Tampere University

Thomas Mayer

WHO WORKS BEYOND THE RETIREMENT AGE AND WHY?

A comparison between Austria and Germany with a focus on pension levels and institutional early retirement incentives

Faculty of Social Sciences
Master's Thesis
October 2020

ABSTRACT

Thomas Mayer: Who works beyond the retirement age and why?
Master's thesis
Tampere University
Joint Master's Degree Program Comparative Social Policy and Welfare
October 2020

Facing demographic ageing, Germany and Austria have reformed their old age security systems to be sustainable for the future. With reforms starting at the turn of the century, a trend towards later retirement has been set by these governments. Especially interesting for governmental bodies is the question, which factors determine retirement after the statutory pension age. Germany and Austria promote late retirement in order to keep their pension systems sustainable, despite having cut the benefits of their public pension systems drastically since the early 2000s. Using wave 7 of the Survey of Health, Ageing and Retirement (SHARE), this thesis compares Germany, Austria and a sample of all SHARE countries to determine which individual, occupational and institutional factors affect late retirement significantly. The results show that a key characteristic of determining retirement timing is age. The older a population gets, the more likely retirement is. This is especially true for Austria. Among German citizens, receiving public pension benefits decreases the odds of having income from gainful employment dramatically. Further, comparing both countries with the SHARE sample, a pattern for educational attainment is visible. The data shows that the odds of working in retirement increase significantly with a medium and high level of education.

Keywords: Retirement timing, late retirement, Austria, Germany, SHARE, Pension levels

The originality of this thesis has been checked using the Turnitin OriginalityCheck service.

CONTENT

Abstract 2

List of figures 5

List of Tables 6

1. Introduction 7

2. Retirement timing 9

3. Austrian pension policy 14

   1. Social policy and pensions in the 20th century 14

   2. Radical reforms in Austria at the turn of the century 15

   3. Latest policy changes 16

   4. Status quo 2020 16

4. Pension history in Germany 19

   1. The German pension landscape in the 20th century 19

   2. Paradigmatic reforms at the turn of the century 21

   3. Latest policy changes 23

   4. Status quo 2020 24

5. Pension reforms targeting later retirement 26

6. Methodology 33

   1. Data and Sample 33

   2. Measures 35

   3. Method 37

7. Results 39

   1. Descriptive results 39

   2. Logistic regression analysis 46

8. Discussion 54

9. Conclusion 58

10. References 60

1. SHARE Data Disclosure.....66

11. Appendix.....67

1. Descriptives.....67

2. SPSS Syntax 75

LIST OF FIGURES

Figure 1 Retirement Age 2005 - 2018 28
Figure 2 Employment rates by sex, age and citizenship 30
Figure 3 Employment rates by sex, age and citizenship 31
Figure 4 People at risk of poverty or social exclusion by sex 32
Figure 5 Percentage of people with income from gainful employment in the last year 35
Figure 6 Educational Attainment 39
Figure 7 Austria: Average Public Pension Income in EUR 41
Figure 8 Germany: Average Income from Public and Occupational Pensions 43
Figure 9 Is Household Able to Make Ends Meet 45

LIST OF TABLES

Table 1 Austrian Pension Pillars and Tiers 18
Table 2 German Pension Pillars and Tiers 22
Table 3 Case numbers (n) of independent variables 40
Table 4 Coefficients in the regression model Austria 46
Table 5 Coefficients in the regression model Germany 47
Table 6 Coefficients in the regression model SHARE 49

1. INTRODUCTION

Many European welfare states have undergone a policy shift from allowing and promoting the retirement of older workers before the statutory retirement age to minimizing incentives to retire early by introducing various policy measures (Hinrichs 2000; Ebbinghaus 2011b). This policy shift, largely taking effect in the 1980s, has been the result of changed societal circumstances. Having faced increased unemployment due to the oil crises in the 1970s, Austrian labor market policy dismissed older adults from the labor market to retire early in order to relieve pressure from the labor market (Obinger and Talos 2010). With an increasing share of older adults aged 50+ years in the populations of industrialized nations, as well as low participation rates in labor markets combined with low fertility rates, welfare states are challenged to reform their pension systems to withstand demographic ageing and be sustainable in the longer term (cf. Schmidthuber et al. 2016). Policies targeting this ranges from reforms such as increasing the statutory retirement age, closing early retirement paths and retrenching public pension benefits to active labor market policies, which incentivize employers to hire older workers (cf. Hofäcker and Naumann 2015).

Traditionally, a differentiation can be made between Bismarckian and Beveridgean pension schemes (Ebbinghaus 2011a). Bismarckian pay-as-you-go pension schemes are usually designed to have a large first, public contribution-financed pension pillar with the second and third pillar only supplementing these state pensions (ibid.). In this case, pensioners rely on the contributions made by those in the work force (ibid.). In contrast, in Beveridgean systems the first pillar only provides a flat-rate pension to lift older citizens, who are not able to work due to various reasons, out of poverty (ibid.). Pensions are usually tax-financed and provide incentives to take out private insurances (ibid.). Thus, in the Beveridgean pension schemes, the second and third pillar are already important (Anderson 2015).

