

Cohort Replacement in Earnings Mobility? – Empirical Evidence from Europe and the United States

Veronika V. Eberharter

Department of Economics, University of Innsbruck, Austria

Abstract : *Based on representative longitudinal data (CNEF 1980-2013) the paper analyzes the level and the determinants of earnings dynamics for different cohorts of female and male employees in Germany, Great Britain, and the United States. Notwithstanding country differences concerning the existing institutional settings of the labor markets, educational systems, and family role models the empirical results show decreasing earnings mobility in the work history. Earnings mobility in Germany and Great Britain is significantly higher than in the United States. Initial wage, education, occupational choice, career stage, birth cohort, and the economic condition continue to influence earnings mobility. The empirical results partly corroborate the cohort replacement hypothesis for female employees in Germany. Gender differentials of earnings mobility origin at the beginning of the work career and continue to contribute to persistent gender differences in economic and social status.*

Key words: *earnings mobility, occupational choice, personal income distribution, wage differentials, wage level and structure*

I. Introduction

The structural change of the macroeconomic indicators, the institutional settings of the labor markets, and the relative demand for skills count among the explanations of the increasing inequality of the earnings distributions in many industrialized countries since the 1990ies. Technological and demographic change reinforce job polarization and the heterogeneity of employees concerning age, gender, occupations and industries, and contribute to economic and social stratification [1][2][3][4][5][6][7][8][9][10][11].

The extent to which individuals change their relative position in the distribution of social and economic status over time denotes the inter-temporal persistence of inequality. The degree of earnings mobility is an indicator of the equality of opportunity in a society and the flexibility of the labor market [12][13][14]. Notwithstanding significantly differing concerning welfare state regime and labor market institutions, the United Kingdom, the United States, Germany, France, and the Scandinavian countries show similar earnings mobility patterns since the 1970ies [15][16]. Earnings inequality and income mobility are negatively correlated, earnings mobility declines with increasing earnings inequality [17][18][9]. Short-run mobility is rather stable [10], wage mobility is greater over longer time periods. Structural shifts of earnings dynamics are traced back to the change of political (German unification) or macroeconomic conditions [19]. Earnings mobility is determined early in career and varies with the initial position in the earnings distribution [20][21][22][23]. Employees starting with relatively low earnings, improve their relative position in the earnings distribution through experience and training [24]. The extent of wage growth varies dramatically at the lower tail of the wage distribution, the type of the initial job, the propensity to change employers, as well as occupation and industry [25][26]. Men experience higher labor market income mobility, women's upward mobility is higher in the lower tail of the income distribution, whereas men's income mobility is higher at the upper tail of the income distribution [17][27].

The paper contributes to the literature in analyzing gender differences concerning the level of earnings mobility and the influence of individual and family background characteristics, and employment related attributes, as well as macroeconomic conditions on earnings dynamics. The paper tests the cohort replacement hypothesis, that gender differences of earnings mobility are decreasing for younger birth cohorts. According to the cohort replacement hypothesis younger cohorts of women are better educated, they acquire more work experience, and they accumulate more human capital. In many industrialized countries the labor market participation and work experience increased particularly for younger women, the educational qualifications have equalized among young men and women, and occupational choices tend to be more similar. Additionally, traditional role models get less influential, and improved institutional child care arrangements lead to a harmonization of labor market behavior of women and men. Due to the more continuous work histories, women are 'catching up' and the gender gap in earnings mobility declines [28][10]. This suggests that human capital characteristics as education and experience are fading out as explanations of gender heterogeneity of earnings mobility for younger cohorts of employees.

We focus on the situation in Germany, Great Britain, and the United States, differing concerning macroeconomic conditions, the existing welfare state regime, constituting the educational system, the institutional labor market settings, the social security system, and the maternity leave and child care arrangements [29] which are supposed to influence earnings mobility. The liberal welfare state regime in Great Britain and the United States is characterized by a strong individualistic self-reliance. The public philosophy is grounded on the idea of opportunity reflecting individual efforts, which indicates an open, liberal and dynamic social system. The labor market is flexible, the labor market policies offer less protection for workers, and do little to ameliorate market-based risks and incentives. The conservative-corporatist welfare state regime in Germany is typified by a modest level of decommmodification. Government policies ensure against market-based risks and protect those who are unable to succeed in the market place, but partly preserve traditional role models. The labor market institutions and labor market policies ensure employment stability. Family policies facilitate the incorporation of women into the labor force (e.g. child care, paid maternity leave, job return guarantees) and support the transition from the traditional male bread-winner model to the adult worker model. Due to the relatively strongly regulated labor markets and sticky wages we expect lower wage mobility in Germany than in the United States and Great Britain [30][31].

We observe the earnings profiles of five age cohorts of female and male employees (born in the years 1950-1954, 1955-1959, 1960-1964, 1965-1969, and 1970-1974) in different career stages defined by age (25-39, 30-34, 35-39, 40-44, 45-49, 50-54 years). The focus on earnings profiles confirms the importance of controlling for age composition of the labor force when observing the mechanisms of wage mobility in the work-life cycle. To evaluate the level of earnings mobility we focus on the wage elasticity, which measures the degree of the persistence of the relative earnings position [12][32][33][34][35]. Additionally, we employ mobility measures based on the decile transition matrix of real hourly earnings (2010=100) at the beginning (t) and the end of the career stages (t+k). We analyze the determinants of upward earnings mobility of female and male employees using a binomial logit model, which allows a dynamic interpretation of gender inequalities. The paper is organized as follows. Section 2 provides the theoretical background, section 3 presents a description of the data bases. In section 4 the methodology used is described. Section 5 discusses the empirical results, and section 6 concludes with a summary of findings and future prospects for economic and social policy.

