germany, and 1991-1995 Enquete for France. The measure is self-reported in the Mikrozensus and derived from changes in establishment identifiers in the IABS. The measure for the Enquete Emploi is derived using job tenure, and so is one measure for the Mikrozensus. See the text for further definition and discussion of the measures.

Figure 1A: Unemployment Rates in Early 1990s

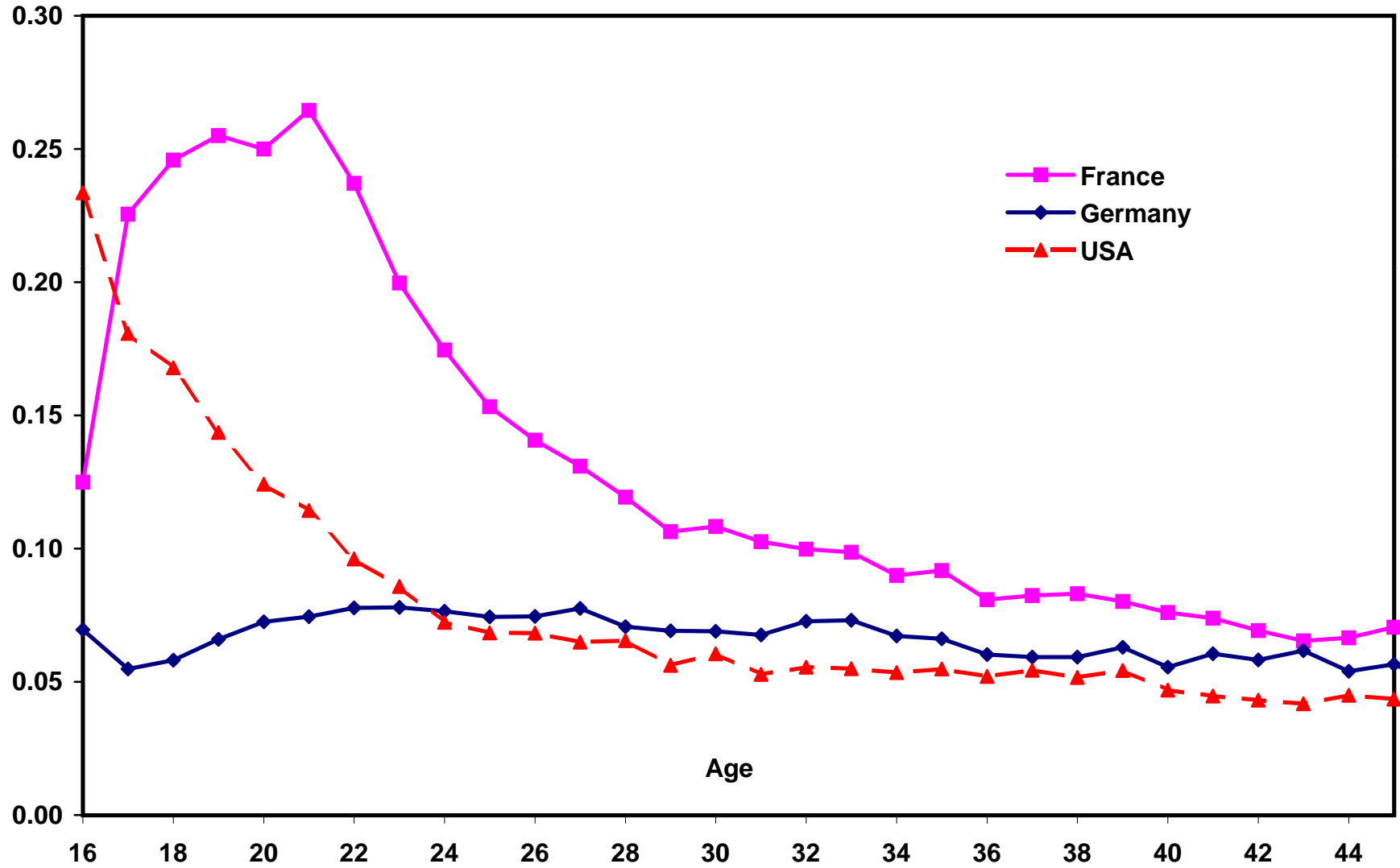


Figure 1B: Employment-Population Ratio Early 1990s

