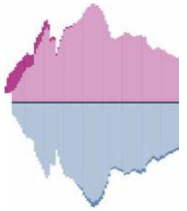

Professur für Bevölkerungswissenschaft
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Discussion Papers

No. 4/2011

10

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Late Careers and Socio-Economic Structures in Europe

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(Henriette Engelhardt and Christopher Schmidt)

Abstract: In this paper we investigate the effects of demographic, economic and labour-market structures on labour-force participation and transition to retirement for older males in eleven European countries. Theoretically, our analysis is guided by considerations of intragenerational competition and intergenerational substitution. Following Easterlin's hypothesis that intragenerational competition rises with cohort size, we assume a negative effect of cohort size on labour-force participation and a positive effect on early retirement. Taking into account that different cohorts are substitutes at least to a certain extent, we assume that the probability for early retirement will be reduced by a high intergenerational exchange ratio in favour of older workers. Thus, labour-force participation is both influenced by the populations' age structure when entering the labour-force and during the career. Moreover, low shares of graduates in older cohorts are expected to reduce older workers' chances of being employed. Next to demographic structures, general economic conditions like GDP per capita and its development during working life force or hamper employment of older workers. Additionally, labour-market structures like unemployment rates, the extent of part-time work or the amount of service jobs influence individual labour-force participation and transition to retirement. To test these hypotheses, we use merged data from the first two waves of SHARE and macro-level indicators. We estimate a two-level random-incept logit-model which allows to determine the share of variance in international late careers that can be attributed to country-specific factors and to quantify the relative impact of specific socio-demographic and socio-economic backgrounds.Our results imply that cross-national variation in labour-force participation is mainly driven by the instance of long-term unemployment and the share of highly educated older men. While our analyses confirm the hypothesis on intragenerational competition, we do not find evidence for intergenerational competition forcing early retirement.

Keywords: older workers, labour-force participation, early retirement, relative cohort size, multi-level modelling

1 Introduction

Labour markets in Europe are characterised by low employment and labour-force participation rates of older workers due to early withdrawal from work. Sustainable demographic change in Europe is calling for “unused capacity” for active work, though (Börsch-Supan et al. 2009). Therefore, many countries have introduced institutional reforms like increasing mandatory retirement age in order to increase labour supply of the aged (Eichhorst 2011). Although labour-force participation of older workers has increased in most European countries over the last years, the shares of older men being employed or at least not having retired differ markedly across Europe (Figure 1). Participation rates vary from 85% in Switzerland and 82% in Sweden, to 60% in Belgium and France in 2009. Employment rates vary to a somewhat greater extent between countries and over time, but reveal mainly similar patterns.

Figure 1: Labour-force participation and employment rates of males aged 50 to 64, 1983-2009

Data: Online Database Eurostat (2010), selected countries.

From a theoretical point of view, variations in labour-force participation have their origin in a number of different determinants. On the one hand, differences in labour-force participation rates are seen as a demand deficiency of firms driven by economic constraints in times of economic downturns (Auer and Fortuny 2000; Dorn and Souza-Posa 2010). On the other hand, low participation rates are regarded as being determined by personal choices motivated by individual and institutional factors

(Buchholz et al. 2006; Hofäcker 2010; Engelhardt 2011). By focussing on institutional settings and statutory provisions, structural effects are mostly disregarded in explaining internationally varying labour-force participation. Differing age structures and cohorts' educational attainment influence labour participation in addition to structures of the labour-market and economic conditions (Bloom et al. 1987; Garloff et al. 2010; Stenberg, Wikström 2004; Zimmermann 1991).

Ideas on possible effects of the population's age structure on individual careers go back to Easterlin's hypothesis, which suggests that the relative size of a cohort is positively associated with the level of intragenerational competition (Easterlin 1980). Rising competition operates as a relative disadvantage for members of large birth cohorts when they enter the labour market and finally results in lower participation rates. This relationship should additionally be shaped by cohort succession: The size of younger cohorts should be negatively related to labour-force participation of older workers as they might be substituted (Macunovich 2009). Drawing on these ideas, we assume that demographic and socio-economic structures influence current labour-force participation and transition to retirement through socio-demographic and socio-economic conditions when entering the labour market as well as to the present day. In particular, we analyse the effects of age distributions, educational compositions as well as labour-market and economic conditions on late careers in Europe using data from the first two waves of the Survey of Health, Ageing and Retirement in Europa (SHARE), complemented by aggregate data from Eurostat.

The following section discusses theoretical effects of demographic, economic, and labour-market structures and their micro-level consequences; in addition, it surveys related work in the literature. The third section provides a detailed presentation of the data, variables, and method of analysis. Section four presents and comments on the results of the empirical analysis. The paper concludes with a summary and an outlook on further research from which the research community may benefit.

2 Theoretical framework

Effects of demographic, economic and labour-market structures on late careers

It is well established that labour-force participation and transition to retirement vary with country-specific characteristics, in particular with countries' economic and institutional features like business cycles (e.g. Bils 1985, Bosworth, Burtless 2010; Bover et al. 2002; Darby et al. 2001; Dereveux 2000; Elsby et al. 2010), pension

systems and welfare arrangements (Debrand and Sirven 2009, Börsch-Supan et al. 2009; Engelhardt 2011), employment relation systems, education systems and employment-sustaining active labour-market policies (Eichhorst 2006; Buchholz et al. 2006; Hofäcker 2010; Engelhardt 2011; Engelhardt, Roppelt 2011). Less attention has been paid to the international variation of late careers by demographic, labour-market and long-run economic structures.

As Easterlin (1980: 29ff) pointed out, relative cohort size (the ratio of young to old) affects individual chances throughout the whole lifecycle. Belonging to a comparatively large birth cohort negatively influences one's chance of successfully entering the labour market as well as the chance to stay in. Easterlin argues that rising relative cohort size leads to higher competition within a cohort. Consequently, members of large cohorts share a higher risk of unemployment when they enter labour market (Bloom et al. 1987). This effect is also called 'cohort crowding' and mainly refers to consequences for educational attainment, unemployment and wages at the beginning of the working life (e.g. Bound, Turner 2007; Keister, Deeb-Sossa 2001; Korenman, Neumark 2000; Welch 1979). In line with Easterlin, we assume that this effect of intragenerational competition lasts over the whole career. Thus, relative cohort size when entering the labour market has a negative impact on labour-force participation rates in older ages. Therefore, cross-national variation in labour-force participation and retirement should be explained – at least to some extent – by different relative cohort sizes.