Germany and Austria, two continental, Bismarckian welfare regimes (Esping-Andersen 2007), are in a similar need to make their pension systems financially sustainable for the future. Both countries are working towards keeping older adults aged 50+ in the labor market as long as possible and guaranteeing the financial sustainability of their public pension schemes while cutting benefits, but with different measures (Ebbinghaus 2011a).

Literature tells us that lower pension benefits, atypical forms of work as well as gaps between jobs affect income in old age (Mayrhuber et al. 2019; Möhring 2015; Bäcker 2018a; OECD 2019). Germany and Austria have seen an increase in the share of citizens working beyond 65 since the early 2000s (Eurostat 2020a, 2019). An important research gap in this regard is the question of why people retire late. To date, scientific literature has explored factors of retirement timing, barely focusing on those who work past the retirement age. Virtually no empirical evidence is found in regard to Austria. Can we see differences in education, sector of employment or the number of years in employment in those who work beyond the retirement age? The aim of this master thesis is to give a review of the literature looking at factors affecting retirement timing. Subsequently, it provides a descriptive overview the pension systems in Austria and Germany tracing pension policy and reforms in the past.

Primarily, though, this study explores the role of pension levels (net replacement rate), and of individual (gender, education) and occupational (sector of employment) factors and how they influence the timing of retirement. Showing crucial similarities in their social and old age security system, Germany and Austria will be compared using data from the Survey of Health, Ageing and Retirement (SHARE) wave 7. SHARE provides the necessary tools to analyze all factors mentioned above in depth and investigate links between those factors. Separate binary logistic regression models will be created to highlight the importance of each factor affecting retirement timing in each country. Additionally, the regression models for both countries will be compared with a model for all SHARE participating countries.

This paper is structured as follows: First, I give an overview of my hypotheses and previous literature supporting and negating my assumptions. Second, a short overview of the two pension systems and their reform paths will be given, resulting in a comparison of Austria and Germany. Most importantly, the paper will provide insight into reforms focusing on late retirement and pension system sustainability. Third, wave 7 of SHARE published in 2019 will be discussed. Afterwards, operationalized dependent and independent variables will be explained. Fifth, the method in use will be discussed shortly. Subsequently, results of the empirical analysis of the hypotheses are presented. At last, a discussion of the findings and a conclusion will finish the paper.

2. RETIREMENT TIMING

This paper contributes to the scarce literature on retirement timing in Austria. It compares the influence single demographic/individual, occupational and institutional factors have on late retirement in Austria to their influence in Germany. Both countries have formerly shown similar features in their social security systems. Up to the 1990s, Austria and Germany based their pension old-age security system primarily on the pay-as-you-go (PAYG) public pillar, which follows the equivalence principle (Blank et al. 2016a). With Germany shifting to a multi-pillar pension system and changing the goal of the public pension pillar to poverty alleviation (Ebbinghaus et al. 2011) and Austria staying with a single-pillar scheme and income maintenance (Blank et al. 2016a), a comparison of pension levels becomes quite interesting.

Whereas previous literature in the field of retirement timing has generally addressed these three separately or institutional and individual factors combined, the approach taken in this paper allows combining all three categories. The institutional category focuses on retirement in terms of pension levels and incentives to work beyond the statutory retirement age. As for the occupational level, a *sector of employment* variable will be introduced to the analysis. As will be discussed in more detail later, the literature suggests that sector of employment is influential in the retirement decision. The individual level comprises educational attainment as independent variable as well as employment history. Specifically, the analysis will look at years in employment throughout one's life and determine if this correlates with working in retirement.

In the past empirical research has focused on Germany and aggregated data on EU member states. There is no empirical evidence focusing on Austria specifically so far. In order to contribute to the scientific literature on retirement timing in Austria, this thesis utilizes wave 7 of SHARE, allowing exploring the latest data on retirement timing that is available. Logistic regression analyses will be used in order to investigate which factors are important in deciding to retire late. By creating separate regression models for Austria and Germany, the vast difference in importance of specific factors in both countries can be identified. Afterwards, both countries will be compared to a sample consisting of all SHARE participating countries. In this sense, four hypotheses regarding late retirement will be examined.

Blank et al. (2016b) state that public pension retrenchment has occurred by far more drastically since the 1990s in Germany than it has in Austria. Germany's government started promoting voluntary funded occupational and individual pension schemes at the turn of the millennium (e.g. the so-called Riester and the Rürup pension) and is widely seen as having been successful in reversing their early retirement pension scheme into a late retirement scheme (Blank et al. 2016a), although at the cost of citizens' welfare (Blank et al. 2016b). This reversal has been proven to be the result of the cancellation of various early retirement paths, deductions from later benefits in the case of early retirement (ibid.) as well as an increasing statutory retirement age (Bäcker 2018b). According to Blank et al. (2016b), this public pension benefit retrenchment leaves behind much lower benefit levels especially for less educated workers, which occupational and private pension schemes cannot improve properly. Whereas there is a wide consensus that this shift to a multi-pillar pension scheme increased and still increases old-age income inequality and poverty among pensioners (Bäcker 2018a; Blank et al. 2016a; Ebbinghaus 2018), it also decreases the level of security of current workers (Bridgen and Meyer 2014). Additionally, Bäcker (2018a) argues that very low income is most prevalent among single persons with 6% of single women and 5% of single men having an income lower than 700€ per month (including public, occupational and private pensions).