II. Theoretical Background

The structuring impact of economic and social stratification on the change of the relative earnings position in the work-life is widely discussed in contemporary research and social policy [36]. The neoclassical labor market theory provides a broad range to explain heterogeneous earnings and earnings mobility focusing on a set of individual socio-economic and family oriented characteristics, employment related attributes, employer respectively firm related features, and aggregate economic indicators as well as the change of these characteristics in the work-life [26].

According to the neoclassical approach wage differentials originate in early career [37][38][39][22][20]. Experience can lead to wage growth because workers may receive job-specific skills making them more productive, or they achieve general skills that guarantee greater earnings potential with the current employer or to move to an employer who can make better use of the newly acquired skills and with higher pay. The influence of occupational choice on wage mobility is discussed ambiguous: staying in the same occupation implies a higher potential of experience and therefore a higher probability of wage growth. At the other hand, occupational change can increase human capital accumulation, which may be rewarded by a wage increase, to stay in the same occupation may be penalized [26]. Further determinants influencing wage mobility are employment shifts between industries and occupations, e.g. the change from stable to instable industries or occupations [40], or the volatility of firm performance [41]. Additionally, technological progress, the dominance of skill biased technological change, and specialization makes it difficult to transfer skill specific human capital to different employments and jobs over time [42][43] which may affect wage mobility. Aggregated changes in the job stability, due to the change in unionization and wage compression may influence wage inequality [5] and wage mobility [40]. The inverse relation between strong labor market institutions, as collective bargaining, unionization, employment protection, minimum wages and wage mobility is well established in economics [44]. Labor market institutions protect employment and wages of the insiders at the cost of the outsiders (unemployed and inactive). In countries with weak labor market institutions (US, UK) the volatility of wages helps to avoid unemployment in recession, in continental Europe strong labor market institutions induce sticky wages and unemployment. Finally, aggregate economic indicators may affect wage mobility, e.g. regional unemployment rates, GDP growth, shifts in employment structures, eg. share of self-employed [41][45].

Potential gender differentials in earnings and earnings mobility are related to career opportunities and career paths. The neoclassical approach suggests that women decide their labor market behavior by a utility maximizing allocation of time between household and workplace activities. Women's labor market decisions bear in mind to leave the labor market for a time and incur lower depreciation rates for time out of work.

Anticipating interruptions in their work life history, women invest less in education, and choose occupations, and career paths that require lower human capital intensity [46][47][48][49][50][51][52][22][28]. Gender pay differentials are expected to result due to the fact that men accumulate more characteristics that are rewarded in the labor market, whereas women accumulate characteristics that are rewarded outside the labor market. Women carry out care within the home, and family responsibilities, motherhood are indicators for women's higher engagement in domestic work, whereas men have more continuous careers. Occupational segregation counts among the prominent explanations of gender earnings differentials. Women are concentrated in female dominated occupations and low-wage sectors. The exclusion of women from entering certain occupations by cultural practices and institutional barriers [52] contributes to persistent occupational segregation [53], and slower career progression of female employees [54]. Occupational choice and employer's gendered expectations indicate the social norms which indirectly underpin occupational segregation and internal career paths. If employers expect women to interrupt their work career they will be less willing to invest in their training [55]. Another explanation is that women and men have the same characteristics, but men's are higher rewarded in the labor market.

III. Data

The empirical analysis is based on data from the German Socio-Economic Panel (SOEP), the British Household Panel Survey (BHPS), and the US Panel Study of Income Dynamics (PSID), which were made available to us by the Cross-National Equivalent File (CNEF) project at the College of Human Ecology at Cornell University, Ithaca, N.Y..¹ The PSID started in 1980 and contains a nationally representative unbalanced panel of about 40,000 individuals in the United States. From 1997 on the PSID data are available bi-yearly. The GSOEP started in 1984 and contains a representative sample of about 29,000 German individuals that includes households in the former East Germany since 1990. The BHSP started in 1991. The first wave consists of some 5,500 households and 10,300 individuals drawn from 250 areas of Great Britain. Additional samples of 1,500 households in each of Scotland and Wales were added in 1999, and in 2001 a sample of 2,000 households was added in Northern Ireland, making the panel suitable for UK-wide research. The surveys track the socioeconomic variables of a given household, and each household member is asked detailed questions about age, gender, marital status, educational level, labor market participation, working hours, employment status, occupational position, economic situation of the members of a given family over time, as well as household size and composition. The income variables are measured on an annual basis and refer to the prior calendar year. The data allow monitoring the employment and occupational status, the earnings situation, and the socio-economic characteristics of the individuals.

The sample design defines five cohorts of employees, born in the years 1950-1954, 1955-1959, 1960-1964, 1965-1969, and 1970-1974. The analysis focuses on persons who have already completed their schooling, and are most likely not affected by early retirement. We observe the earnings profiles of these employees in characteristic career stages, that is when they are aged 25-29, 30-34, 35-39, 40-44, 45-49, respectively 50-54 years. We thus have partial coverage for the more recent cohorts, and for the earlier cohorts who retire out of the sample at the age of 54 years.

IV. Methodology

Our main economic variable is total income from paid work. This is the total personal gross labor income (before deduction of taxes and social security contributions) divided by employment hours in the reference year being the year prior to the survey. All earnings are put into 2010 CPI-adjusted currencies. We observe the earnings at the begin (t) and at the end ($t+k$) of a career stage of an employee. To exclude the influence of transitory shocks and cross-section measurement errors the real wages (2010=100) are averaged for three years at the beginning (t) and at the end ($t+k$) of different career stages.