Moreover, there is empirical evidence that the older generation is crowded out by the younger generation: Performing time-series analysis with cointegration techniques on age-specific unemployment rates from 1967 to 1988, Zimmermann (1991) finds for West Germany a positive impact of relative cohort size (number of 15 to 34 year olds divided by the number of 35 to 54 year olds) and relative cohort age (mean age of young cohort divided by the mean age of old cohort) on unemployment of the older generation both in the short- and in the long-run. Analysing cross-state differences in the United States from 1978 to 1996, Shimer (2001) uncovers a negative effect of the youth share of the working age population (number of 16 to 24 year olds divided by the number of 16 to 64 year olds) on age-specific unemployment and a positive effect on age-specific participation and employment rates. Shimer's theoretical argument for this quite surprising effect on unemployment recurs to young workers creating fluid labour markets due to increased mobility and thereby stimulating vacancy

creation. This argument is not sufficient, though, for explaining cross-national differences in labour-force participation and retirement. We assume that countries with a high prevalence on on-the-job training and less institutionalised careers produce higher rates of turnover of workers. Following Shimer, in local labour markets with an above-average percentage of young employees more jobs should be offered easing labour-force participation and labour maintenance of the aged. On national level though, we suppose intergenerational competition to be the driving force. If large cohorts enter the labour market, competition between cohorts increases and labour-force participation of the elderly should be shrinking, whereas exit rates should be rising.

The correlation between relative cohort size of the young and labour-force participation of the aged only holds true under the assumption that younger and older workers are substitutes at least to some extent. For so called “bridge jobs” (Ruhm 1990) which are predominantly widespread in the US, this assumption is well established (e.g., Macunovic 2009). However, there is no or just little evidence that younger and older workers are substitutes in other jobs (Card, Lemieux 2001; Hamermesh 1993; Kalwij et al. 2009). They differ concerning their skill-levels as job requirements and occupational structure altered from cohort to cohort in line with technological change (Acemoglu 2002; Blossfeld 1987, 1989; DiPrete et al. 1997). Therefore, different education and training of young and old workers inhibits them from being exchangeable. Hence, they might be substitutes only for unskilled jobs. An increasing share of highly qualified among the aged (i.e., with tertiary education) should thus result in an enhanced probability of labour-force participation for workers of all educational levels in the older age group.

This macro-micro relation differs from individual-level effect of education, which states that high education is in line with lower risk of unemployment and higher chances of (re)employment (Buchholz et al. 2006; Chan, Stevens 2001; Hairault et al. 2010). If older workers only compete with the younger for unskilled jobs, tertiary educated older workers are out of contest. Assuming a constant supply of low-skilled jobs, a large share of older workers with high levels of education will then reduce competition. A limited number of competitors increases the individual probability to get hired for less skilled older workers.

Current labour-market conditions influence participation and exit rates next to age structure and cohorts’ educational attainment. Especially reduced working hours at

higher ages are considered as an instrument to postpone the age of retirement and therefore enhance labour-force participation among the elderly (Bosch, Schief 2007; Delsen 1996). The availability of part-time jobs for older workers should affect individual labour-force participation positively and accordingly also transition to retirement negatively. Additionally, employment in the service sector is also regarded as a factor which enhances chances of late employment because of less economic restructuring due to globalisation in this sector (Blossfeld et al. 2006). Hence, we assume that the share of older employees working in service jobs is positively correlated with the probability of labour-force participation and negatively with labour-market exits.

Another aspect of the current labour-market situation is unemployment. In some countries, e.g. Germany, long-term unemployment is widespread among the aged (OECD 2005) and unemployment is often used as a pathway into retirement (Brussig, Wübbecke 2009). Thus, higher levels of long-term unemployment of older people indicate poor employment opportunities as well as a prevalent bridge strategy, leading to different effects on individual labour-force participation. On the one hand, we expect a negative effect of long-term unemployment as unemployment is completely involuntary and exits into retirement are realised as soon as possible. On the other hand, we assume a non-negative effect on individual labour-force participation as long-term unemployment is, at least to some extent, voluntary and provides a commonly used pathway into retirement. Therefore, long-term unemployment should not be correlated with an increased risk of retirement or the chance of labour-force participation.

All socio-demographic and labour-market related factors discussed so far result in an oversupply of labour. Mainly economic research shows that business cycles influence job opportunities by shaping the demand of labour. According to Okun's law there is a negative relation between unemployment and economic strength (Lee 2000; Okun 1962). Economic expansion affects the timing of retirement through two channels, a stronger job market and gains in individual wealth. The two phenomena have opposite effects. A stronger economy causes employees to increase new hires and to reduce firing respectively to delay retirements that would otherwise have occurred earlier. Prosperity increases the individual resources for realizing a preference for leisure and leaving the workforce. Economic recession affects the timing of retirement in each channel in the opposite direction (Bosworth, Burtless 2010).

Albeit most research deals with short-run consequences of economic development (e.g. Bils 1985; Bosworth, Burtless 2010; Bover et al. 2002; Darby et al. 2001; Dereveux 2000; Elsby et al. 2010), recent empirical studies reveal evidence that economic conditions in times of entering the labour market influence not only initial job opportunities and wages but also later careers (Brunner, Kuhn 2010; Kahn 2010; Kwon et al. 2010; Oreopoulos et al. 2008). In accordance with Easterlin's hypothesis on relative cohort size, economic conditions at labour-market entry are assumed to shape future opportunities. As episodes of booms or busts force employers to offer or to discard specific jobs, careers of young workers might be tracked through a demand surplus respectively deficit (Brunner, Kuhn 2010). Therefore, GDP per capita at labour-market entry should explain country-specific variation and it should be negatively related to labour-market exits.