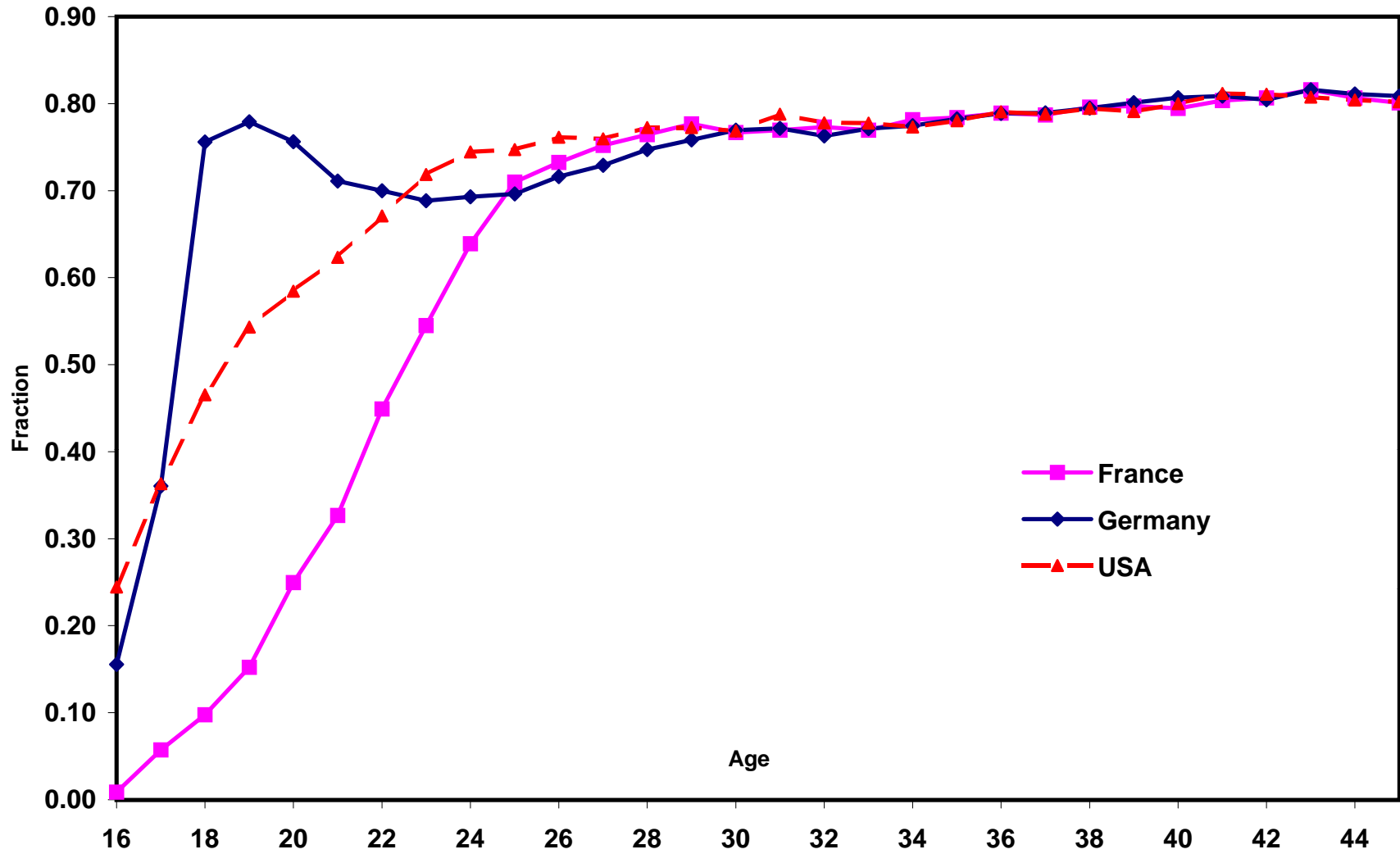


Figure 2A: Unemployment Rates by Education Group and Age

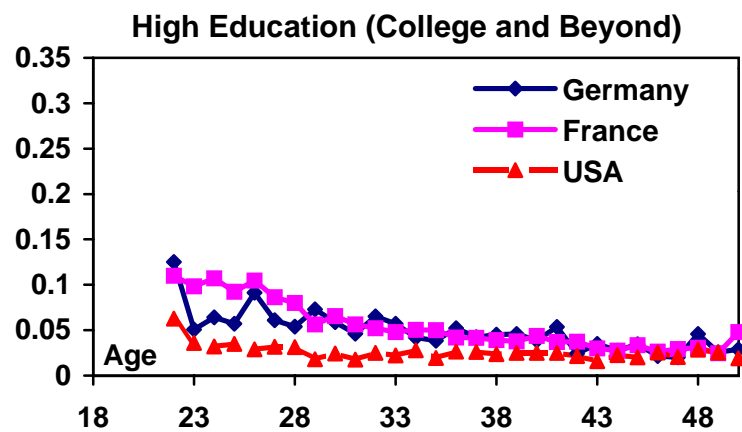
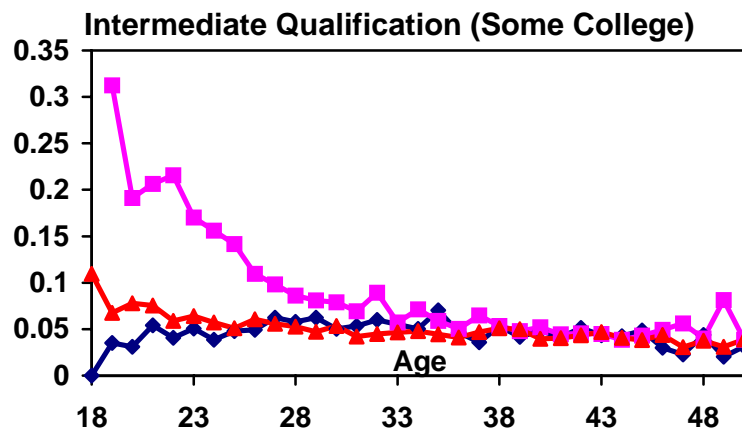
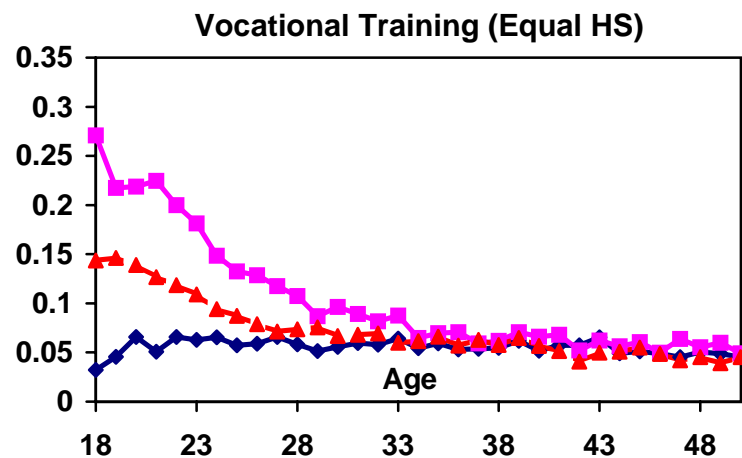
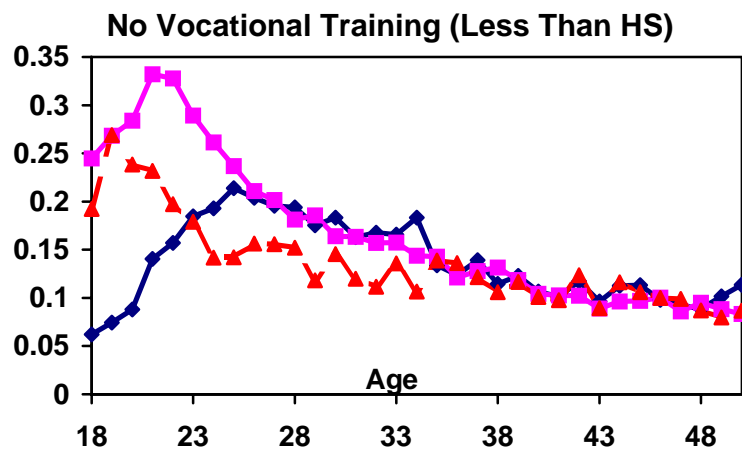


Figure 2B: Fraction of Population Employed By Age and Education Group

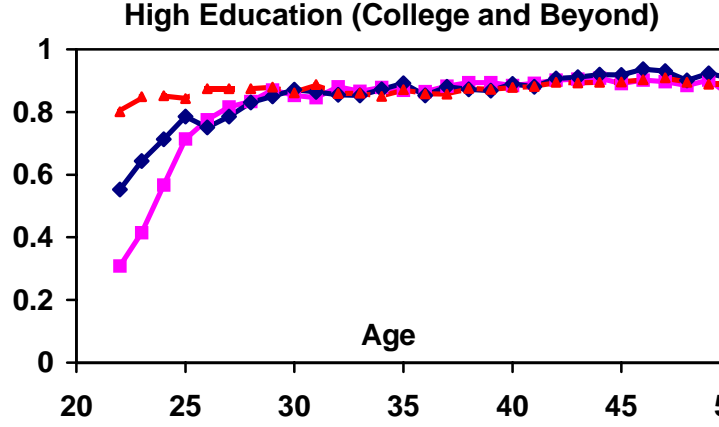
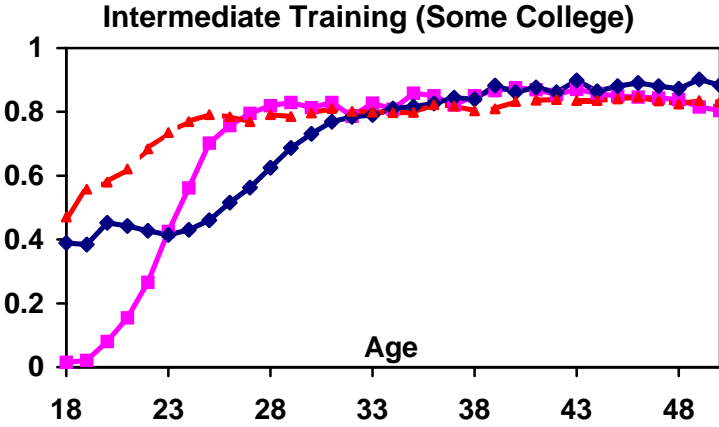
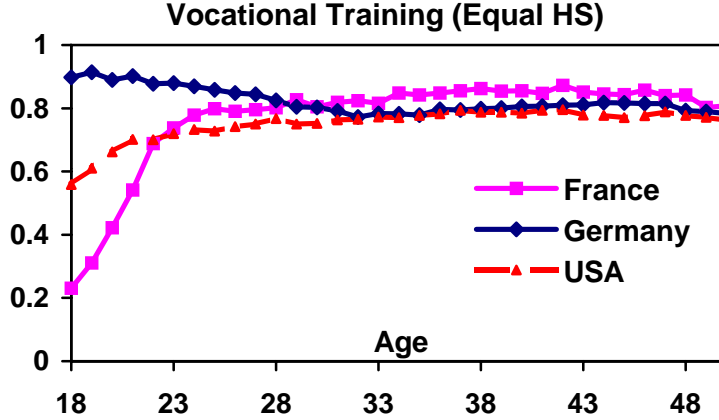
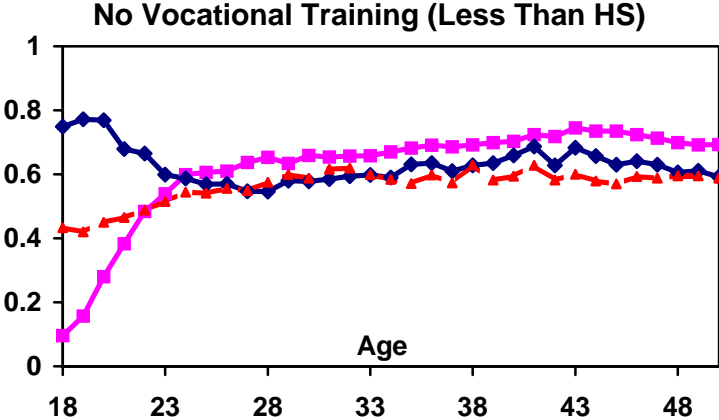