4.1. Mobility measures

The slope coefficient from a regression of the earnings variable in observation period $t+k$ on the earnings variable in observation period t $\ln(w_{i,t+k}) = \beta_0 + \beta_1 \ln(w_{i,t}) + u_{i,t+k}$ is one of the simplest mobility measures [12][33][34][35]. The coefficient β_1 expresses the elasticity of the earnings variable in $t+k$ with respect to the earnings level in period t . The larger β_1 the more likely an employee will inhabit the same income position in period $t+k$ as in period t , which implies a greater persistence of the relative earnings position. The closer to zero β_1 , the greater the wage mobility.

¹ For a detailed description of the data bases see [56].

To obtain a detailed description of the mobility process [32] we employ mobility measures based on the mobility matrices derived from cross-tabulations of the relative position in the earnings distribution at the period t+k against the relative position in the earnings distribution at the period t for all cohorts of employees and career stages. The Prais index [57] [58] takes the form $M_{PB} = 1 - \left(\frac{tr(P)}{n} \right)$, with $tr(P)$ denotes the trace of the transition matrix, that is the sum of the stayers on the main diagonal, and n the number of the individuals. The value of $M_{PB} \in (0,1)$ increases with the increasing number of movers. The index does not weight the movements, so movements of one or three deciles are weighted identically. The Bartholomew index [59][60] expresses earnings mobility in terms of average income boundaries crossed over the observation period. The index sums up the moves across the earnings classes, i.e. outside the main diagonal $M_B = \frac{1}{m} \sum_{i=1}^m \sum_{j=1}^m |i - j| p_{ij}$, with p_{ij} the proportion of employees in earnings decile j in period t+k who were in earnings decile i in period t. The further the distance between the actual and the former earnings decile the greater the weight assigned to it. In the case of no mobility the Bartholomew index takes the value zero.

4.2. Determinants of upward earnings mobility

We employ a binomial logit model to evaluate the determinants of upward earnings mobility (mob=1), that is if the person experiences an improvement of her relative position in the wage distribution in a career

stage. The probability of upward mobility is estimated to be $Pr_{ob}(mob = 1) = \frac{e^Z}{1 + e^Z}$, whereby Z is the

linear combination $Z = B_0 + B_1X_1 + B_2X_2 + \dots + B_nX_n$ with $X_i=1,\dots,n$ as independent variables and $B_i=1,\dots,n$ as regression coefficients. In general, a probability is greater than 0.5 indicates that a person has improved her position in the wage distribution, a probability less than 0.5 predicts that the relative wage position did not change, respectively she experiences a downgrade in the relative earnings position. The interpretation of the regression coefficients B_i is based on the odds of wage mobility, that is the ratio of the probability of upward wage mobility to the probability of staying in the same wage decile respectively to experience downward wage

mobility $\left(\frac{Pr_{ob}(mob = 1)}{Pr_{ob}(mob = 0)} \right)$. The logistic equation can be expressed as

$$\frac{Pr_{ob}(mob = 1)}{Pr_{ob}(mob = 0)} = e^{B_0 + B_1X_1 + B_2X_2 + \dots + B_nX_n} = e^{B_0} e^{B_1X_1} e^{B_2X_2} \dots e^{B_nX_n}$$

The $(\exp(B_i))$ indicate the relative risk ratio, and express the factor by which the odds change with a one-unit change in the i-th independent variable.

The vector X_j considers socio-economic variables, family related characteristics, employment related features, and macroeconomic indicators at the beginning of the career stages (t), as well as the change of time-variant socio-economic characteristics within the career stages. We introduce the initial wage level $(\ln(w_{i,t}))$, which is supposed to be negatively correlated with wage mobility. We include the years of education of the individual (EDU) to capture the influence of human capital accumulation on wage mobility. We suppose that higher education positively contributes to wage mobility. We consider the number of children less than 16 years in the household (CHILD) to control for the impact of care responsibilities on wage mobility. To consider the influence of employment related characteristics on earnings mobility we include the individual’s employment status (EMP), the occupational status (OCC) and the firm’s industry (IND). The employment status variable takes the value ‘1 full-time employed’ if a person works 35 hours and more per week on average, and the value ‘2 part-time employed’ if the person works less than 35 hours per week on average. The database provides a 1-digit ISCO-88 (International Standard Classification of Occupations) scheme which is reclassified into 7 categories “1 academic/scientific professions/managers”, “2 professionals/technicians/ associate professionals”, “3 trade/personal services”, “4 agricultural/fishery workers”, “5 craft and related workers”, “6 plant and machine operators/assemblers”, and “7 elementary occupations”. There is a distinctive ranking of the occupational classifications, lower-numbered categories offer a higher prestige and a higher social status. We rearrange the occupational categories into five major groups with 1 "academic/scientific/managerial occupations", 2 "professional occupations", 3 "trade/personal service occupations", 4 "agricultural and fishery workers", and 5 "craftsmen, operators, elementary workers". The 1digit SIC (Standard Industry Classification)

scheme provided by the database is reclassified into 5 industry groups (IND) with 1 "agriculture", 2 "energy/mining", 3 "manufacturing/construction", 4 "trade/transport", and 5 "bank, insurance/services".

To evaluate the influence of the change of time-variant characteristics we include dummy variables capturing the change of the employment status (DIFFEMP), and occupation (DIFFOCC) during the career stages. These variables are the same for all alternatives, but their effects on the earnings mobility are allowed to differ for employees from different birth cohorts in different stages of the employment career. Furthermore, we control for the birth cohort (COHORT) and the actual career stage (CAREER) of an employee. Finally, we introduce the GDP growth rate (GROWTH) at the beginning of a career stage to capture the influence of economic fluctuation on wage mobility. (Table 1)