Effects of the work context and individual characteristics on late careers

The variation in late careers due to demographic, economic and labour-market differences seen between countries is mirrored by variation across industries and individuals. The work context and individual characteristics in particular, are important determinants of labour-force participation of older workers.

Far-reaching changes in the labour market due to globalisation and the 'crisis of mass production' (Castells 2000) encourage firms to react by readjusting staff. Especially classical industries like manufacturing are hit by a need for restructuring as they shrink all over Europe. Older employees in such sectors should therefore show a higher probability of entering early retirement than employees in growing economic sectors, such as the service sector (Buchholz et al. 2006). Besides the sector, firm size affects the probability of retirement positively. Larger firms have to adjust their organisational structures, entailing a need for both staff reduction and relocation of work to outside supplier networks (Hofäcker 2010). Both downsizing and outsourcing concern older employees as they often receive higher wages (Hutchens 1986; Lazear 1979) and their re-training is less profitable (Prskawetz, Lindh 2006). Additionally, larger firms are better suited to offer early retirement incentives. Occupational pension schemes and severance payments add up to 'offers that one does not refuse' (Bellmann, Janik 2007). Thus, employees in large firms should have an increased probability of early retirement (Buchholz et al. 2006).

While industries or specific types of work are declining, individual occupation and qualification is of particular importance for late careers. High qualification protects people from several labour-market risks (Blossfeld et al. 2006). A low level of education should generally lower labour-force participation and increase the risk of early retirement.

In addition to these 'push factors' (Schils 2008) out of employment, labour-force status itself is crucial. As Blöndal and Scarpetta (1998) show, the self-employed have a very low likelihood of leaving the labour market early. Self-employment implies individual pension plans and high commitment to work. Early retirement is often impossible or at least not wanted for these reasons. Moreover, empirical work demonstrates that health status, and particularly the notion of disability, is an important variable in workforce participation (Currie, Madrian 1999; Börsch-Supan et al. 2009).

Finally, effects of household composition and characteristics of the partner should be an important factor in labour-force participation and labour-market exit. Research on 'coupled retirement' has shown that many couples 'coordinate' their retirement transition. Thus, the influence of coupled retirement has to be considered explicitly (Blöndal, Scarpetta 1998; Drobnič 2002).

3 Data and Methods

Individual data

In order to study late careers, we use the first two waves (2004/05 and 2006/07) of the Survey of Health, Ageing, and Retirement in Europe (SHARE) which collects individual data on employment, health, and various socio-economic variables for persons aged 50+ across 14 European countries (Börsch-Supan, Jürges 2005).[1] The data of 11 countries that participated in both waves permit the identification of labour-force participation in 2004, transitions from work to retirement between 2004 and 2006, and the individual and contextual factors motivating these work-to-retirement transitions. In order to cover a broad age range at which late-career transitions can take place, we consider individuals aged 50 to 64 at the time of the first wave for

[1] This paper uses data from SHARE release 2.3.0, as of November 13th 2009. SHARE data collection in 2004-2007 was primarily funded by the European Commission through its 5th and 6th framework programmes (project numbers QLK6-CT-2001-00360; RII-CT-2006-062193; CIT5-CT-2005-028857). Additional funding by the US National Institute on Aging (grant numbers U01 AG09740-13S2; P01 AG005842; P01 AG08291; P30 AG12815; Y1-AG-4553-01; OGHA 04-064; R21 AG025169) as well as by various national sources is gratefully acknowledged (see http://www.share-project.org for a full list of funding institutions).

analyses of labour-force participation as well as an age range from 50 to 61 years at the first wave for retirement analyses. For Austria and Italy, for example, it is known that the process of labour-force withdrawal occasionally starts at this early age.

As the 11 countries show very different labour-force participation rates for women of these ages, we restrict our sample to an analysis of male late-career patterns. An analysis of women would, on the one hand, create sample-size problems particularly in conservative and in Southern European countries, where few older women work. On the other hand, these women would constitute a very selective group which would limit the degree to which the results can be generalised to future generations. This age window and target group restricts the sample to 4,557 observations for the labour-participation analyses and to 2,739 observations for the analyses of transition to inactivity. The number of cases is further reduced, slightly, due to missing observations on relevant covariates.

In the following, we look at labour-force participation and transitions into inactivity which are any transitions from a self-reported activity status within the labour force (employed, self-employed or unemployed) to inactivity (retired, permanently sick, disabled or homemaker) between the first and second wave. Unlike looking at transitions from employment to non-employment, this type of analysis allows to investigate when individuals withdraw effectively from the labour force instead of looking at potentially temporary job losses.

As explanatory variables for the transition into inactivity, we use a number of indicators representing the key factors at the micro-level. The means of these variables both in the labour-force participation and the labour-market exit model are displayed in Table 1. As control variables we include dummy variables for both age and subjective health. Age is grouped into three-year intervals and subjective perception of respondents' health is differentiated by 'good or better' (0) and 'less than good' (1). Both variables can be considered to represent key factors that generally influence the likelihood of remaining employed or exiting the labour-force beyond the hypothesised influence of human capital, workplace, and financial factors, and should therefore be included in the model. The highest level of general or higher education completed is used as a proxy variable for human capital characteristics, which allows the distinction between third-level education (ISCED codes 5 to 7), secondary-level education (ISCED 3 and 4) and less than secondary-level education (ISCED codes 0 to 2).

Information on the size of the firm is classified in large (more than 200 employees), medium-sized (25–199 employees) and small firms (fewer than 25 employees). However, information on firm size has been collected only for private sector employees. To account for this, we additionally introduce a dummy variable differentiating between public and private sector as well as self-employment. Moreover, tertiary and non-tertiary sector is explicitly controlled for. Finally, we use a dummy variable indicating whether the respondent is satisfied with the job.