Austria has reformed the pension system within the margins of the public pay-as-you-go pension system, keeping the focus on the first pillar (Blank et al. 2016c). Austria made a switch to defined-benefit pension accounts starting in 2005 for those born after 1955 (Türk 2019). Crucial in this regard was the extension of the assessment period for the formation of the pension assessment base from 15 to 40 and later 45 years for all citizens (Mayrhuber et al. 2019). In addition, Austria has also reformed other significant parts of its pension system, which include tightening criteria for the extension of insurance periods and increasing deductions in case of early retirement. Temporary disability pensions were abolished, introducing rehabilitation allowance and various activation measures for older adults (Türk 2019). These reforms have had a negative impact on the Austrian pension level, more specifically the new pensioners, who are now increasingly facing lower benefits (Mayrhuber et al. 2019). It is becoming ever more important to accomplish a full-time work biography without gaps in between jobs to keep pension benefits high (ibid.). Still, we see that the average public pension net replacement rate is 80% of lifetime earnings and the second and third pillar are seen as a sole top-up to the already high benefits (Blank et al. 2016c).

I hypothesize that there will be significant differences in the 'need-factor' of German and Austrian citizens, as Hofäcker and Radl (2016) coined the term. The need-factor describes the financial need to extend the time in the labor market. It will be significantly more necessary for German citizens than it will be for Austrians to work beyond retirement age as a result of different public pension levels (Hypothesis 1). In this analysis, pension income from all pension insurances will be investigated. The literature suggests that occupational and private pensions are not able to fill the gap in old-age income (Ebbinghaus 2018; Blank et al. 2016b) and more income inequality in old age can be found in countries in which private funded pension schemes are more important (Been et al. 2017). Correspondingly, Axelrad (2018) argues that *country of residence* is also associated with retirement timing. Using multiple waves of SHARE (wave 2, 4 and 5), she finds that people in Austria were significantly less likely to retire late than in Germany (ibid.). This finding is in line with research by Börsch-Supan et al. (2009, 353) who find that the generosity of the social security and pension system 'is significantly and positively associated to the retirement probability'. Exploring three waves of the German Ageing Survey (1996, 2002, 2011), Hofäcker and Naumann (2015, 477) find that the share of citizens working beyond the age of 65 has 'almost tripled from 4.5 to 12%', whereas no information on the situation in Austria is given in their paper.

Second, and following Wiß et al. (2019), I hypothesize that there will be significant differences in the retirement age (after the statutory retirement age) between sectors of employment (Hypothesis 2). Wiß et al. (2019) make use of SHARE's wave 3 and find that people in the service and primary sectors were more likely to retire later in comparison to people who worked in other sectors (e.g. industry and manufacturing). They analyze all 13 participating countries utilizing linear regressions (ibid.). Thus, they do not consider institutional factors such as the statutory retirement age or pension levels in their analysis.

Similarly, De Preter et al. (2012) analyze data from wave 1 and 2 of SHARE with 11 participating countries to establish if older workers employed in industry and manufacturing retire earlier than those in the service sector. The authors applied survival analysis in order to receive information about correlations between retirement timing and sector of employment. Their results reveal that only workers in industry and in the financial sector tend to time their retirement earlier than workers in the service sector do (ibid.). According to De Preter et al. (2013), results regarding workers in the manufacturing sector were not significant, highlighting the importance of sociodemographic factors. In their analysis, Hofäcker and Naumann (2015) differentiate between the primary, secondary,

tertiary and public sector and find that workers in the service and agricultural (primary and secondary) sector tend to work longer than those in the industrial sector in Germany.

Lastly, I hypothesize that workers in Austria with a high level of education are more likely to retire after the statutory pension age than those with medium and low levels of education (Hypothesis 3). For Germany, I hypothesize that workers with low and high, rather than medium, levels of education work beyond retirement age (Hypothesis 4). For Austria and Germany, I argue that late retirement among higher educated workers happens voluntarily, rather than out of financial reasons, whereas those with low levels of education in Germany retire late due to need factors. Generally, the literature suggests that education is a key sociodemographic factor affecting retirement timing. Previous literature finds ambiguous results for the relationship between education and retirement timing in different countries.

Hofäcker et al. (2016) who analyzed Germany in SHARE's wave 1 and 2 point out that whereas higher educated workers work the longest, earlier retirement common among workers with lower levels of education might not be voluntary but often rather health-related. For those with lower levels of education, they argue that earlier exits are due to 'eligibility to public pensions, which may be because they have accumulated necessary pension contribution years at a younger age, given their shorter educational history' (ibid., 53). In contrast, workers with higher levels of education in England and Japan tend to retire earlier and voluntarily, which, according to Hofäcker et al. (2016), points to higher educated workers having more financial resources.

Hofäcker and Naumann examined Germany specifically using the German Ageing Survey (waves 1996, 2002 and 2011). Their study shows that higher educated workers 'show a significantly higher likelihood to continue working up to or beyond the age of 65' (Hofäcker and Naumann 2015, 477), which is the statutory retirement age in Germany.