Table 1: Dependent and independent variables in the binomial logit model

	Variables
mob	wage mobility 1 upward mobility, 0 constant relative position in the wage distribution, or downward mobility
$\ln(w_i)$	natural logarithm of real wage (t) of person i
EDU	education in years (t)
CHILD	number of children (t)
EMP	employment status (t) 1 full-time, 2 part-time
OCC	occupational attainment (t) 1 academic/scientific/managerial occupations 2 professional occupations 3 trade/personal service occupations 4 agricultural/fishery workers 5 craftsmen/operators/elementary workers
IND	industry classification (t) 1 agriculture 2 energy/mining 3 manufacturing/construction 4 trade/transport 5 bank/insurances/service sector
DIFFEMP	change of employment status (t+k;t), 1 $\Delta EMP \neq 0$, 0 else
DIFFOCC	change of occupation (t+k;t), 1 $\Delta OCC \neq 0$, 0 else
CAREER	Career stage [age]: 1[25-29] 2[30-34] 3[35-39] 4[40-44] 5[45-49] 6[50-54]
COHORT	birth cohort [born in the years]: 1[1950-1954] 2[1955-1959] 3[1960-1964] 4[1965-1969] 5[1970-1974]
GROWTH	GDP growth rate (t)

V. Empirical Results

5.1. Earnings Mobility

Male and female employees in Germany and Great Britain experience significantly higher earnings mobility than employees in the United States. In Germany and the United States the earnings elasticity of employees from all birth cohorts increases in the course of their labor market career which indicates decreasing earnings dynamics. In all the countries, gender differences are less expressed in the early career stages of younger birth cohorts which corroborate the cohort replacement hypothesis. Gender differences are more expressed in Germany than in the United States. In Germany, female employees experienced higher wage mobility than male employees. Significant gender differences occur at the career stages 35-39 years and following. For employees in the United States, the earnings elasticity increases in the work-life cycle, but does not significantly differ for female and male employees. In contrast to Germany and the United States, female employees in Great Britain experienced lower wage mobility than male employees. (Fig. 1)

For the German sample the Prais index corroborates the empirical findings of earlier studies that earnings mobility of female employees decreases in the course of the work career [21]. In the United States the index indicates relatively stable earnings mobility patterns of women and men. In Great Britain, earnings mobility of men and women not significantly differs across birth cohorts and career stages. The Bartholomew index weights earnings mobility with the absolute distance of the movements between earnings quintiles shows gender differences of the mobility patterns in the work history. In Germany, older birth cohorts of male employees experience higher earnings mobility than female employees at the beginning of the labor market career. The earnings mobility patterns for employees from younger birth cohorts and corroborates of earlier empirical evidence of a “catching up” of women’s earnings dynamics [10] which may refer to the changing labor market behavior of women, and the effective social policy measures to improve gender equality in the labor market. In the United States earnings mobility of women and men is less expressed than in Germany and Great Britain. In Great Britain, the Bartholomew index indicates gender differences in the mobility patterns.

Female employees aged 40years and more experience significantly lower earnings mobility than men, and younger birth cohorts of male employees experience significantly higher wage mobility than female employees. (Fig. 2)

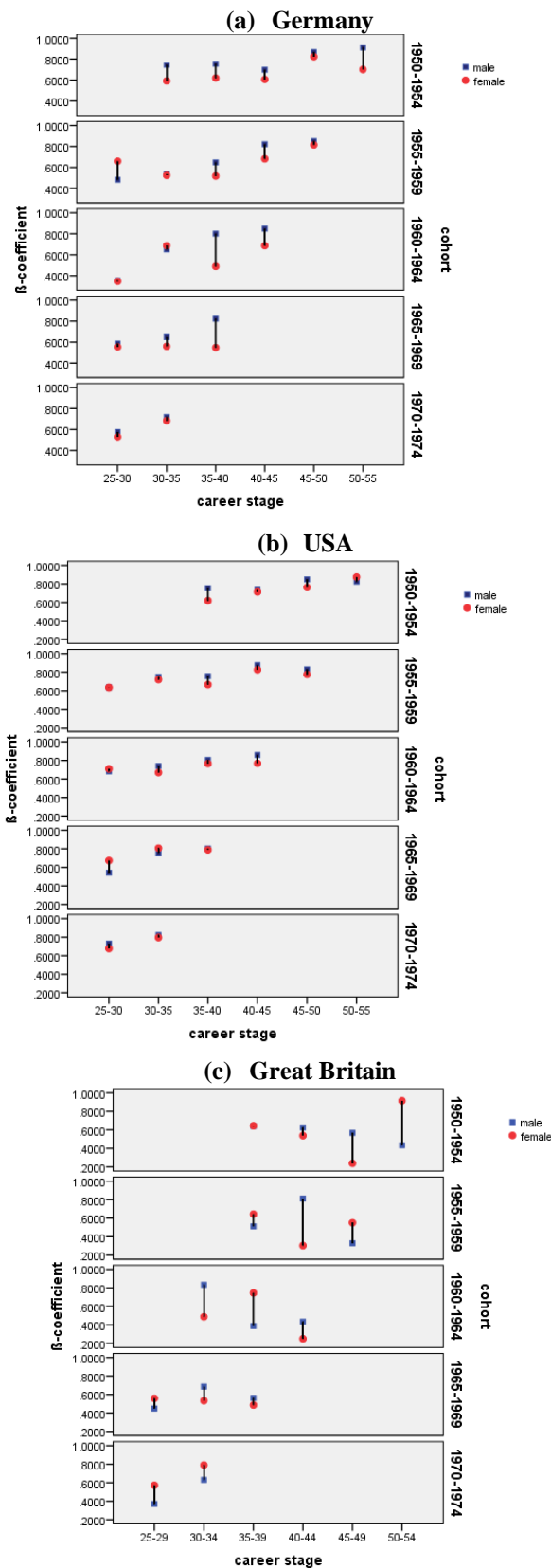
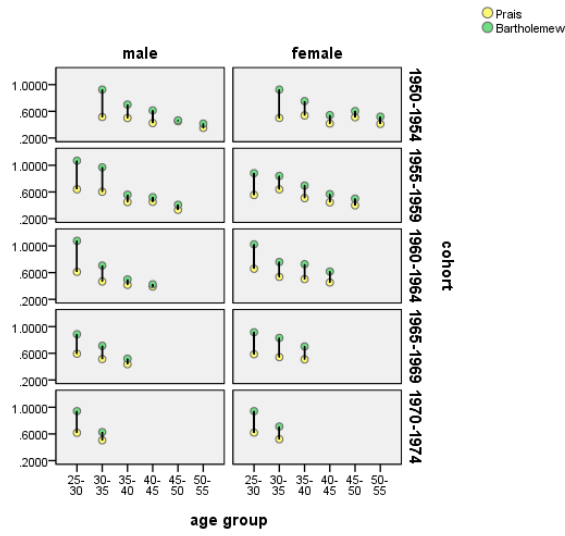
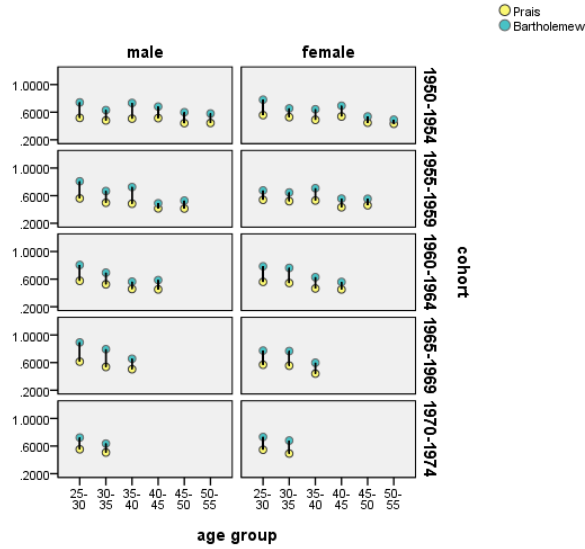