Table 1: Means of variables used in the analysis of labour-force participation and labour-market exit

	Labour-force participation			Labour-market exit		
	Participants	Non participants	Total	In the labour market	Out of the labour market	Total
Individual characteristics						
Age 50-52	0.268	0.048 ***	0.193	0.333	0.084 ***	0.293
Age 53-55	0.267	0.082 ***	0.204	0.309	0.209 ***	0.292
Age 56-58	0.235	0.183 ***	0.217	0.240	0.339 ***	0.256
Age 59-61	0.147	0.302 ***	0.199	0.119	0.367 ***	0.159
Age-62-64	0.084	0.386 ***	0.187			
Primary education	0.332	0.460 ***	0.375	0.316	0.369 *	0.325
Secondary education	0.375	0.336 **	0.361	0.383	0.372	0.381
Third-level education	0.293	0.205 ***	0.263	0.301	0.259	0.294
Less than good health	0.126	0.297 ***	0.184	0.114	0.202 ***	0.128
Household characteristics						
Log (HH gross income)	10.578	10.259 ***	10.469	10.608	10.424 ***	10.578
Log (household size)	0.877	0.770 ***	0.841	0.906	0.830 ***	0.894
Partner employed	0.473	0.066 ***	0.334	0.499	0.404 ***	0.484
No partner	0.144	0.149	0.146	0.148	0.110 *	0.142
Characteristics of (last) job						
Self-employed	0.223	0.117 ***	0.206			
Unemployed	0.071	0.170 ***	0.087			
Tertiary sector	0.549	0.523 *	0.545			
Public sector	0.279	0.310	0.284			
1-24 employees	0.560	0.555	0.559			
25-199 employees	0.272	0.250	0.268			
200 employees	0.168	0.195	0.173			
Satisfied with job	0.863	0.739 ***	0.843			
Observations	2962	1532	4494	2265	436	2701

Notes: Means and observations refer to the full model where all observations with missing values are dropped; difference between the two groups significant at + p<0.10, * p<0.05, ** p<0.01, *** p<0.001
Source: SHARE, Version 2.3.0; own calculations

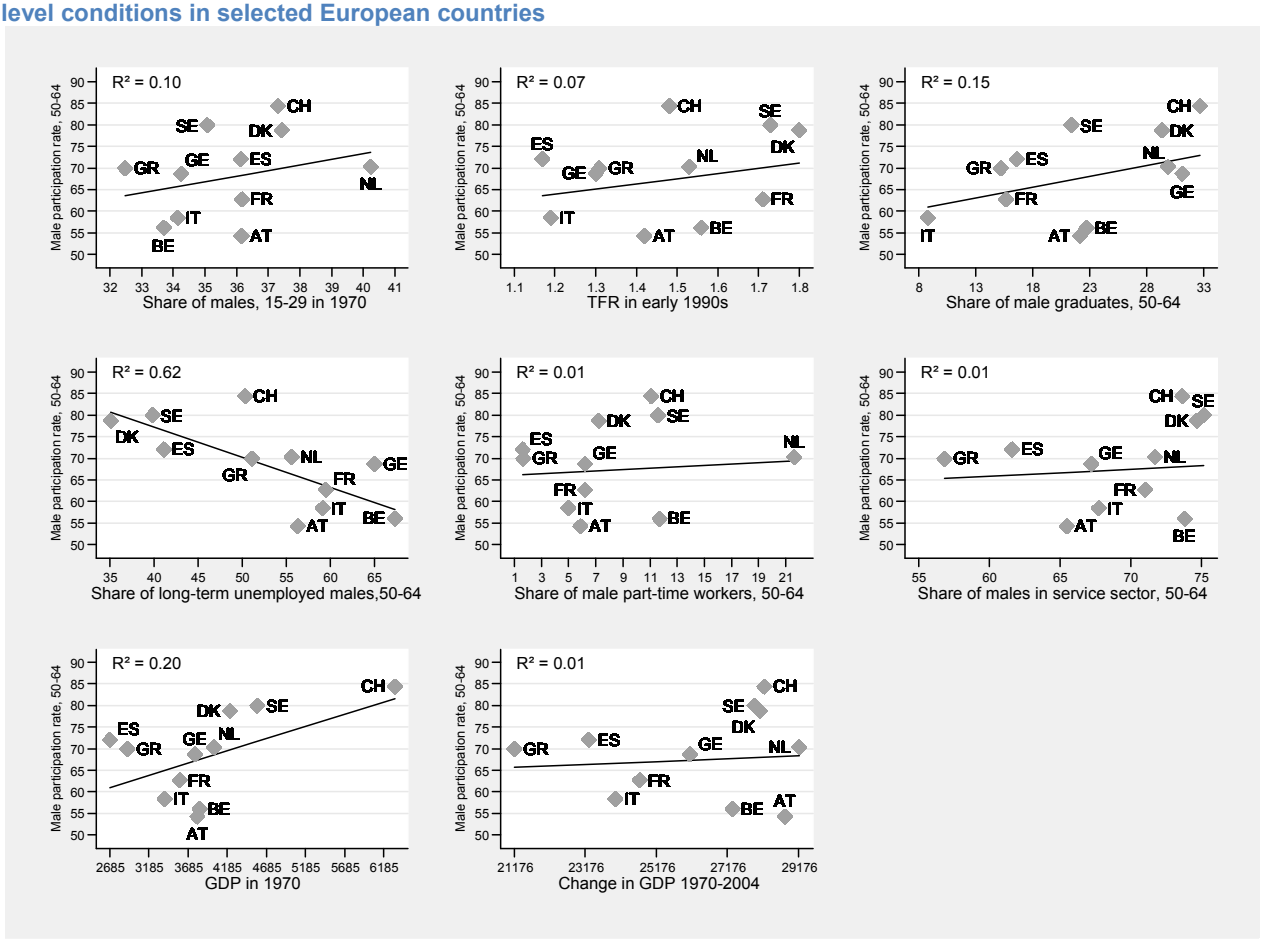
On the household level, imputed total gross household income divided by the purchasing power parity (ppp) is used (i.e. the nominal gross income) in logarithms, which is especially appropriate for comparisons of countries with different levels of income. To avoid assumptions about an equivalence scale, household size is additionally considered in logarithms. Moreover, the presence of a partner in the household and the employment activity of the partner are captured with two dummy variables.