Analyzing European Union Labor Force Survey data, Hofäcker et al. (2019) state that those with lower levels of education in Germany retire late (at age 65+) due to financial reasons, while highly educated workers name intrinsic reasons for staying in the labor market longer. In her study, Scherger (2013) focusses on those working beyond the retirement age in Germany and England. Based on data from the German Ageing Study (2008), she finds a positive correlation between education and working beyond the statutory retirement age: Those with higher educational attainment tend to work beyond 65 (ibid.). Contradictory to the findings of Hofäcker et al. (2016), Scherger's findings suggest

a positive correlation between education and working beyond the retirement age. Hofäcker et al. (2016) have analyzed the first three waves of the English Longitudinal Survey of Ageing (ELSA) for their results on England, whereas Scherger (2013) has examined wave 4 of the same survey.

Comparing Germany, Denmark and Sweden based on data from Eurostat, Larsen and Pedersen (2017) find evidence of a u-curve in retirement timing for those aged 65 to 69: Men in Germany and women in Denmark with lower and higher, rather than medium, levels of education tend to postpone retirement. In line with my argument, they state that this 'could be interpreted as a reflection of 'necessity' to work for the 'low' educated and 'preferences' for work in the 'high' education group' (Larsen and Pedersen 2017, 24). This does not apply to Sweden, however, where participation rates among those with high or medium levels of education in this age group are significantly higher than of those with low levels of education (ibid.). Hank and Korbmacher (2013) claim that higher levels of education and retirement timing correlate positively with later retirement for women but not for men according to their discrete-time logistic regression results. Further and using waves 2, 4 and 5 of the SHARE, Axelrad (2018) suggests there is evidence that workers with high levels of education are less likely to retire before the statutory pension age. De Preter et al. (2013) complement that, finding evidence that those with secondary and tertiary education are significantly more likely to remain in the labor market longer than lower educated workers. Lastly, Pleau (2010) points out that highly educated workers in the USA are more likely to reenter the labor market after retirement. She explored data from the nationally representative Health and Retirement Study.

3. AUSTRIAN PENSION POLICY

Austria has a long history of consensus-based policy making lead by the grand coalition, which consists of the Social Democratic (SPÖ) and the Christian Democratic Party (ÖVP). These two parties governed in conflict in the early days of the democracy in the early 1920s but have developed a cooperation based on compromises (Obinger et al. 2010) after World War II. Apart from the governmental parties, so-called social partners are usually included in the policy-making process, to give a voice to on the one hand employees (Arbeiterkammer as well as Gewerkschaftsbund) and on the other hand employers (Wirtschaftskammer).

1. Social policy and pensions in the 20th century

Austria has historically had a very generous pension system. During the 'Golden Age' of welfare expansion in the 50s, 60s and early 70s, the Austrian government and the social partners agreed on a wide range of welfare benefits such as early retirement benefits in case of unemployment as well as for those with long insurance records (Obinger et al. 2010).

Under the Social Democratic administration under Bruno Kreisky in the mid-1970s, which held an absolute majority of votes, retirement age was fixed at 65 years of age for men and 60 years for women. Standard insurance could be obtained with 15 insurance years. The basis for calculating the monthly number of Schillings citizens would receive was the average salary from the last five years until retirement. With the single party government and Social Democrat absolute majority in parliament, Keynesian economic and social policy was implemented in Austria with low unemployment but mounting public debt (Obinger and Talos 2010). This showed welfare benefits at first mostly in labor market policy such as the reduction of working hours and the extension of holiday leave to four weeks in 1976 (Tálos 1981) in a strong cooperation with the social partners.

After the second oil price shock (in the early 1980s) and mounting debt, the Kreisky administration introduced the first phase of welfare state retrenchment. This also led to the SPÖ losing the absolute majority of votes and starting a short-lived government with the right-wing Freedom Party (FPÖ).

Under a new coalition between SPÖ and the People's Party (ÖVP), moderate and balanced reforms were enacted, such as raising contributions for pension insurance and still facilitating early retirement in case of unemployment and invalidity (Obinger et al. 2010). The social partners could

prevent more drastic retrenchment measures (ibid.). As a sign of consensus-based politics and social partnership, the Grand Coalition worked to tackle economic as well as demographic challenges and still upheld comparatively generous benefits for their citizens. With their watered-down reforms, the government was able to reduce public debt and enter the European Union. In the long term, though, Austria was not prepared for demographic ageing and the burden it would exact on the state budget.

2. Radical reforms in Austria at the turn of the century

The turn of the century marked a radical change in power as SPÖ and ÖVP lost a significant number of votes in the 1999 elections, which led to a coalition between the ÖVP and FPÖ (2000 – 2006). This coalition neglected the social partnership, did not negotiate reforms with the social partners and, in doing so, changed the policy-making process drastically. This period was marked by a strict focus on supply-side oriented economic policy and putting the welfare state and the welfare of citizens in second place.

The new government adopted neo-liberal measures and set out to push through their agenda without considering the long-lived tradition of cooperation with social partners. According to Obinger et al. (2010, 53f) the new government changed the political game by reducing the number of labor representatives in the Federation of Social Insurance. Before, there was imbalance in the representation of capital and labor with more representatives representing labor and less representing capital. Now, the representation of labor and capital was balanced (Obinger et al. 2010, 53f). The FPÖ-ÖVP coalition also removed the social-democratic president of the Federation of Social Insurance.