Figure 1: Wage elasticity, β -coefficients. Source: SOEP-PSID-BHPS 1984-2013, own calculations

(a) Germany



(b) United States



(c) Great Britain

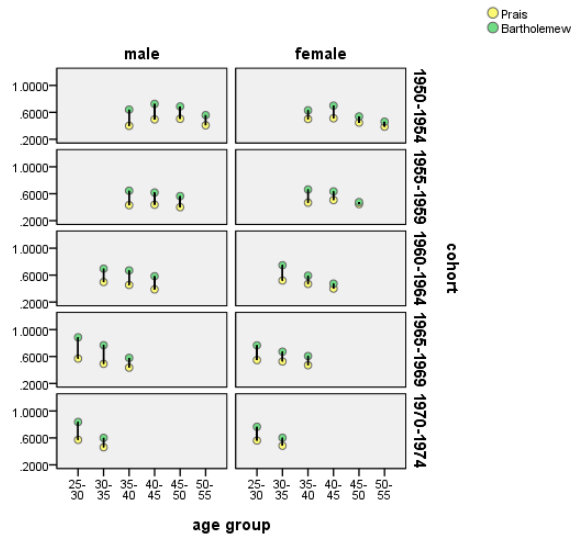


Figure 2: Mobility indices. Source: SOEP-PSID-BHPS 1984-2011, own calculations.

4.2. Determinants of earnings mobility

Table 2 shows the sample size and the descriptive statistics of the dependent and independent variables. Table 3 shows the estimated regression coefficients B_j , the odds ratio ($EXP(B_j)$), as well as the t-ratio (B_j / SE_j). Positive values of (B_j) indicate an increasing relative risk ratio, negative values of (B_j) indicate a decreasing relative risk ratio, and $B_j = 0$ indicates an unchanged relative risk ratio of upward wage mobility.

In all the countries, higher initial wages decrease the probability of upward earnings mobility for male and female employees. In Germany and the United States the effect of education on wage mobility is consistent with the human capital theory: higher education significantly improves the relative risk of upward wage mobility for female and male employees. In Great Britain, an additional child significantly increases the probability of upward wage mobility for female and male employees. In the United States and in Great Britain, male and female employees with part-time jobs experience a significantly lower relative risk of upward wage mobility than employees with full-time jobs. In Germany, this is true only for male employees.

The influence of occupational attainment and the firm's industry on the relative risk of upward earnings mobility is gender specific and differs by country. In all the countries, women with trade and service occupations experience a significantly lower relative risk of upward mobility than women with academic, scientific, or managerial occupations. In the United States, women with professional occupations experience a significant higher relative risk of upward wage mobility compared to employees in academic, scientific, or managerial occupations. In Great Britain, male employees with academic, scientific, or managerial occupations experience a significant higher relative risk of upward wage mobility than male employees in other occupations. In Germany, men employed in the agricultural sector have a significant lower relative risk of upward mobility than employees in the energy/mining, manufacturing/construction, trade/transport, and bank/insurance/service industries. Female employees in energy/mining industries experience a significant higher relative risk of upward wage mobility than women employed in the agricultural sector. In all the countries, climbing up the occupational ladder, as well as the change of employment status significantly increases the relative risk of upward wage mobility for male and female employees.

The empirical results reveal gender differences concerning the relative risk of upward mobility in the work career. In Germany, male and female employees aged 30-34 years respectively 50-54 years, experience a significantly higher relative risk of upward mobility than young employees aged 25-29 years. In the United States, female employees aged 45-49 years, experience a significantly lower relative risk of upward wage mobility than their young colleagues aged 25-29 years. In Great Britain, male employees in the career stages from 35-39 years, and 40-44 years, experience a significantly lower relative risk of upward wage mobility than men at the beginning of the work career (25-29 years). Female employees aged 30-34 years, experience a significantly higher relative risk of upward mobility compared to women at the beginning of the work career (25-29 years).