Aggregate data

Macro-level data on demographic structures as well as the economic and labour-market structures are taken from Eurostat and refer to the time of the first wave of SHARE if not stated otherwise. Figure 2 provides an overview on the relation

between the socio-economic variables and labour-force participation rate of men aged 50 to 64 for our SHARE countries in 2004.

Figure 2: Participation rates of men aged 50-64 in 2004 and selected indicators of socio-economic macro-level conditions in selected European countries



Source: SHARE, Version 2.3.0 and Eurostat; own calculations.

The indicator for testing Easterlin's hypothesis on the relative cohort size is the share of men aged 15 to 29 years within the total male workforce in 1970. Figure 2 shows (first graph, top left) a slight correlation between the share of young men in 1970 and the labour-force participation of men aged 50 to 64 in 2004. Contrary to Easterlin's hypothesis, we find a positive relation on the aggregated level. Comparatively large entry cohorts in the 1970s participate exceedingly compared to the average. There is no evidence for intragenerational competition from a country-level perspective.

For testing the hypothesis on intergenerational competition between young and old workers, we were not able to refer to relative cohort size of young and old in 2004: Measuring both relative cohort sizes would cause endogeneity. Following Macunovich (2009), the size of the younger cohort is instrumented by the mean lagged total fertility rate in the first half of the 1990s. If fertility was high in these times, there are potentially more young competitors in 2004. Empirically, there is a slightly positive relation between fertility and male labour-force participation (cf.

Figure 2). Therefore, we cannot support the competition hypothesis on intergenerational competition for our SHARE countries.

Educational attainment is measured by the share of older men who completed tertiary education. Figure 2 shows the positive relation we assumed in section 2.

Concerning unemployment, we tested the percentage of men being long-term unemployed among the aged. In line with our hypothesis, high shares of long-term unemployed correlate – at least on the macro-level – with low participation rates. However, the portion of older men working part-time and the share of 50- to 64-year-old men working in service jobs are not related to labour-force participation on the macro-level.

In order to quantify economic concomitants we use GDP per capita (adjusted for purchasing power parity) in US-Dollars in 1970 and its change compared to 2004. GDP in 1970 shows the assumed positive relation with labour-force participation. Economic growth measured as the difference in GDP between 1970 and 2004 is not related to labour-force participation, though.

Method

In order to estimate the effects of the determinants of labour-force participation and transition to inactivity, we have to account for the hierarchical structure of the data: Subjects nested within the same country are expected to be more similar than subjects from different countries with regard to labour-force participation owing to shared environments. The observations may therefore not be assumed to be independent as required for simple regression or analysis of variance. Ignoring the multilevel structure of the data can result in biases in parameter as well as biases in their standard errors (Guo, Zhao 2000; Rabe-Hesketh, Skrondal 2005). One way of correcting for the clustering of observations is to use a robust variance estimator for clustered data. However, the interdependence between members of the same country can be modelled directly by introducing random effects for countries into the regression model. In this framework of multilevel modelling, the probability of labour-force participation and of transition to inactivity p_{ij} may be written as:

$$log\left[\frac{p_{ij}}{1-p_{ij}}\right] = \beta_0 + \beta_1 x_{1,ij} + \ldots + \beta_k x_{k,ij} + u_j + v_{ij}.$$

The indices $i$and j denote subjects and countries, respectively, and k the number of observed individual or institutional explanatory variablesx_{ij}. The random part consists

of u_j, the country-specific error term, and v_{ij}, the error term specific to the individual. The random country effect may be interpreted as the effect of any country-specific predictors that have not been controlled for (or have not even been measured). These predictors may include shared environmental factors, including social contexts and norms. Similarly, the residual term for subjects within countries may be interpreted as the effect of characteristics specific to the individual, plus measurement errors. Both error terms are assumed to be independently distributed also with regard to the covariates, with zero means and constant variances denoted σ_v^2 (within-country-variance) and σ_u^2 (between-country-variance). Adding the explanatory variables, measured both at the country and the individual level, will reduce the variance of the error terms, and therefore inform us about the importance of the country-level variables in explaining the variation in the outcome variable. The residual intra-class correlation ρ provides an alternative in assessing the importance of country level variables is through

$$\rho = \frac{\sigma_u^2}{(\sigma_u^2 + \sigma_v^2)},$$

where $\sigma_v^2 = \frac{\pi^2}{3}$ in case of the logit-model (cf. Snijders, Bosker 1999: 213ff). The residual intra-class correlation (ICC) represents the ratio of random effect variance u to the total variance, and thus can be interpreted as the proportion of observed variation in the dependent variable that is accounted for by the country level. Its value decreases as the part of variance explained by the individual component is large. The percentage of variance attributable to individual-level characteristics is easily calculated by 1 –ρ.

When interpreting the significance levels of the estimated coefficients and variance parameter, one has to be cautious. Power of statistical tests (which is equal to 1 minus the type-two error probability) generally depends on sample size. In multilevel models, there is a sample size for each level. For testing the effect of a level-one variable, the level-one sample size is of main importance; for testing the effect of a level-two variable it is the level-two sample size. As there are only eleven observations at the national level, the power of the statistical test that a level-two coefficient is zero is rather limited (Snijders 2005).

4 Results

Starting point of the multilevel analysis is an 'empty model' without any covariates. This model serves as a benchmark to test the explanatory power of the covariates when added to the analysis. Progressively, we include individual and structural variables to assess how they affect the variation in labour-force participation. In order to compare the strength of the effect of covariates measured with different metrics, we present standardised coefficients. For each of the specifications, we report the estimated variances of the country-specific error term and the ICC coefficient. The estimated variances give us an idea to what extent country differences are explained by macro variables. Naturally, a sizeable reduction in the variance means that the macro variable is important in explaining country differences. In addition, the ICC coefficient gives us an idea of how the variance for the country-level error term compares with the individual-level variance. In general, adding the macro variables that explain country differences, the ICC coefficient goes down.