Figure 3A: Log Real Wage Levels by Potential Experience

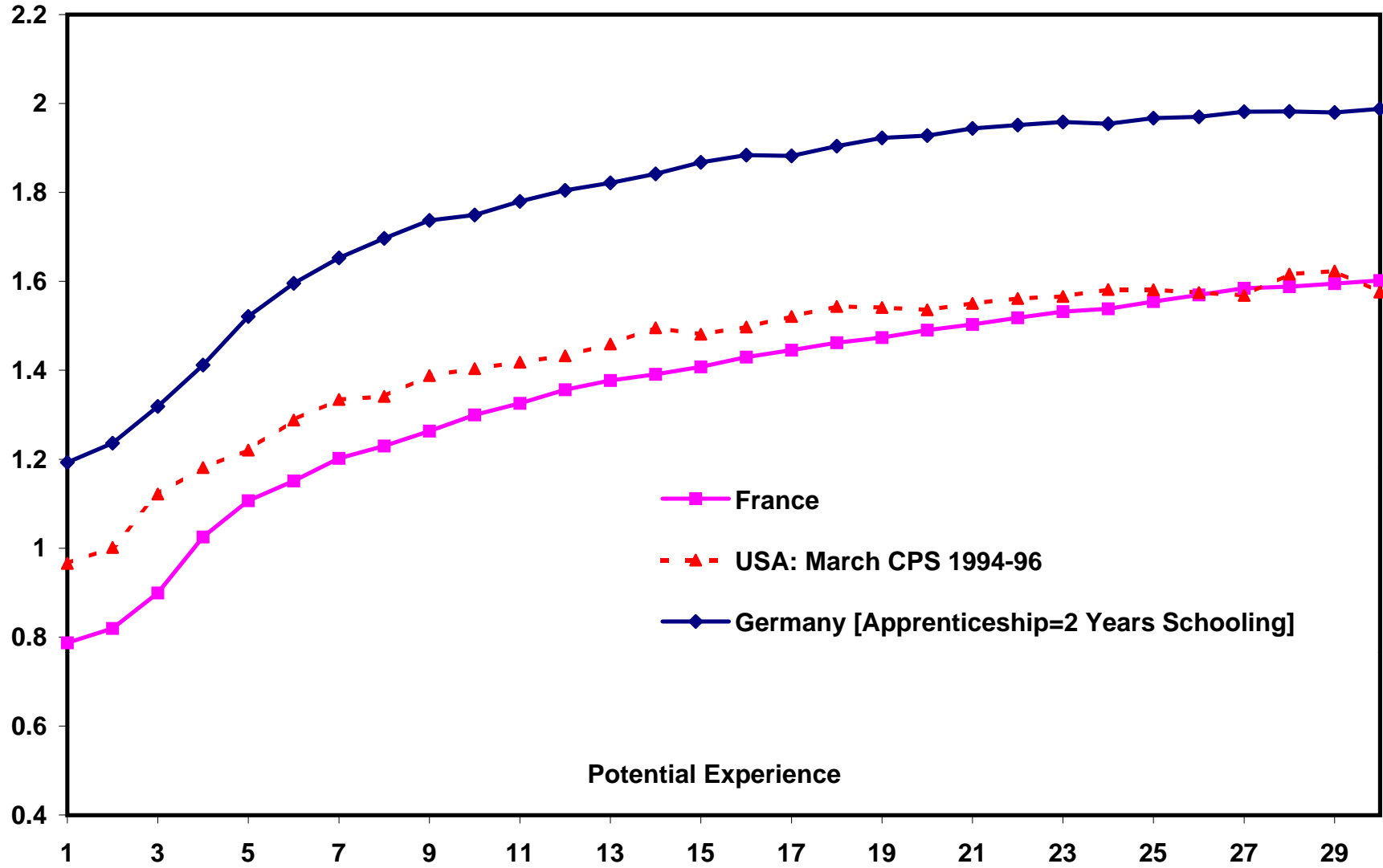


Figure 3B: Cumulated Wage Changes with Potential Labor Market Experience

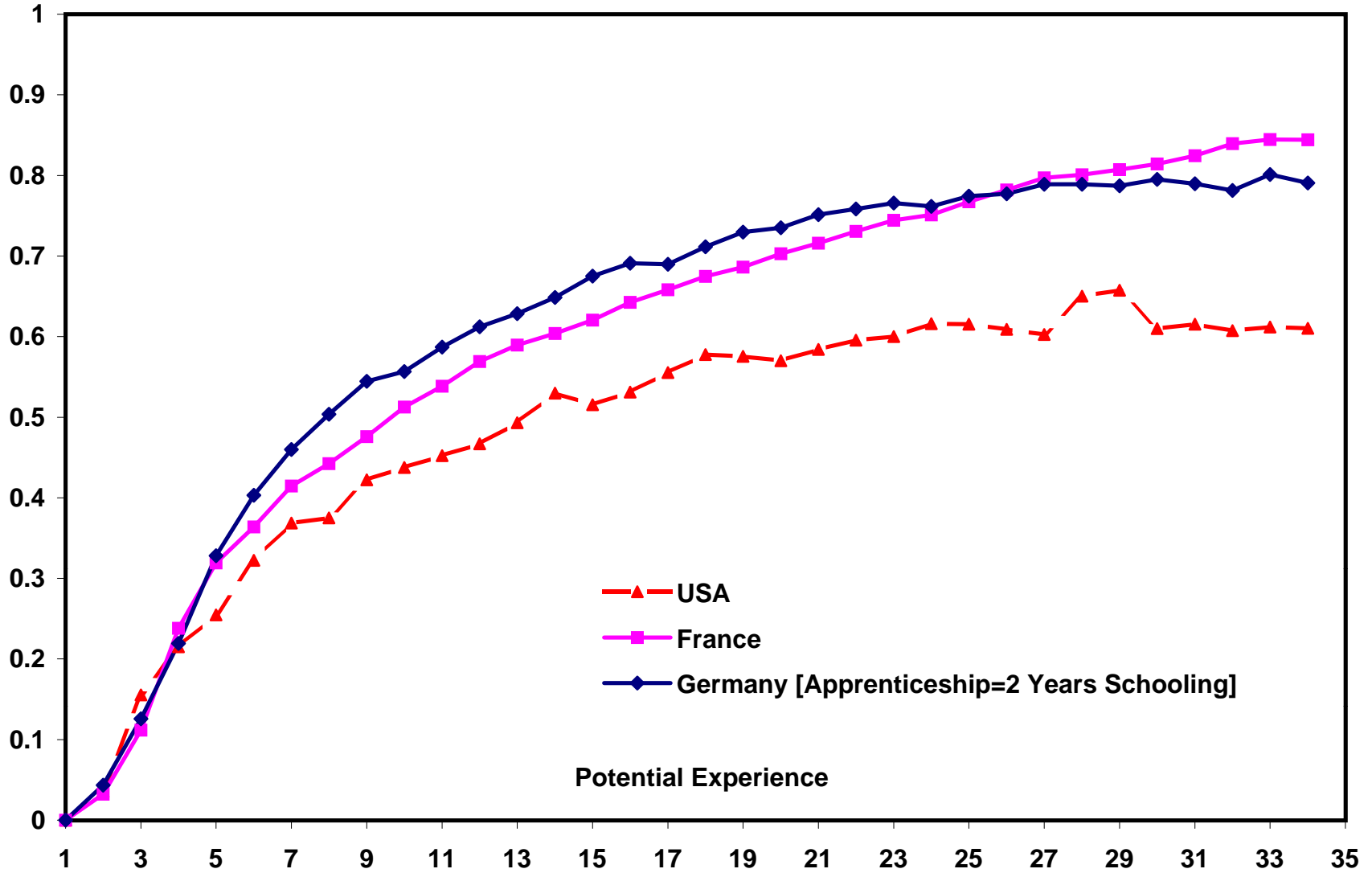