In Germany, the empirical results corroborate the cohort replacement hypothesis: younger birth-cohorts of female and male employees experience a significantly higher relative risk of upward wage mobility than employees from the birth-cohort [1950-1954]. In the United States, male employees from the birth cohort [1960-1964] experience a lower relative risk of upward mobility compared to employees from the birth cohort [1950-1954]. Employees from the birth cohorts [1965-1969], and [1970-1974] experience a higher relative risk of upward mobility than employees from cohort [1950-1954]. Female employees from the birth cohorts [1955-1959], and [1970-1974] experience a significant lower relative risk of upward wage mobility than female employees from the birth cohort [1950-1954]. In Great Britain, male and female employees from younger birth cohorts experience a not significantly lower relative risk of upward mobility compared with employees from the birth cohort [1950-1954].

In Germany, prospering economic conditions significantly increase the relative risk of upward wage mobility for female and male employees. In the United States and Great Britain, the economic upturn positively affects the relative risk of upward wage mobility of male employees.

The empirical results do not confirm the hypothesis of higher wage mobility in the United States than in Germany. In Germany, the relative risk of upward mobility is significantly higher than in the United States and Great Britain, but gender differences are significantly less expressed in the United States compared to Germany and Great Britain.

Table 2: Descriptive statistics

Variables	Description	Germany				United States				Great Britain			
		male		female		male		female		male		female	
		Mean / %	SE	Mean / %	SE	Mean / %	SE	Mean / %	SE	Mean / %	SE	Mean / %	SE
mob	wage mobility 1 upward mobility, 0 else	4.730		5.199		5.070		5.393		5.571		5.770	
ln(w _i)	natural logarithm of real wage (t) of person i	2.6606	.5224	2.4146	.5498	2.8203	.5507	2.5633	.5663	2.1973	.5245	1.9183	.5435
EDU	education in years (t)	12.127	3.058	12.122	3.0204	12.972	2.208	13.142	2.055				
CHILD	number of children (t)	1.026	1.099	9393	1.004	1.194	1.210	1.319	1.195	1.0758	1.1542	1.0943	1.0775
EMP	employment status (t) 1 full-time, 2 part-time	8735		5177		8137		5531		9125		5398	
OCC	occupation (t): 1 academic/scientific/ managerial	2435		1896		2948		3645		3569		2631	
	2 professional	2086		4720		1325		3733		1897		3923	
	3 trade/personal service	0503		1614		0949		1403		0577		2204	
	4 agricultural, fishery workers	0157		0079		0223		0039		0171		0033	
	5 craftsmen, operators, elementary workers	4819		1690		4555		1180		3787		1209	
IND	industry (t): 1 agriculture	0230		0095		0332		0062		0291		0078	
	2 energy/mining	0265		0068		0356		0073		0278		0070	
	3 manufacturing/construction	4760		2037		3312		1534		3359		1088	
	4 trade/transport	1782		2178		2326		1789		2309		1925	
	5 bank, insurance/services	2963		5622		3473		6533		3762		6840	
DIFF_EMP	change of employment status, 1 ΔEMP ≠ 0, 0 else	3838		4593		4667		5268		4173		4733	
DIFF_OCC	change of occupation ΔOCC < 0	0782		0603		0548		0720		0807		0889	
	ΔOCC = 0	5217		4882		6509		6088		5187		5713	
	ΔOCC > 0	4002		4515		2943		3192		4006		3398	
CAREER	Career stage [age]: 1[25-29]	1673		1478		2790		2652		1336		1287	
	2[30-34]	2383		2121		2547		2440		1981		2034	
	3[35-39]	2526		2566		1606		1617		2341		2345	
	4[40-44]	1715		1865		1298		1421		1998		2042	
	5[45-49]	1104		1295		0738		0804		1208		1264	
	6[50-54]	0598		0675		1021		1068		1137		1028	
COHORT	birth cohort [born in the period]: 1[1950-1954]	2368		2640		3384		3244		2088		2126	
	2[1955-1959]	2462		2376		2964		2948		1958		1885	
	3[1960-1964]	2297		2225		2065		2191		2252		2255	
	4[1965-1969]	1900		1780		0725		0756		2168		2240	
	5[1970-1974]	0974		0978		0862		0861		1534		1494	
GROWTH	GDP growth rate (t) in % [min,max]	[-.7;3.9]		[-.7;3.9]		[-.2;7.3]		[-.2;7.3]		[-1.2;4.3]		[-1.2;4.3]	
N	Number of observations	11,450		9,275		14,784		14,424		6,555		6,427	

Source: SOEP-BHPS-PSID 1980-2013, author's calculations.