Labour-force participation

Model 0 in Table 2 shows the results from the multilevel logistic regression analysis of men's labour-force participation. The intra-class correlation ρ measures the share of variation in the dependent variable attributable to unobserved country-level characteristics. In the empty model without covariates, the ICC amounts 0.07. Thus, about 7% of the variance in the propensity of labour-force participation in Europe can be attributed to unobserved country-specific factors. The estimated residual between country variance is about 0.25, but goes up to 0.29 once we include the individual level variables. The ICC follows accordingly, increasing to 0.08. This can be understood from the fact that the individual level variables do not vary considerably at the country level. Thus, the individual level variables do not explain the differences in labour-force participation in Europe. However, as we add certain country level variables, we see a reduction in the ICC.

Concerning the covariates at the individual level, the estimated standardised coefficients show the expected effects and remain rather similar for the different model specifications, also in cases where the country-level variables are added. As predicted, the likelihood of being part of the active labour force decreases significantly with age, increases with higher education and is reduced in case of less than good health (model 1). Moreover, the probability of labour-force participation is

increased for high income households and in larger households. With an employed partner, labour-force participation is significantly increased and also when no partner is present.

Table 2: Individual and socio-economic determinants of labour-force participation of males aged 50-64 in wave 1

	M0	M1	M2	M3	M4	M5	M6
Age 53-55		-0.263+	-0.263+	-0.261+	-0.262+	-0.262+	-0.262+
		(1.82)	(1.82)	(1.81)	(1.82)	(1.82)	(1.82)
Age 56-58		-1.114***	-1.114***	-1.110***	-1.113***	-1.112***	-1.108***
		(8.21)	(8.20)	(8.18)	(8.20)	(8.20)	(8.16)
Age 59-61		-1.907***	-1.907***	-1.904***	-1.906***	-1.905***	-1.908***
		(14.40)	(14.39)	(14.37)	(14.39)	(14.38)	(14.40)
Age 62-64		-2.545***	-2.545***	-2.542***	-2.543***	-2.543***	-2.544***
		(18.77)	(18.76)	(18.74)	(18.76)	(18.75)	(18.75)
Secondary education		0.244*	0.244*	0.229*	0.250*	0.238*	0.229*
		(2.35)	(2.35)	(2.20)	(2.41)	(2.29)	(2.20)
Third-level education		0.369***	0.369***	0.357***	0.373***	0.367***	0.357***
		(3.45)	(3.45)	(3.33)	(3.50)	(3.43)	(3.33)
Less than good health		-0.920***	-0.920***	-0.923***	-0.917***	-0.917***	-0.919***
		(10.79)	(10.80)	(10.83)	(10.76)	(10.77)	(10.76)
Log (HH gross income)		0.235*	0.235*	0.228*	0.234*	0.230*	0.233*
		(2.53)	(2.52)	(2.45)	(2.51)	(2.47)	(2.50)
Log (HH size)		0.312*	0.312*	0.330*	0.314*	0.325*	0.327*
		(2.42)	(2.42)	(2.55)	(2.43)	(2.51)	(2.52)
Partner employed		2.277***	2.278***	2.277***	2.274***	2.275***	2.276***
		(18.79)	(18.79)	(18.79)	(18.78)	(18.78)	(18.77)
No partner		0.604***	0.605***	0.612***	0.602***	0.609***	0.607***
		(5.19)	(5.19)	(5.25)	(5.17)	(5.23)	(5.21)
Share of males, 15-29 in 1970			0.168				-0.668*
			(0.42)				(2.40)
TFR in early 1990s			-0.067				-0.562*
			(0.18)				(2.01)
Share of male graduates, 50-64				0.543+			0.696**
				(1.80)			(2.84)
Share of long-term unemployed males, 50-64					-0.707*		-1.001***
					(2.34)		(4.45)
Share of male part-time workers, 50-64					0.266		0.375
					(0.65)		(1.18)
Share of males in service sector, 50-64					-0.142		0.046
					(0.35)		(0.12)
GDP in 1970						0.373	0.118
						(1.40)	(0.48)
Between-country-variance	0.247**	0.294**	0.289**	0.223**	0.186***	0.249**	0.052***
	(3.08)	(2.64)	(2.68)	(3.19)	(3.46)	(2.99)	(4.91)
Intra-class correlation (ICC)	0.070	0.082	0.081	0.064	0.054	0.070	0.015
Explained country variance			0.015	0.242	0.366	0.153	0.824
BIC		3843.8	3860.4	3849.3	3864.5	3850.3	3886.5
Observations	5682.8	4494	4494	4494	4494	4494	4494

Notes: Standardised beta coefficients; Absolute t statistics in parentheses; + p<0.10, * p<0.05, ** p<0.01, *** p<0.001
Source: SHARE, Version 2.3.0; own calculations

On the national level, the two indicators considering the age structure are introduced in the model (model 2). The effects however, are not significantly different from zero. In contrast, the effect of educational attainment indicates that employment increases significantly with the share of male graduates in the population (model 3). Moreover, labour-force participation decreases significantly with an increasing share of older males being long-term unemployed, whereas the share of male part-time workers aged 50 and older and the share of males employed in the service sector have no

effect significantly different from zero (model 4). The same holds true for the economic situation when entering the labour market (model 5). The change in GDP from 1970 to 2004 is not included in the model as it does not add any explanatory power.

Under control of indicators from the age structure, the estimated variance of the country-specific error term amounts 0.289 which is significantly different from zero and slightly smaller than in the model with individual characteristics (model 1). Using the country variances of both models, we can compute the explained context-level variance according to the 'proportional reduction of error' logic by dividing the difference of the country level variances between model 1 and the conditional model by the variance of model 2 (0.294 – 0.289/0.294=0.015). Only about 1.5% of the regional variance is explained by the indicators of the age structure. This result is of course plausible given that we did not find a coefficient of the indicators significantly different from zero. Regarding the educational structure, the amount of variance explained is 24.2%. Concerning the labour-market structure, explained variance increases to 36.6% and contributes thus most to the explanation of inter-country variation in labour-force participation. Regarding the economic situation, the explained variance is 15.6%. Thus, labour-market structure seems to be most important for explaining regional variance, followed by educational attainment and the economic structure when entering the labour market.