The most striking reforms happened in the field of pension policy in 2003 and 2004 with the general pensions act (Allgemeines Pensionsgesetz, APG) and the personal pension account. Both reforms extended the period for benefit calculation first to 40 years and then to 45 years of work, which would result in a fixed 'benefit level of 80% of previous average earnings for a person retiring at the age of 65 with a 45-year employment record' (Paster 2014, 978). A cap on losses of 10% was applied (ibid.). Obinger and Tálos (2006) explain that, without this cap on losses, enforced by the already neglected social partners representing employees, 'the reform would have caused benefit losses of up to 30%' (cited in Paster 2014, 978). Another compensation measure allowed citizens with long periods of work (more than 45 years) to still be able to retire early without deductions (Obinger et

al. 2010). Furthermore, the contribution rate for the self-employed was raised to 17.5% (Knell et al. 2006). Most importantly, with the personal pension account the calculation and organization of the public pension pillar was changed. The new personal pension account (Pensionskonto) replaced the old way of calculating later pension benefits under the above-mentioned new criteria (the 80/45/65 rule) and was limited to new credited periods after 1.1.2005. This made the calculation of pension benefits in fact even more difficult, since a parallel calculation was needed for credited periods before and after the new law took effect (Redl et al. 2015).

3. Latest policy changes

After the FPÖ-ÖVP coalition, another Grand Coalition came into power again. The new SPÖ-ÖVP coalition introduced a means-tested basic income and a minimum wage. Pension benefits were raised again and improvements in social protection were made for citizens in new forms of employment, for instance quasi-freelancers (Bundeskanzleramt 2007).

In 2016 it was decided to let the path of early retirement on grounds of long insurance record (Langzeitversichertenpension) expire in 2017 (Federal Ministry of Labour, Social Affairs and Consumer Protection 2016). Until then, eligibility criteria were tightened, which gradually increased the age of earliest possible retirement for women from 57 to 62 and men from 60 to 62 (ibid.).

Regarding the personal pension account, credited periods before 2005 were converted to become a starting credit in the pension accounts for all as of 2014. This was meant to make pension calculation easier and transparent for the population.

Eligibility criteria for invalidity pensions have also been tightened. The temporary invalidity pension retirement path has expired and has been replaced with the right to funding for rehabilitation measures. The indefinite invalidity pension, though, remains.

4. Status quo 2020

At present, the pension system in Austria is following the General Pensions Act using a personal pension account. The Austrian public pension system provides two distinct groups of pension benefits: Own pensions and survivor’s pensions. In the following, only the own pensions will be explained in more detail.

Own pensions include the regular old-age pension, early retirement pension on grounds of long-term insurance contributions, corridor pensions, manual labor pensions and invalidity or occupational disability pensions (Federal Ministry of Labour, Social Affairs, Health and Consumer Protection (BMAGSK) 2018).

Regular old-age pensions can be claimed when having reached the statutory pension age, which is 65 for men and 60 for women, with the retirement age for women being gradually increased to 65 starting 2024 until it has reached 65 in 2033. According to the Ministry of Social Affairs (2018), in order to receive pension benefits, insurees must have accumulated a minimum of 180 contribution months, which accounts to 15 years. Of these 15 years, seven need to be derived from gainful employment. For claimants born after January 1, 1955, the General Pensions Act applies, providing the personal pensions account. In addition, periods of unpaid care work can be considered for pension contributions and periods of education can be bought and are credited as contribution periods of a voluntary pension scheme (ibid.).

Early retirement on grounds of long-term insurance contributions (Hacklerregelung NEU) can be requested by men who have collected 45 contribution years and lets them retire at the age of 62 without abductions. This does not apply to women.

Under the concept of corridor pensions (Korridorpensionen) claimants (men) can retire early when having accumulated at least 40 years of insurance at the age of 62. Deductions account to 5.1% per year of early retirement or 0.425% per month (Bundesministerium für Arbeit, Soziales, Gesundheit und Konsumentenschutz (BMASGK) 2019b). There is a cap on deductions of 15.3%. This does not apply to women.

Manual labor pensions (Schwerarbeitspensionen) enable workers who perform physically demanding work to retire already at the age of 60. With a minimum insurance period of 45 years, at least 10 of the last 20 years must have been spent in physically demanding work (ibid.). Deductions account to 4.2% per year (0.35% monthly) and a maximum of 13.8%.

The new invalidity pension scheme (Invaliditätspension neu) is awarded only when permanent disability or incapacity to work is ascertained. This type of public pension aims to reduce the number of invalidity pensions and help workers with health issues reintegrate into the labor market. Temporarily seriously ill people will obtain medical treatment and rehabilitation from regional health

insurance funds (Federal Ministry of Labour, Social Affairs, Health and Consumer Protection (BMAGSK) 2018).

Austria	**First Pillar** State Pension	**Second Pillar** Occupational Pension	**Third Pillar** Private Pension
Income (age men: 65, women: 60)	89%	7%	4%
Third tier (topping up/ replacement gap)		based on the BPG (Betriebspensionsgesetz); 4 types: collective company insurance scheme; direct payments (voluntary); life insurance policies (subsidized); pension fund commitment (DB or DC; subsidized)	Zukunftsvorsorge (2003-): voluntary, tax-privileged investment fund
Second tier (income maintenance)	*Statutory pension system* (PV) based on ASVG and APG: mandatory for employees parity social contributions (with income limit); contributions-based, earnings-related PAYG DB (equivalence)		
First tier (poverty alleviation	tax-funded income-tested top-up for low earners; means-tested top-up for low earners with 30 or more insurance years		

Table 1 Austrian Pension Pillars and Tiers

The public pension scheme in Austria is by far the most important source of income in retirement for older adults. As table 1 shows, the public pension makes up about 89% of the income of retirees, whereas income from occupational and private pensions is at under 10%. To date, the public pension aims to ensure a decent standard of living from earnings of one's working life. The Austrian pension system is a clear example of state pensions crowding out other forms of pension earnings due to their generosity.