Figure 4: Wage-Experience Profiles By Education

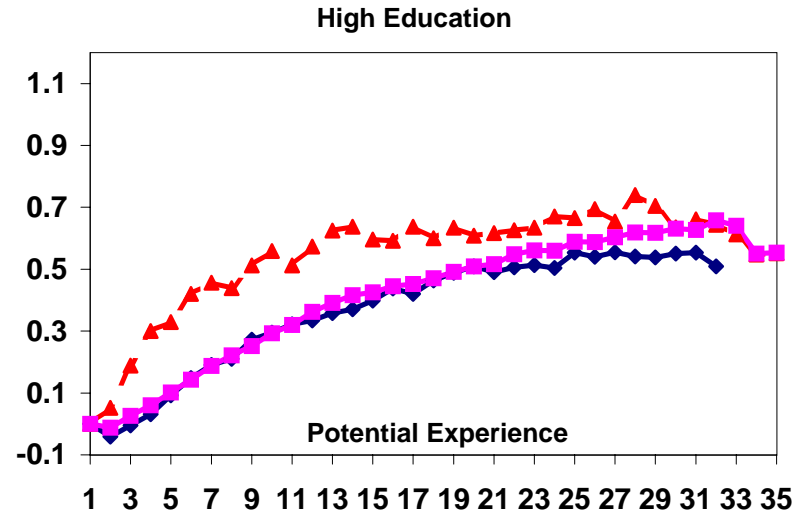
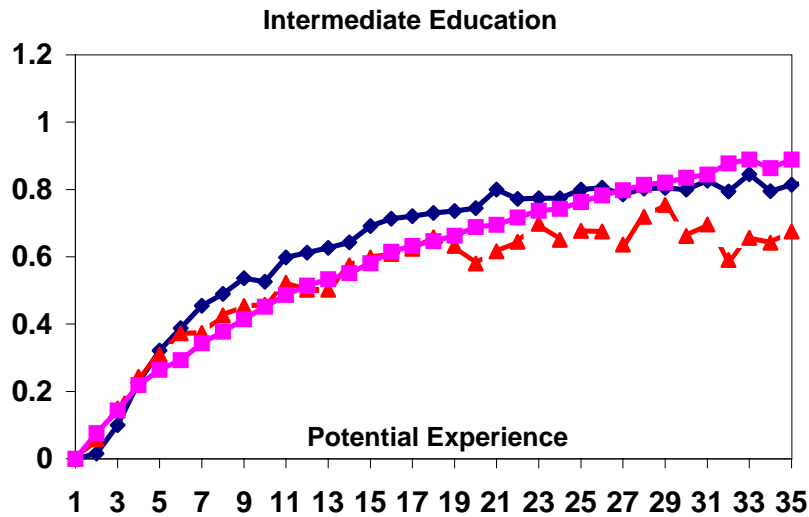
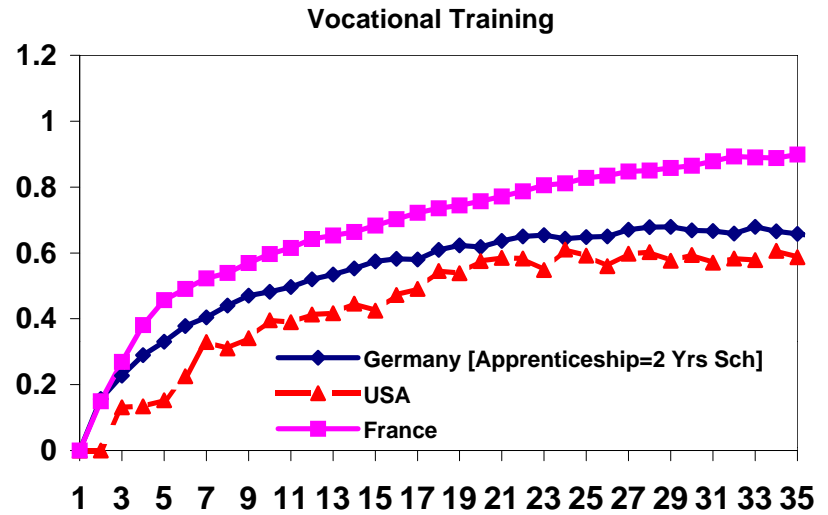
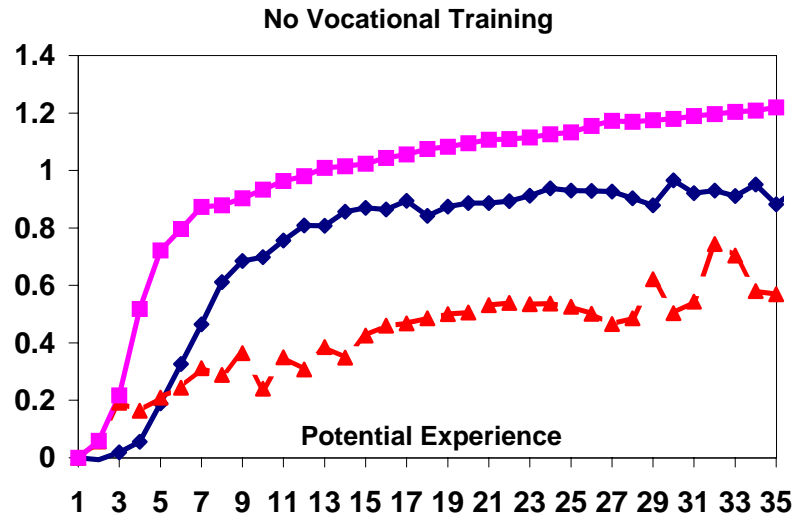