Given all structural indicators in the summary model 6, explained variance on the country level increases to 82.4%. Contrary to model 2, we find significantly negative effects for the indicators of the age structure which confirms both Easterlin's hypothesis on intragenerational competition and the hypothesis of intergenerational substitution: The probability of labour-force participation of older men decreases with comparatively large cohorts being 50 to 64 years old and with large cohorts of young people. Obviously, these effects turn out just under control of other structural variables. Testing for several interactions between the macro-level indicators did not show any significant relation although the indicators are correlated. Stepwise introduction of the macro-level variables reveals educational attainment of the aged to be responsible for the significant effect of age structure. This is in line with both intra- and intergenerational competition. Assuming a constant level of educational attainment in the countries under investigation, both become evident. Without

controlling for education on the macro-level, competition within and between cohorts is concealed as countries differ with regard to their educational structure.

Transition to retirement

Table 3 presents results from the multilevel logistic regression analysis of men's transition into inactivity. As most employment exits take place well before formal retirement ages, we restrict our analyses to men between the ages of 50 and 61 in the first wave of the data. On the national level, results for educational attainment are not reported as the share of graduates explains less than 1% of between-country-variation in early retirement probabilities. The share of service jobs among the elderly was dropped, as it does not add explanatory power to the labour-market conditions.

As the empty model shows, about 5.7% of the variation in the transition to inactivity in Europe can be explained by country-specific factors (model 0). Thus, about 94% of observed variation in the dependent variable can be attributed to individual-level characteristics.

The individual-level variables largely show the expected effects (model 1). In the countries under study, the likelihood of leaving the active labour force predictably increases significantly with age and in case of less than good health and is significantly reduced in case of third-level education compared to lower than secondary education. As to the household, the probability of labour-market exit is significantly decreased for respondents belonging to high income households. With an employed partner or when no partner is present, the probability of respondents' transition to inactivity is significantly reduced. Concerning job characteristics, employment exit is significantly less likely for self-employed men and for men satisfied with their job. For firm size, the public sector and the tertiary sector no significant effects are found, though the signs of the sector effects are in line with our expectations (model 2).

Table 3: Individual and socio-economic determinants of labour-market exit of males aged 50-61 in wave 1

	M0	M1	M2	M3	M4	M5	M6
Age 53-55		1.051***	1.073***	1.076***	1.071***	1.078***	1.089***
		(4.11)	(4.18)	(4.19)	(4.17)	(4.20)	(4.24)
Age 56-58		1.983***	2.004***	2.005***	2.003***	2.007***	2.029***
		(8.41)	(8.41)	(8.41)	(8.41)	(8.42)	(8.51)
Age 59-61		2.574***	2.645***	2.641***	2.648***	2.645***	2.664***
		(12.39)	(12.53)	(12.51)	(12.54)	(12.53)	(12.62)
Secondary education		-0.192	-0.206	-0.200	-0.211	-0.217	-0.288
		(1.00)	(1.06)	(1.03)	(1.08)	(1.12)	(1.48)
Third-level education		-0.304	-0.319	-0.312	-0.322	-0.345+	-0.421*
		(1.53)	(1.54)	(1.51)	(1.56)	(1.67)	(2.03)
Less than good health		0.402**	0.335*	0.338*	0.334*	0.330*	0.314*
		(2.86)	(2.33)	(2.35)	(2.33)	(2.30)	(2.19)
Log (HH gross income)		-0.505**	-0.385*	-0.393*	-0.386*	-0.397*	-0.422*
		(3.11)	(2.22)	(2.26)	(2.23)	(2.28)	(2.44)
Log (HH size)		-0.636**	-0.596*	-0.585*	-0.590*	-0.581*	-0.547*
		(2.71)	(2.51)	(2.45)	(2.48)	(2.44)	(2.29)
Partner employed		-0.485**	-0.414*	-0.411*	-0.414*	-0.414*	-0.440*
		(2.88)	(2.34)	(2.32)	(2.34)	(2.35)	(2.48)
No partner		-1.114***	-1.066***	-1.062***	-1.061***	-1.056***	-1.058***
		(4.75)	(4.49)	(4.47)	(4.47)	(4.44)	(4.46)
Self-employed			-0.726***	-0.720**	-0.729***	-0.705**	-0.678**
			(3.29)	(3.26)	(3.30)	(3.20)	(3.08)
Unemployed			-0.011	-0.008	-0.014	-0.007	-0.022
			(0.06)	(0.04)	(0.07)	(0.04)	(0.12)
Tertiary sector			-0.182	-0.180	-0.181	-0.170	-0.148
			(1.03)	(1.02)	(1.02)	(0.96)	(0.84)
Public sector			0.280	0.278	0.275	0.275	0.290
			(1.50)	(1.49)	(1.47)	(1.47)	(1.55)
25-199 employees			-0.094	-0.093	-0.093	-0.080	-0.066
			(0.49)	(0.49)	(0.49)	(0.42)	(0.35)
200+ employees			0.256	0.255	0.250	0.283	0.255
			(1.43)	(1.43)	(1.40)	(1.58)	(1.42)
Satisfied with job			-0.576**	-0.582**	-0.572**	-0.571**	-0.551**
			(3.10)	(3.13)	(3.07)	(3.07)	(2.95)
Share of males, 15-29 in 1970				0.720			1.320***
				(1.40)			(3.98)
TFR in early 1990s				-0.192			0.361
				(0.41)			(1.39)
Share of long-term unemployed males, 50-64					0.587		1.083***
					(1.23)		(4.03)
Share of male part-time worker, 50-64					0.202		-1.006**
					(0.42)		(2.73)
GDP in 1970						-1.380**	-1.102***
						(3.03)	(3.43)
Change in GDP 1970-2004						1.507**	1.099**
						(2.92)	(2.58)
Between-country-variance	0.198**	0.388+	0.324*	0.258*	0.267*	0.142***	0.019**
	(3.15)	(1.93)	(2.24)	(2.54)	(2.54)	(3.52)	(2.50)
Intra-class correlation (ICC)	0.057	0.105	0.090	0.073	0.075	0.041	0.006
Explained country variance				0.202	0.174	0.560	0.941
BIC		2111.6	2126.0	2140.1	2140.1	2133.8	2154.5
Observations	2406.7	2701	2701	2701	2701	2701	2701