Table 3: Relative risk of upward earnings mobility

(a) GERMANY		male			female		
	X _j	B _j	EXP(B _j)	B _j /SE _j	B _j	EXP(B _j)	B _j /SE _j
ln(w _i)	natural logarithm of real wage (t)	-1.3063	.2708***	-20.98	-.8592	.4235***	-13.92
EDU	years of education (t)	.0411	1.0419**	3.86	.0340	1.0319**	2.80
CHILD	children (0-16) in the household (t)	.0362	1.0368	1.45	.0514	1.0528+	1.62
EMP	employment status (t): 1 full-time, 2 part-time	-.7098	.4918***	-8.23	.0117	1.0118	.20
OCC	Occupation (t): 1 academic/scientific/managerial	.0583	1.0560	.71	.0051	1.0051	.06
	2 professional	.1264	1.1348	.96	-.2438	.7836*	-2.22
	3 trade/personal service	.2696	1.3094	.91	-1.016	.3620**	-2.67
	4 fishery/agricultural workers	-.1214	.8857	-1.42	-.0541	.9473	-.46
	5 craftsmen, operators, elementary workers						
IND	industry (t): 1 agriculture	1.1164	3.0539***	3.95	1.1552	3.1746*	2.45
	2 energy/mining	1.0948	2.9887***	4.58	.0706	1.0732	.22
	3 manufacturing/construction	1.1249	3.0799***	4.62	.1807	1.1980	.56
	4 trade/transport	1.4263	4.1634***	5.89	.4667	1.5946	1.45
	5 bank/insurance/services						
DIFF_EMP	change of employment status, 1 ΔEMP ≠ 0, 0 else	1.9569	7.0777***	28.14	.9817	2.6690***	16.67
DIFF_OCC	change of occupation ΔOCC < 0; ΔOCC = 0; ΔOCC > 0	.7044	2.0226***	12.90	.9245	2.5205***	15.61
GROWTH	GDP growth rate (t)	.1497	1.1615*	2.40	.1926	1.2124**	2.67
CAREER STAGE [age]	1[25-29]	.2470	1.2801*	2.57	.2084	1.2317*	1.80
	2[30-34]	-.1180	.8887	-.95	.1468	1.1582	1.01
	3[35-39]	.1043	1.1100	.59	.1805	1.1978	.87
	4[40-44]	.3049	1.3565	.59	.4051	1.4994	1.54
	5[45-49]	.9926	2.6982**	3.36	.9830	2.6725**	2.86
	6[50-54]						
COHORT [born in the period]	1[1950-1954]	.6984	2.0105***	7.02	.5167	1.6765***	4.68
	2[1955-1959]	.6437	1.9036***	5.06	.6976	2.0089***	4.73
	3[1960-1964]	.8192	2.2687***	4.63	.7973	2.2196***	3.80
	4[1965-1969]	.7781	2.1772**	3.40	.7514	2.1200**	2.81
	5[1970-1974]						
	N		10,394			8,240	
	LR chi2 (25)		4716.48			3097.97	
	Prob > chi2		.0000			.0000	
	Pseudo R ²		.3288			.2712	
	LL		-4814.5824			-4161.7568	

Source: SOEP-PSID-BHPS 1980-2013, author's calculations. NOTE: + p<.10, * p<.05; ** p<.01; *** p<.001

Cohort Replacement in Earnings Mobility?– Empirical Evidence from Europe and the United States

(a) USA		male			female		
	X_j	B_j	$EXP(B_j)$	B_j/SE_j	B_j	$EXP(B_j)$	B_j/SE_j
ln(w _i)	natural logarithm of real wage (t)	-1.5105	.2208***	-23.35	-.8272	.4373***	-13.86
EDU	years of education (t)	.0534	1.0548**	3.36	.0651	1.0672***	4.10
CHILD	children (0-16) in the household (t)	-.0372	.9635	-1.559	-.0193	.9809	-.80
EMP	employment status (t): 1 full-time, 2 part-time	-.7807	.4581***	-9.87	-.1609	.8513**	-2.93
OCC	Occupation (t): 1 academic/scientific/managerial						
	2 professional	.0650	1.0671	.69	.1662	1.1808*	2.47
	3 trade/personal service	-.0850	.9187	-.76	-.0363	.9644	-.39
	4 fishery/agricultural workers	-.3751	.6872	-1.28	-.5758	.5622	-.94
	5 craftsmen, operators, elementary workers	-.0752	.9276	-.92	-.0857	.9179	-.73
IND	industry (t): 1 agriculture						
	2 energy/mining	.1393	1.1495	.51	-.2346	.7909	-.43
	3 manufacturing/construction	.1386	1.1487	.58	-.1808	.8163	-.41
	4 trade/transport	.2079	1.2310	.86	-.1108	.8951	-.24
	5 bank/insurance/services	.2635	1.3014	1.09	.1536	1.1666	.34
DIFF_EMP	change of employment status, 1 $\Delta EMP \neq 0$, 0 else	1.9783	7.2304***	31.05	.8084	2.2443***	14.98
DIFF_OCC	change of occupation, 1 $\Delta OCC \neq 0$, 0 else	.4196	1.5213**	7.62	.5165	1.6761***	10.65
GROWTH	GDP growth rate (t)	.0337	1.0343*	2.12	.0113	1.0134	.81
CAREER STAGE [age]	1[25-29]						
	2[30-34]	.0292	1.0296	.38	.0293	1.0298	.39
	3[35-39]	.0402	1.0410	.45	-.0876	.9161	-.98
	4[40-44]	.3734	1.4526**	3.79	.1119	1.1184	1.22
	5[45-49]	.2196	1.2455	1.55	-.2393	.7890-	-1.84
	6[50-54]	-.0036	.9964	-.02	-.3919	.6758*	-2.53
COHORT [born in the period]	1[1950-1954]						
	2[1955-1959]	-.0287	.9717	-.40	-.0509	.9503	-.72
	3[1960-1964]	-.2212	.8015**	-2.75	-.2361	.7897**	-3.12
	4[1965-1969]	.4067	1.5019**	3.04	.0069	1.0070	.05
	5[1970-1974]	.1662	1.1808	1.13	-.2654	.7669*	-1.94
	N		8,024			7,504	
	LR chi2 (25)		2737.50			1729.04	
	Prob > chi2		.0000			.0000	
	Pseudo R ²		.2517			.1674	
	LL		-4069.9494			-4299.1147	

Source: SOEP-PSID-BHPS 1980-2013, author's calculations. NOTE: + p<.10 * p<.05; ** p<.01; *** p<.001