Figure 5: Job Mobility Across Countries, Fixed Term Contracts

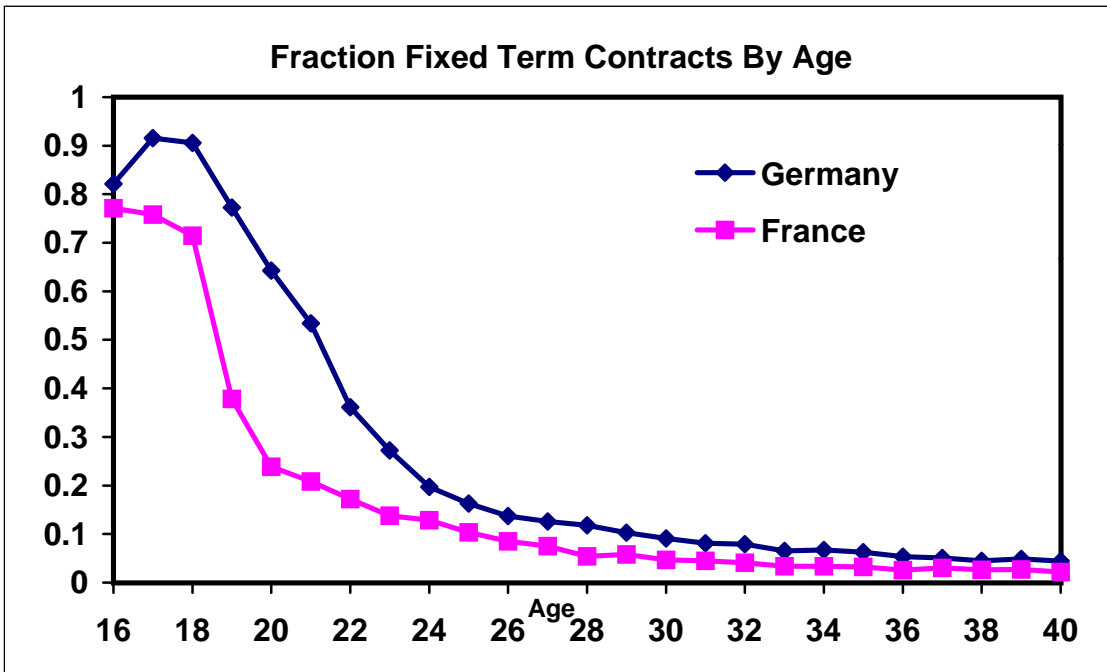
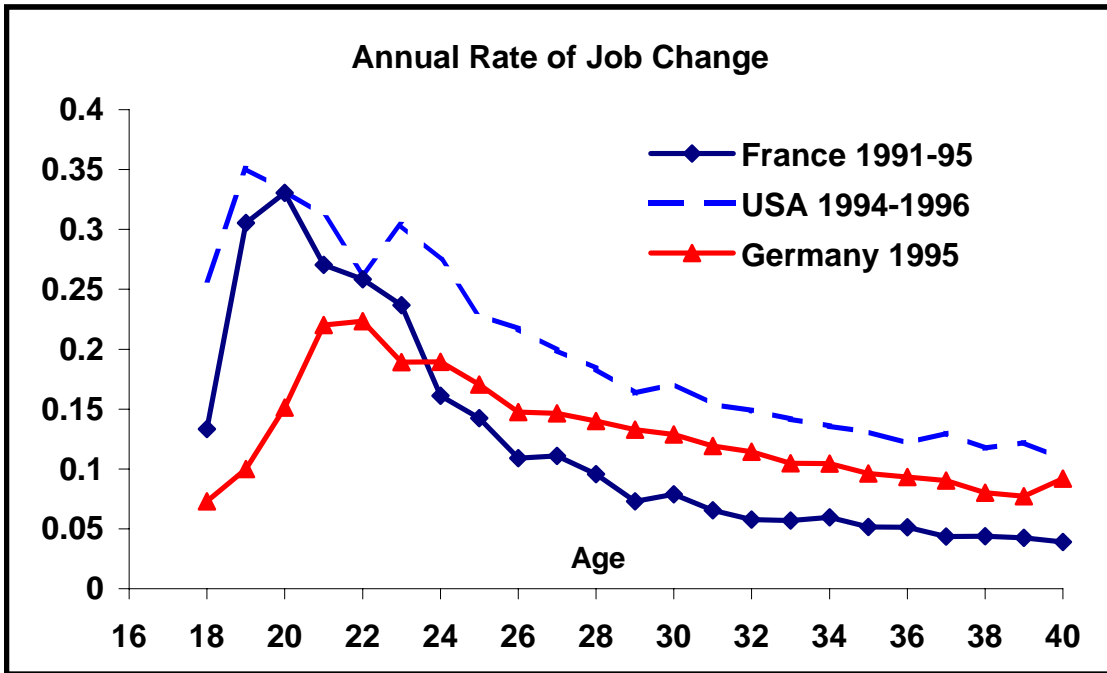
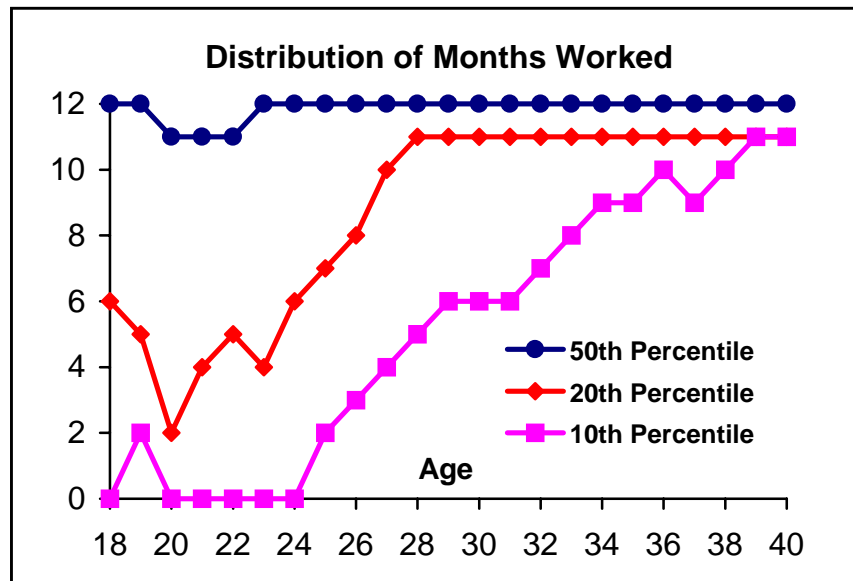
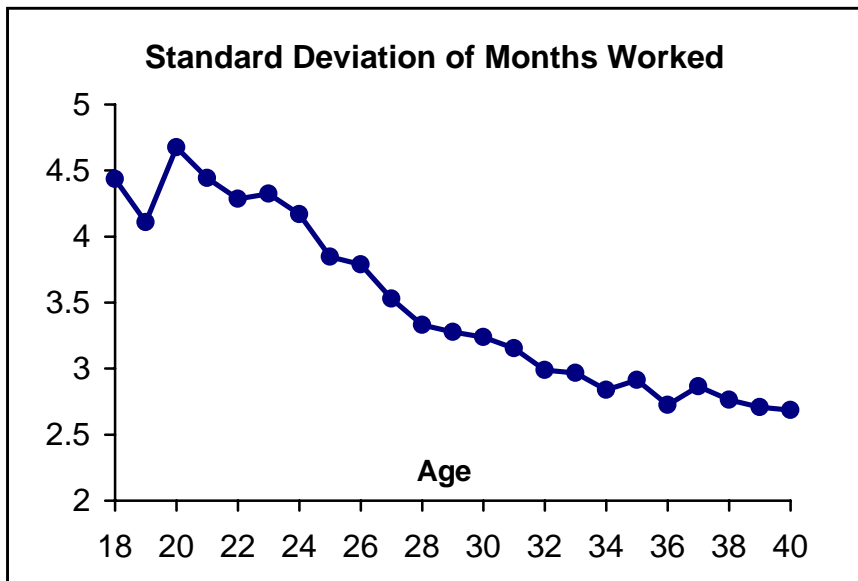
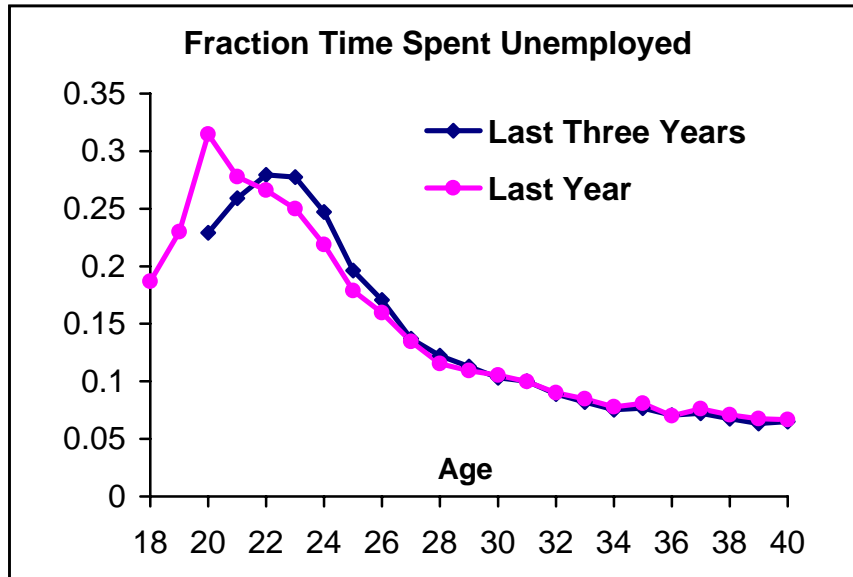
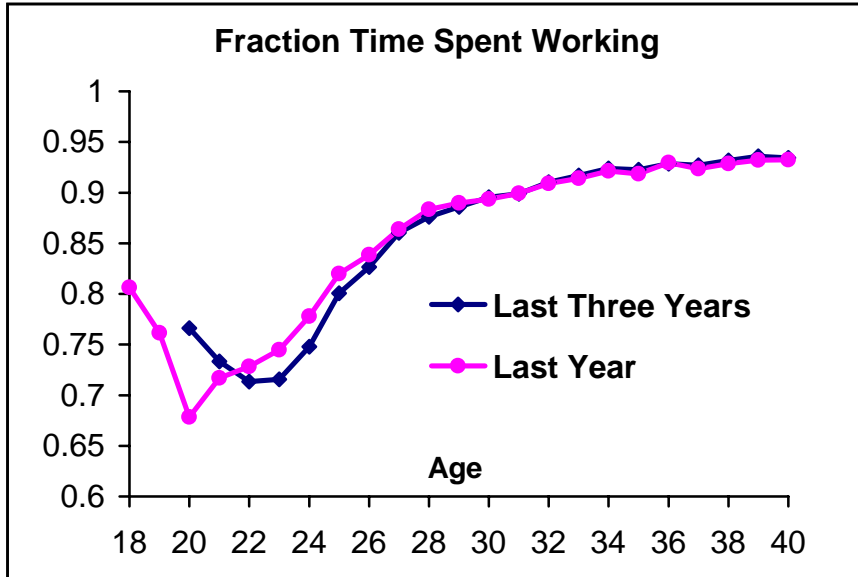
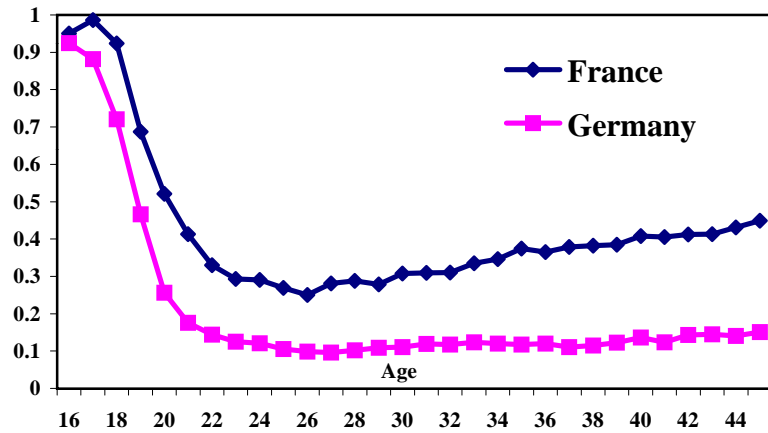