Notes: Standardised beta coefficients; Absolute t statistics in parentheses; + p<0.10, * p<0.05, ** p<0.01, *** p<0.001
Source: SHARE, Version 2.3.0; own calculations

Under control of indicators from the age structure (model 3), the estimated country variance amounts 0.258 which is significantly different from zero and much smaller than in the model with individual and firm characteristics (model 2). About 20.2% of the between-country-variance in transition to retirement is explained by the indicators of the age structure, though the estimated effects of the two variables are not significantly different from zero when controlling for individual characteristics. Labour-market structures explain about 17.4% of the between-country-variance. However, neither long-term unemployment nor part-time work significantly affect the probability

of early retirement. Concerning the economic concomitants, explained variance is remarkably 56.0%. The effects of GDP in 1970 and its change until 2004 are statistically significant and show expected directions. A comparatively good economic situation when entering the labour market facilitates career opportunities. As a consequence, the probability of early retirement is lower in countries where the GDP was comparatively high when today's older workers entered the labour market. This long-term effect is offset by change in GDP between 1970 and 2004. The more GDP increased over time, the higher are today's country-specific early exit probabilities. These findings suggest that economically favourable circumstances at labour-market entry diminish early exit probability by stabilising careers, whereas economic upswing enhances wealth and therefore increases the likelihood of early exit.

Controlling for all structural indicators in the summary model 6, explained variance on the country level is about 94.1%. Cross-national variance depending on country-level differences is reduced to 0.6%. Additionally, model 6 reveals that the share of males aged 15-29 in 1970, long-term unemployment and part-time work affect the transition to retirement significantly. This result is in contrast to model 3 and model 5. Testing several interactions between macro-level indicators did not improve our model. Stepwise introduction of the single indicators reveals that economic concomitants determine the significance of these effects: A positive effect of long-term unemployment and a negative effect of part-time work only emerge under control of economic variables. A positive effect also appears for the share of 15- to 29year-old men in 1970, which again confirms Easterlin's hypothesis. The hypothesis of substitution is not supported for the transition to retirement, though.

5 Conclusion

In this article, we estimated the effects of individual and structural factors on labour-force participation and transition to inactivity for older men in eleven European countries, using the first two waves of SHARE. The application of multilevel methods allowed to estimate the share of variance in late careers that can be attributed to country-specific factors and to quantify the relative impact of specific structural backgrounds.

The share of variance in labour-force participation and labour-market exit which can be attributed to institutional characteristics is limited (7% and 5.7%). About 82% of the between-country-variance of labour-force participation and 94% of the cross-

national variance in labour-market exit in Europe can be attributed to country-specific factors, including demographic, economic, and labour-market structures. The unexplained regional variance of 18% in labour-force participation and 6% in labour-market exit may be due to unmeasured structural or institutional differences on the country level and/or due to cultural differences in, for instance, tastes towards employment in the late employment career.

Moreover, the results confirmed our key hypothesis of varying labour-force participation and transition to retirement of older men with country-specific characteristics. Cross-national differences in individual labour-force participation are mainly driven by the prevalence of country-specific long-term unemployment and the educational attainment of older employees. A large share of long-term unemployed decreases the probability of individual labour-force participation. From that, we have to assume that long-term unemployment is mainly involuntary and an exit to retirement is realised as soon as possible. Accordingly, long-term unemployment is positively related to early retirement, although this effect is not consistently significant in our analysis. In contrast, a large share of highly educated older men increases individual probability to participate in the labour market. This result is clearly in line with our hypothesis. It confirms the argument that a high share of tertiary educated men among the elderly reduces competition for low-skilled jobs where young and old workers are actual substitutes. Thus, it is hardly surprising that our hypotheses of intra- and intergenerational competition are only supported under control of educational attainment of older men. Controlling for the share of tertiary educated aged workers, the relative cohort size and the size of subsequent cohorts decrease individual participation probability as competition increases. Alternatively, varying country-specific educational attainment conceals these differences. In contrast to our hypotheses, economic concomitants play just a minor role in explaining cross-national differences in labour-force participation. This might be explained by generous welfare-state arrangements in which unemployment benefits keep jobless people in the labour market.

In contrast, economic concomitants play a major role in explaining cross-national differences in early retirement. In line with our hypothesis, GDP at labour-market entry is negatively related to early retirement. Workers in countries with a high GDP at labour-market entry show a comparably low probability to retire early. The development of GDP per capita between 1970 and 2004, however, forces a

withdrawal from working life. Workers show a higher probability to retire early in countries in which GDP had grown considerably. Therefore we might argue that economic expansion over these 35 years induced wealth in prospering countries. This again might encourage workers to realise a preference for leisure or governments to expand old-age benefits. Moreover, economic concomitants channel other macro-level indicators. Our hypothesis of intragenerational competition, for example, is only confirmed under control of them. Therefore, relative cohort size at labour-market entry only explains retirement behaviour if we assume constant economic concomitants.

Summing up, our analysis demonstrates that socio-economic structures explain cross-national differences in labour-force participation and early retirement to a fairly large extent. A final appreciation of the effects urgently requires additional control of institutional factors. Long-term unemployment, for example, is linked to employment protection legislation. So the question whether the estimated effect is due to the institutional regulation or to its social consequence cannot be answered so far. Moreover, a replication of the present study using different international comparable micro data such as the European Community Household Panel (ECHP) and the European Survey of Income and Living Conditions (EU-SILC) could test the reliability of our results.

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