4. PENSION HISTORY IN GERMANY

The conservative welfare state has reformed its pay-as-you-go pension scheme from a single-pillar system, heavily relying on public pensions and therefore the contributions of those in gainful employment, to a multi-pillar scheme, putting more risk on the individual with the state taking less responsibility.

In the following, as done in the last chapter, key turning points in German pension policy will be described briefly. The chapter will close by portraying the current state of the pension system.

1. The German pension landscape in the 20th century

As in Austria, a general trend towards benefit retrenchment is visible already since the late 1980s (Wörz 2011). The 1989 Pension Reform Act resolved the phasing out of several pension types, such as the old-age pension for women, or old-age pensions due to unemployment, and introduced deduction for retirement prior to the statutory retirement age while phasing in higher statutory retirement ages of 65 years (ibid.). Further the pension calculation switched from gross to net wage indexation (Schludi 2005). Other major retrenchment measures showed a decrease of credited periods of tertiary schooling from 13 to a maximum of 7 years at a maximum of 75% of average earnings. As a countermeasure, longer periods for child-raising were credited (at 90% of average earnings for the first 4 years for babies born after 1991) and part-time pensions before reaching the statutory retirement age were introduced. These measures and the curtailment of non-contributory benefits (except the extension of credited periods of child-raising) prevented the estimated contribution rate to increase from a level of 18.7% in 1990 to more than 36% in 2030 (Schludi 2005). Instead, the contribution rate would increase to (only) 27% with these reforms (ibid.).

As a result of German reunification, the 1990s showed pension reforms under the conservative-right coalition which accelerated the speed of retrenchment for the coming years and targeted pension spending stabilization in the long-term (ibid.). The pension system was extended to the East German Länder and due to the higher employment rate of women in the German Democratic Republic (GDR), the share of pension benefits for women also increased drastically (ibid.). Schludi (2005) describes the most dramatic development being the sharp decline of employment levels due to the collapse of the GDR. Because Germany wanted to join the European Monetary Union, which had a 3.0%

budget deficit criterion, more retrenchment measures had to be taken as the fiscal pressures of reunification caused a budget deficit of 3.4% in 1996. In a joint effort by the government and the social partners, the so-called Alliance for Jobs, the 'elderly part-time work' was introduced, which aimed at reducing the misuse of legal early retirement options and at reducing youth unemployment (ibid.). As for the pension due to unemployment, the age limit was to be gradually increased from 60 to 63 years, with a reduction of 3.6% per year of early retirement (ibid.). For the unemployed people at the time, this would not apply. After the elections in 1996, the Growth and Employment Promotion Act was presented, which was to cut sick pay from 100% to 80% and lower employment protection rules. Pension policy further included cuts in non-contributory benefits and the phasing in of the increased retirement age for women (65) by 2001 instead of 2012. Credited periods of tertiary education were reduced to 3 years. This reform introduced the end of pension consensus and led to massive protests organized by the trade unions. Since the 1996 pension reform did not have the impact hoped for in the long-term, the Kohl government introduced the Pension Reform Act in 1997, introducing a demographic factor into the pension formula by which increases in life expectancy were taken into account and which would lead to even lower pension levels (64% instead of 70%, ibid.). Further, eligibility criteria for disability pensions were tightened and the retirement age for disability pensions increased to 63 years (Wörz 2011). Also, the value-added tax was increased from 15 to 16% (1% increase) (ibid.).

In the elections in 1998 the power structures changed in favor of the Social Democrats and the Green party, who both did not support the pension retrenchment measures of the Christian Democrats from the 1990s. In charge, the Schröder government got rid of the demographic factor and suspended the reform of the disability pensions (Schludi 2005). Social insurance coverage was expanded to those in atypical forms of employment and the federal subsidy to finance the pension scheme was increased. Through personnel changes in the Social Democratic party as well as the pressing need for cost-containment and reforms, Schröder drastically reduced the assessment base of pension contributions. Further, Schludi (2005, 147) explains that 'the Schröder government decided to suspend the indexation of net wages for two years and to switch to consumer price indexation instead', which made pension levels fall even more than with the demographic factor, from 70% to 67.6% in two years.