Figure 6: Actual Labor Force Experience By Age in France

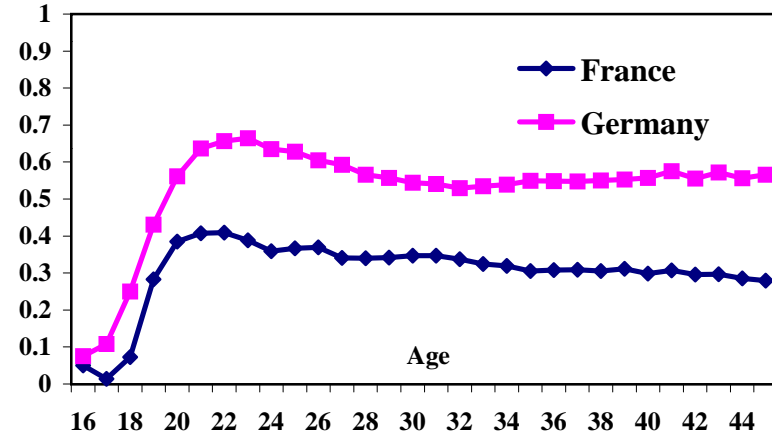


Appendix Figure 1: Fraction Education Groups in Labor Force by Age: France vs. Germany

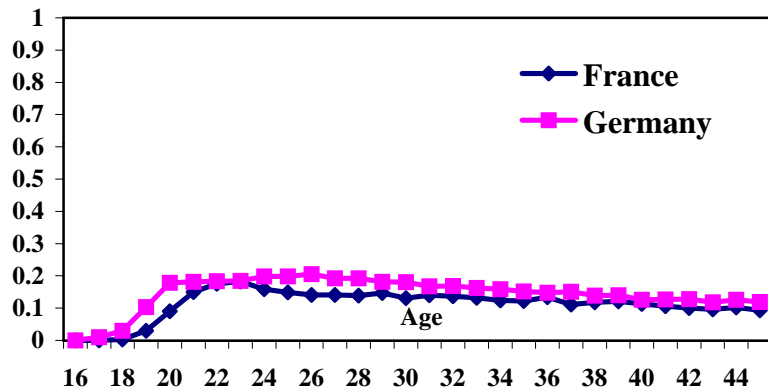
No Vocational



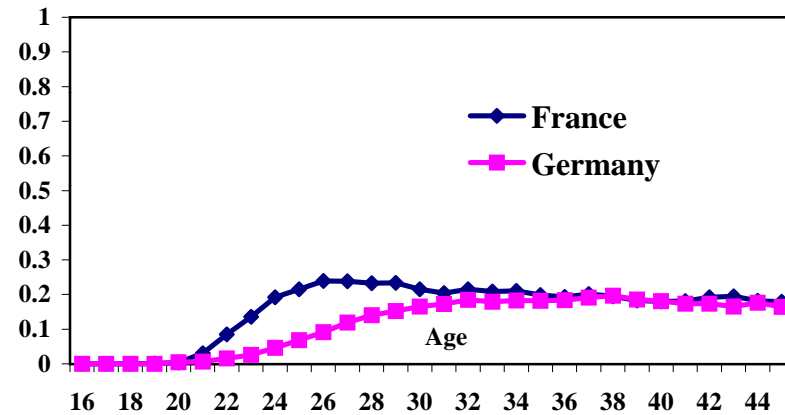
Vocational



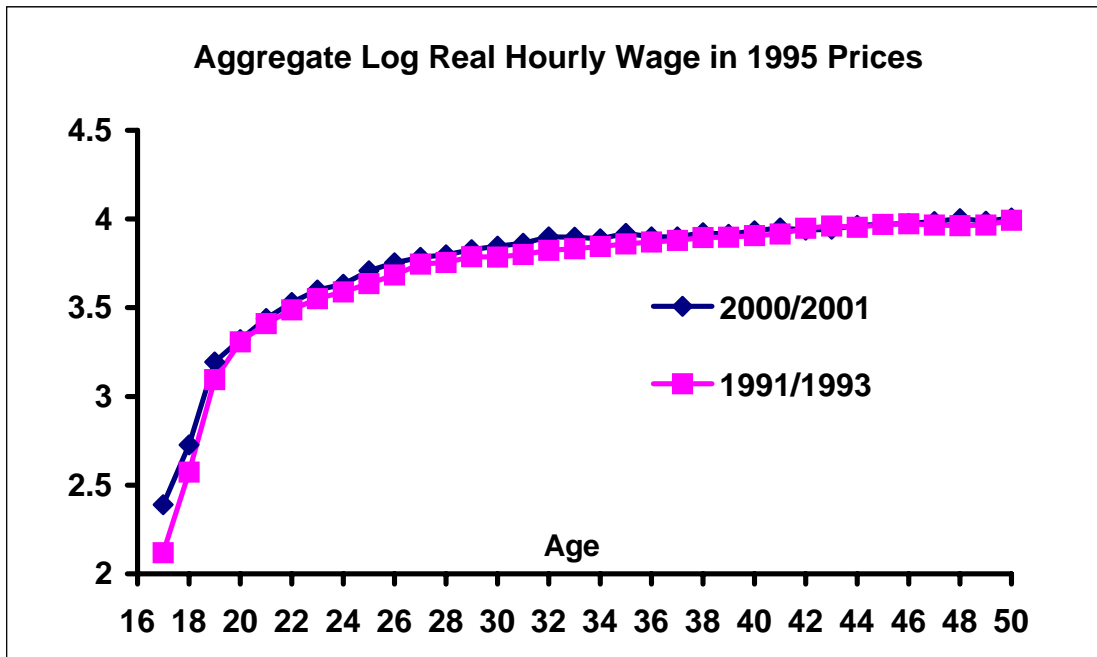
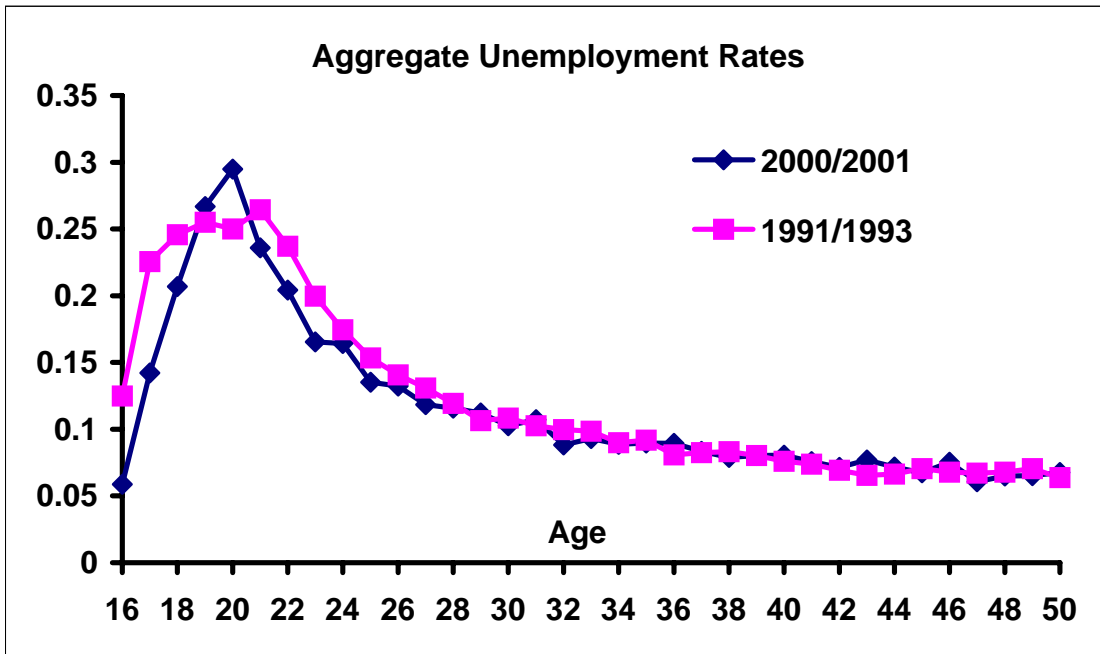
Intermediate Qualification