(a) Great Britain		male			female		
	X_j	B_j	$EXP(B_j)$	B_j/SE_j	B_j	$EXP(B_j)$	B_j/SE_j
ln(w _i)	natural logarithm of real wage (t)	-1.5569	.2108***	-18.03	-1.1043	.3314***	-13.97
CHILD	children (0-16) in the household (t)	.0868	1.0907**	2.69	.0977	1.1027**	2.84
EMP	employment status (t): 1 full-time, 2 part-time	-1.1852	.3057***	-7.50	-.1494	.8613*	-2.08
OCC	Occupation (t): 1 academic/scientific/managerial						
	2 professional	-.1886	.8281+	-1.83	-.0209	.9793	-.25
	3 trade/personal service	-.2287	.7956	-1.40	-.5185	.5954***	-4.70
	4 fishery/agricultural workers	-.7488	.4730*	-2.44	-.6281	.5336	-.79
	5 craftsmen, operators, elementary workers	-.2400	.7866*	-2.51	-.3823	.6823**	2.87
IND	industry (t): 1 agriculture						
	2 energy/mining	.3062	1.3582	.94	.0159	1.0161	.03
	3 manufacturing/construction	.5079	1.6619*	1.99	-.1652	.8477	-.40
	4 trade/transport	.4462	1.5624+	1.72	-.2698	.7635	-.65
	5 bank/insurance/services	.5621	1.7544*	2.21	.1686	1.1837	.41
DIFF_EMP	change of employment status, 1 $\Delta EMP \neq 0$, 0 else	2.7292	15.3209***	26.51	.9708	2.6400***	14.49
DIFF_OCC	change of occupation, 1 $\Delta OCC \neq 0$, 0 else	.2838	1.3282***	4.34	.3631	1.4377***	6.31
GROWTH	GDP growth rate (t)	.0852	1.0890*	2.25	.0518	1.0531	1.51
CAREER STAGE [age]	1[25-29]						
	2[30-34]	-.0441	.9568	-.34	.1969	1.2177+	1.63
	3[35-39]	-.2452	.7825	-1.53	-.0358	.9648	-.24
	4[40-44]	-.3834	.6815*	-2.03	.0328	1.0334	-.19
	5[45-49]	-.5836	.5579**	-2.60	.0786	1.0817	.38
	6[50-54]	.3053	1.3570	1.07	.4116	1.5093	1.54
COHORT [born in the period]	1[1950-1954]						
	2[1955-1959]	-.2170	.8049	-1.59	-.1350	.8737	-1.11
	3[1960-1964]	-.1756	.8389	-1.09	-.1194	.8875	-.80
	4[1965-1969]	-.3135	.7309	-1.64	-.1282	.8797	-.73
	5[1970-1974]	-.4406	.6437*	-2.01	-.0138	.9862	-.07
	N		5,359			5,127	
	LR chi2 (25)		2210.81			1145.55	
	Prob > chi2		.0000			.0000	
	Pseudo R ²		.3009			.1616	
	LL		-2568.2992			-2972.3852	

Source: SOEP-PSID-BHPS 1980-2013, author's calculations. NOTE: + p<.10, * p<.05; ** p<.01; *** p<.001

(a) Country Differences		male			female		
	X_j	B_j	$EXP (B_j)$	B_j / SE_j	B_j	$EXP (B_j)$	B_j / SE_j
COUNTRY	1 Germany						
	2 USA	-.5506	.5766***	-24.39	-.7408	.4767***	-31.65
	3 Great Britain	.0541	1.0556*	2.09	-.2357	.7900***	-8.75
	N	23,777			20,871		
	LR chi2 (26)	7796.49			4301.02		
	Prob > chi2	.0000			.0000		
	Pseudo R ²	.2513			.1528		
	LL	-11616.749			-11924.161		

Source: SOEP-PSID-BHPS 1980-2013, author's calculations. NOTE: + p<.10, * p<.05; ** p<.01; *** p<.001

VI. Conclusion

The paper analyzed gender differences of the level of and the determinants influencing wage mobility of employees from different birth cohorts in Germany, Great Britain, and the United States.

- The empirical results do not confirm the hypothesis of higher wage mobility in the United States and in Great Britain compared to Germany. In Germany, the relative risk of upward mobility is significantly higher than in the United States and Great Britain, but gender differences are significantly less expressed in the United States compared to Germany and Great Britain. Male employees in Great Britain experience a significantly higher relative risk of upward mobility compared to German men, whereas the probability of upward wage mobility for female British employees is lower than for German women.
- The contribution of socio-economic variables, family background characteristics, and labor market related attributes to the relative risk of upward mobility is gender specific, and differs by country. In all the countries, an increase of the initial earnings negatively affects upward wage mobility of female and male employees. The effect of educational attainment corroborates the human capital theory, that human capital accumulation induces the probability of upward wage mobility. The influence of occupation and industry on earnings mobility is ambiguous and varies for employees of different birth cohorts and in the course of the employment career. In all the countries, women with trade and service occupations experience a significantly lower relative risk of upward mobility than women with academic, scientific, or managerial occupations. In the United States, women with professional occupations experience a significant higher relative risk of upward wage mobility compared to employees in academic, scientific, or managerial occupations. In Great Britain, male employees with academic, scientific, or managerial occupations experience a significant higher relative risk of upward wage mobility than male employees in other occupations.
- In all the countries, the change of the employment status and climbing up the occupational ladder positively affect upward earnings mobility.
- Prospering economic conditions significantly increase the relative risk of upward wage mobility for female and male employees in Germany. In the United States and Great Britain, the economic upturn increases the relative risk of upward wage mobility for male employees.
- The results corroborate the cohort replacement hypothesis for Germany. Young men's earnings at the bottom of the earnings distribution grow faster than women's which may perpetuate gender differences in earnings.

The changing labor market behavior of women contributes to a reduction of gender differences in wage mobility patterns, especially for younger cohorts of employees. However, gender differences of earnings mobility across the work career still continue to contribute to persistent economic and social stratification. The economic and social policies are forced to continue the efforts to promote equal opportunity strategies in the labor markets.

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