2. Paradigmatic reforms at the turn of the century

The proper, paradigmatic, and in this paper crucial, reform of the German pension system followed a few months later with proposals by Minister of Social Affairs, Walter Riester. Riester and the newly elected Finance Minister, Hans Eichel, as well as Gerhard Schröder himself were in favor of conservative fiscal policy and modernizing the pensions (ibid.). According to Schludi (2005), Riester suggested the expansion of the pay-as-you-go pension scheme to rely more heavily on the second, occupational, and specifically the third, private, pillar. The first suggestions included a supplementary private funded pillar on a mandatory basis financed by workers' contributions, a minimum protection system within the statutory public insurance and another reform of disability pensions. Further, married women should be able to claim their own independent pension (ibid.). These suggestions had to be debated with all veto players, namely the trade unions, other major parties (such as the liberal FDP and the conservative Christian Democrats) as well as the left wing of the ruling Social Democratic Party. The final reform included the following changes (based on Schludi 2015, 150f and Wörz 2011, 28):

- A return to net wage indexation in 2001.
- Cuts in the public pillar with a cap on benefit retrenchment. Public pensions were not allowed to fall below a net replacement rate of 67%.
- The fully funded private pillar was made voluntary and promoted by the government in the form of tax-free allowances fixed at 4%. The government therefore established so-called 'Riester-Renten'. Families with children should receive special supplements if they invest in private pension funds.
- Cuts in widows' pensions.
- The taxable share of pensions was raised to 50% in 2005 and to 100% by 2040.
- The introduction of a means-tested social assistance within the public pillar.

According to Ebbinghaus and Neugschwendner (2011) a change to a multi-pillar pension system is recommended by international organizations such as the World Bank and the EU. These models are recommended to look as follows:

'the first [pension] pillar serves essentially redistributive purposes by providing a minimum income in old age, the second is an earnings-related pension tied to employment performance, and the third is a 'topping up'' (Ebbinghaus and Neugschwender 2011).

Germany	**First pillar** State pension (SP)	**Second pillar** Occupational pension (OP)		**Third pillar** Personal pension (PP)
		Collective agreement	Employer commitment	
Income (age 65+)	86% (East 96%)	8% (1%)		6% (3%)
Third tier (topping up/ replacement gap)		• public sector: special collective scheme for public employees (PAYG NDC); • private sector: 5 types of voluntary Ops (DB or DC) with tax incentives; • collective agreements in some private sectors; • Earnings-conversion (Entgeltumwandlung)		• *Riester pension* (2002-): voluntary earnings-related, subsidies for low income groups, funded DC • *Rürup pension* (2005-): tax incentives, DC
Second tier (income maintenance)	*Statutory pension syste*m (GRV): mandatory for employees; parity soical contributions (with income limit); contribution period earnings-related PAYG DB (*equivalence*); child credits (tax-financed)	*special statutory schemes*: • civil servant pension pay (Beamtenversorgung) • farmers' income support • mandatory schemes for free professions (Berufsständische Versorgungswerke)		
First tier (poverty alleviation)				
	means-tested (social assistance, since 2003:) minimum income in old age (Grundsicherung im Alter), tax-financed			

Table 2 German Pension Pillars and Tiers

The German government in the early 2000s followed these recommendations and changed its pension system accordingly. In doing so, the German old age security system became more

sustainable over the long term. The German pension system is summarized by Ebbinghaus et al. (2011) in Table 2.

3. Latest policy changes

With the goal of keeping contribution rates under 20% until 2020, the minimum pension levels have decreased since the turn of the millennium. Further reforms after the paradigmatic Riester reform have targeted early retirement (Hofäcker and Naumann 2015). For instance, from July 2005 the age at which old age pensions due to unemployment can be received at the earliest has been increased from 60 to 63 years (Bäcker 2018b). Later, in 2012, an increase in the statutory regular pensionable age was brought into effect (ibid.). As of 2029, the statutory retirement age will be 67 years. All early retirement schemes have been given deductions of up to 14.4% (ibid.). Further, the minimum retirement age for the old age pensions for those with long contribution periods has been increased to 63 years (ibid.). As of 2017, beneficiaries of 50 years and older are allowed to make additional contributions to the public pension (ibid.).

In addition, Germany has enacted measures to increase employment in old age (50+ years), such as providing further training allowance for older adults and giving grants to businesses which employ older adults who have been unemployed before (ibid.).

As of 2001, invalidity pensions have been changed into two separate pension entitlements: 1. For those not being able to work 3 hours a day (full reduced earning capacity pension) and 2. For those who are able to work between 3 and under 6 hours a day (half reduced earning capacity pension) (ibid.). The minimum eligible age was 63 years and was changed to 65 years without deductions in 2012. Making use of this retirement option before the age of 65 means deductions from the individual pension of a maximum of 10.8% (ibid.).

In order to make the transition from gainful employment to retirement easier, Germany introduced a new retirement path in 2017 (Bundesministerium für Arbeit und Soziales 2020). This new path towards retirement lets beneficiaries reduce their work hours before having reached the statutory pension age and receive parts of their pension entitlements early.

Voluntary occupational pensions have also been reformed. From 2002 occupational pension entitlements were vested, first with a minimum period of 5 years that the beneficiary was employed with one employer (at an age of 30) (Bäcker 2018b).This has been reformed so that a person’s

entitlements are now vested after 3 years with the same employer and a minimum age of the employee of 21 (ibid.). Pension entitlements could be taken along to a new employer as of 2005 (ibid.).

4. Status quo 2020

The current German pension system is based on a multi-pillar model which focusses on individual savings plans for old age security and in which the state pension (first pillar) serves as a means for poverty alleviation (Ebbinghaus et al. 2011).