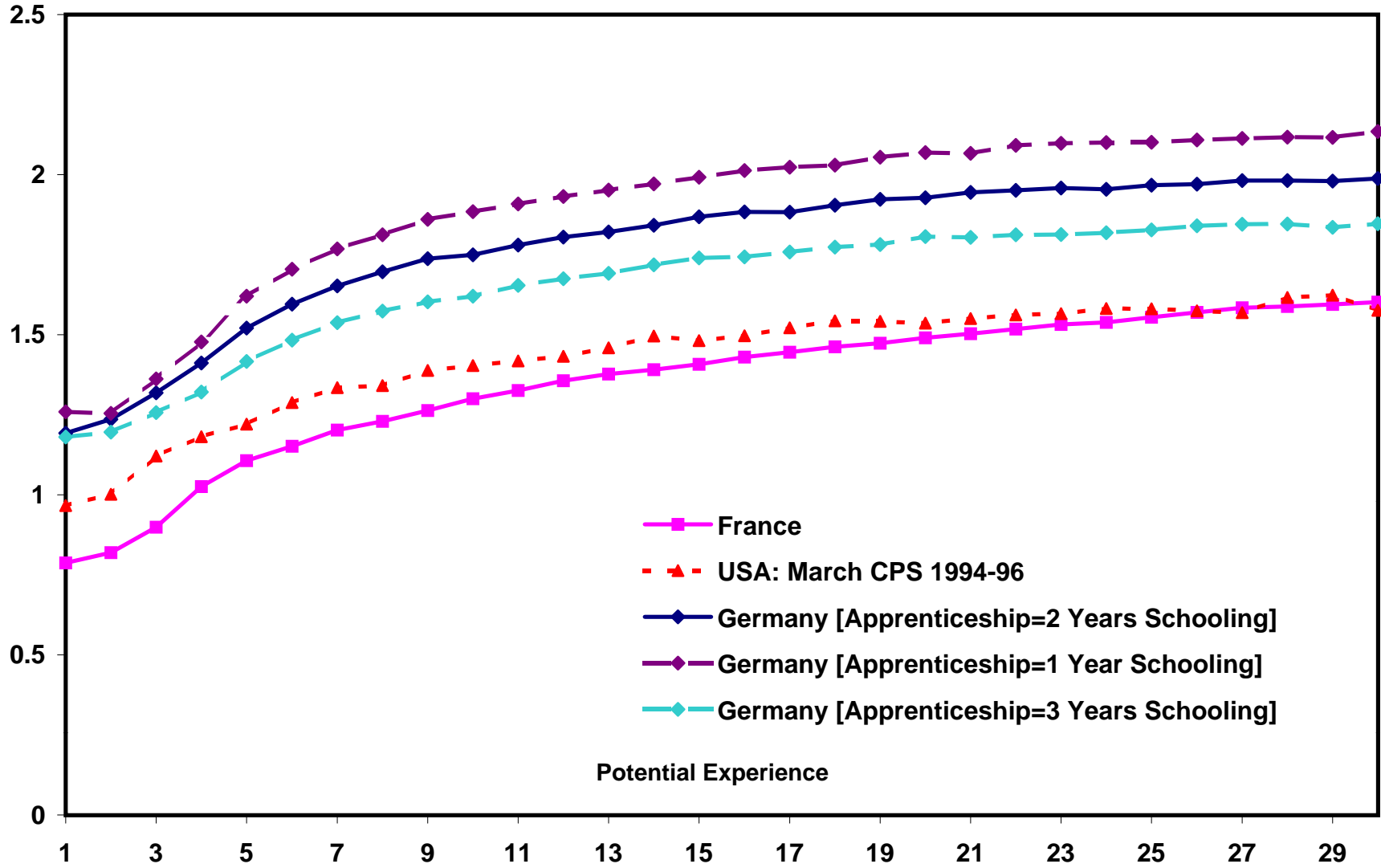
High Education



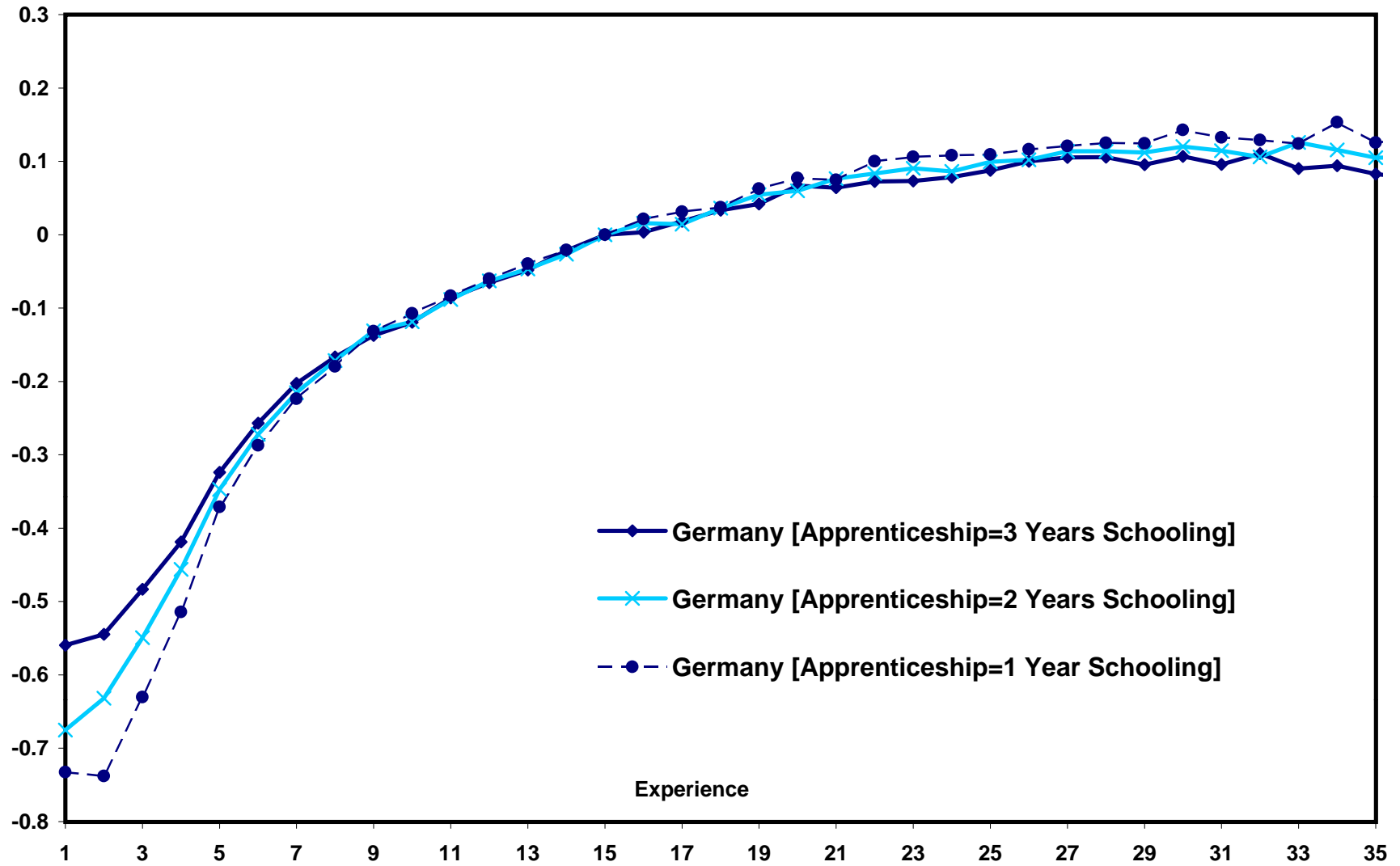
Appendix Figure 2: Unemployment and Wages Over Time France



Appendix Figure 3A: Log Real Wage Levels by Potential Experience

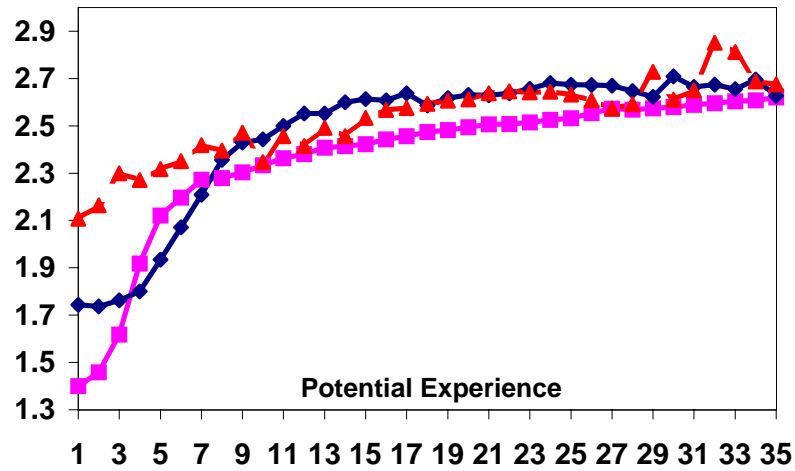


App Figure 3B: Experience Profiles Relative to 15 Years of Experience

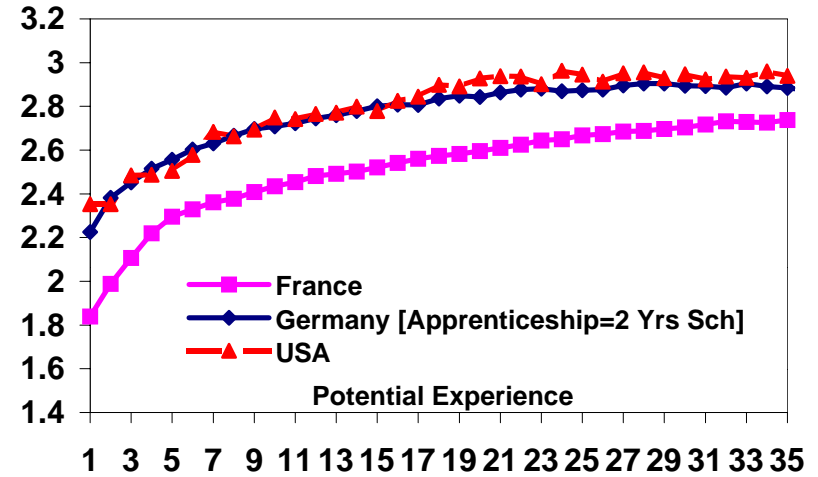


Appendix Figure 4: Wage-Experience Profiles By Education (NEW FIGURE)

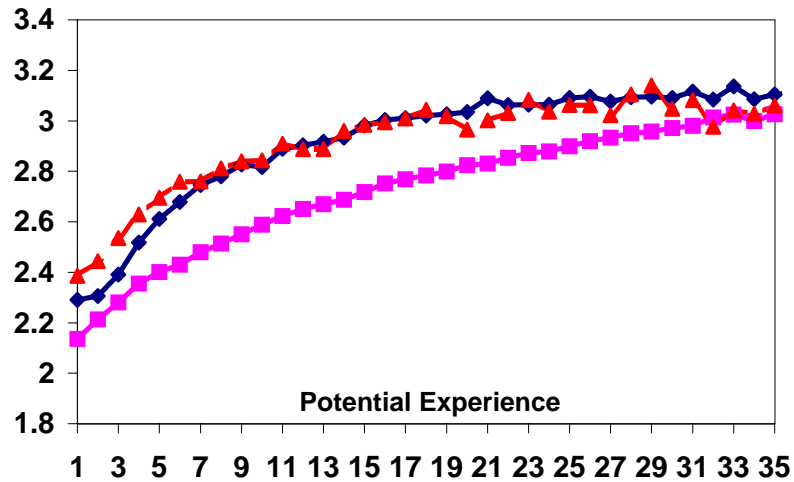
No Vocational Training



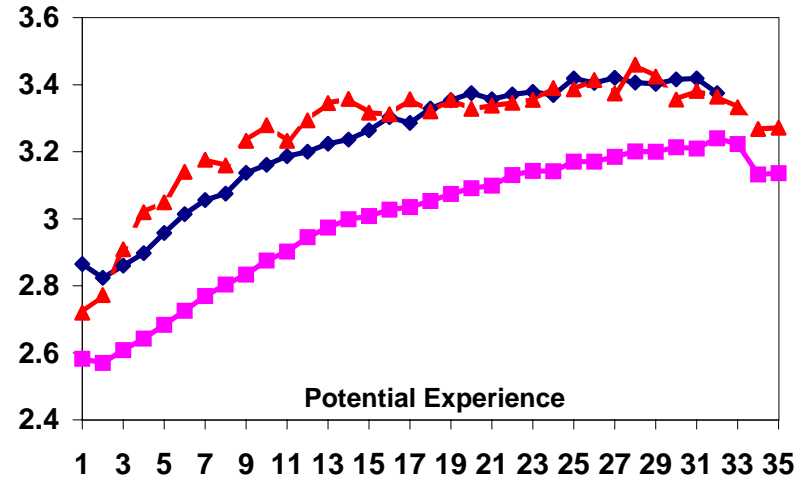
Vocational Training



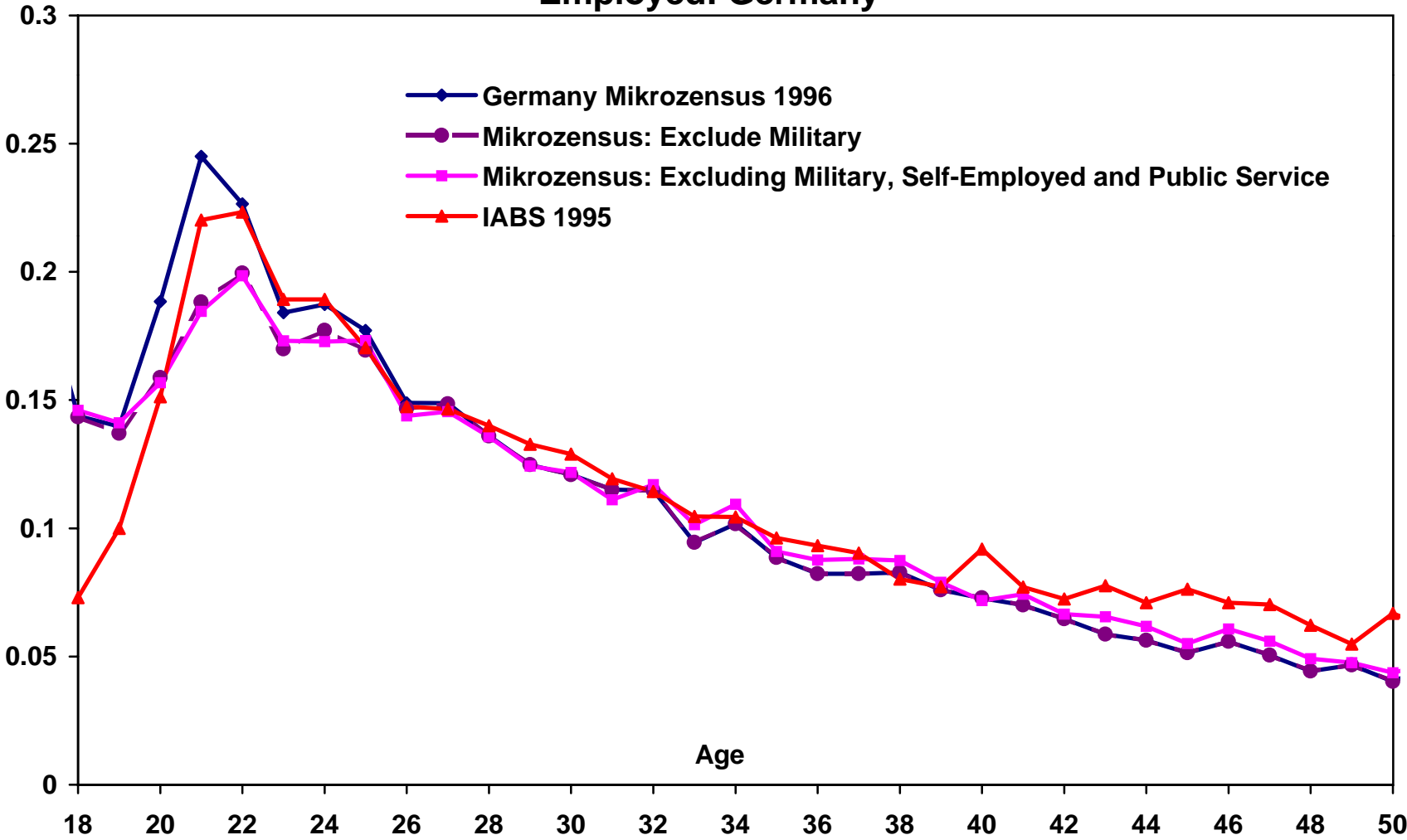
Intermediate Education



High Education



Appendix Figure 5: Annual Job to Job Transitions by Age Among Employed: Germany



Appendix Figure 6: IABS vs. Mikrozensus - Results from Reweighting Procedure