As shown above (Table 2), the German state pension makes up about 86% of income in retirement. The state pension has been expanded to more professions as well as those working few hours a week (so-called mini-jobbers) (Bäcker 2018b). In 2018, 83,8% of all dependent labor force were insured in the statutory pension (Statistisches Bundesamt 2020). The benefits have been retrenched in the past two decades, leaving the gross replacement rate at 46% of lifetime earnings (Bäcker 2018b). Criteria for specific early retirement paths (such as the reduced earning capacity pension) have been tightened whereas others have been reformed (for instance old age pension for long insurance periods can be used from 63 years but only with deductions (ibid.). In the statutory pension, as far as insurance-legal requirements are fulfilled, the insured can retire either early with deductions, or at the regular retirement age, which is being gradually increased to 67 years until 2029 (Schmitz-Kießler 2019). When making use of early retirement, not only are there deductions but there is also an additional earnings limit (ibid.). Another possibility to retire earlier has been introduced in as recent as 2017 with the flexibilization of the transition into retirement by being able to receive a part of the pension benefits (so-called partial pension) already before the statutory retirement age and stay in the labor market (Bäcker 2018b). Working beyond the statutory pensionable age has no negative effects on individual public pension benefits and no additional earnings limits (Schmitz-Kießler 2019).

The German statutory pension system contains two pension paths for people with reduced earning capacity (Bäcker 2018b). The full reduced earning capacity pension and the half reduced earning capacity pension. These also carry additional earnings limits (Schmitz-Kießler 2019).

Occupational pensions have seen a massive expansion in the 21st century. For instance, employers introducing an occupational pension scheme receive tax benefits. For employees, the vesting period for being able to switch employers and keep the accumulated pension benefits has been gradually

been removed. After working for the same employer for three years at a minimum age of 21 years, employees are now able to transfer their accumulated occupational pension benefit to a new employer (ibid).

Private pension schemes such as the Riester or Rürup pensions have been made more customer friendly (ibid.). For instance, deferred compensation is now permanent and there is a cap on costs for changing private pension funds (150€ max.) (ibid.). There is also the possibility to take accumulated capital from the Riester pension for building property ownership (ibid.).

5. PENSION REFORMS TARGETING LATER RETIREMENT

Retirement timing of older adults is rather individual, with visible patterns in different groups of citizens across countries. As will be discussed later, this is a result of not just individual choice but also depends on the institutional setting as well as occupational pension benefits. For Germany, Hofäcker and Naumann (2015) observe a trend towards late retirement with people staying in the labor market well after the statutory retirement age. Many would be eligible to retire with pension benefits, but still stay in the labor market. Reasons for late retirement include financial and non-financial aspects (Hofäcker et al. 2019), the individual ability (e.g. health aspects; ibid.), a certain desire to stay (Hofäcker and Naumann 2015) and many more.

Hinrichs (2000) argues that since the 1980s a general trend towards welfare retrenchment and especially reforming pension policy has taken place in OECD countries. This trend includes increasing the pension age, harmonizing special pension schemes (for example pensions for civil servants with the public pension) and expanding pension testing in first-pillar pensions, especially in social security countries (ibid.). These reforms have taken place in different ways and each country had and has its own way of reforming the social security system in its country to be sustainable in the longer term. This is also the case in Germany and Austria (Blank et al. 2016a).

In comparison between Germany and Austria, Hofäcker et al. (2019) argue that Austria has not made enough efforts to work against early retirement. They base their assumptions on still existing early retirement schemes as well as a high net replacement rate for regular old-age pensions. Hofäcker et al. (2019) focus on statutory retirement ages and early retirement schemes but ignore the massive reforms that have taken place around the turn of the century and further reforms regarding e.g. reformed invalidity pensions in the past few years.

Reforms targeting later retirement can be grouped in three branches: early retirement schemes, invalidity pensions, general elements of the pension system. Generally, the assessment base for a regular pension at 80% of previous income from gainful employment can be obtained after 45 years instead of 15 (Mayrhuber 2006). Austria has switched to defined-benefit pension accounts ‘with distinct and very transparent incentives for a later retirement’ (Türk 2019, 370).

In his paper, Türk (2019) names various measures concerning early retirement paths, such as the gradual increase of pensionable ages (increase of 18 months), the abolition of early retirement due to unemployment and due to long insurance periods. In case of heavy labor and very long insurance periods (45 years), citizens are eligible to retire at 60 years of age (ibid.). Early retirement still is possible when having reached the age of 62 with 40 years insurance record. However, deductions amount to 5.1% (instead of 4.2% before 2017; ibid.).

As for invalidity pensions, temporary invalidity was abolished (ibid.). Instead, funds for rehabilitation measures were introduced. The unemployment office is responsible for occupational retraining and introduced various active labor market programs together with the government (Türk (2019) provides more details in German).

Active labor market measures in Austria include incentives such as higher pension payments for more years in the labor market. Men between the ages of 65 and 68 and women between 60 and 63 years of age, respectively, will be rewarded with an increase in benefits of 4.2% or up to 5.1% penalties per year on pension benefits in the case of early retirement (Federal Ministry of Labour, Social Affairs, Health and Consumer Protection 2018; Federal Ministry of Finance 2018). Pension income is seen as income from gainful employment, thus pensioners are obliged to pay income tax (Federal Ministry of Finance 2020). Although, pensioners are able to get Incentives for employers such as defined periods of paying less non-wage labor costs for employing older workers have been implemented in recent years (BMASGK, 2019).

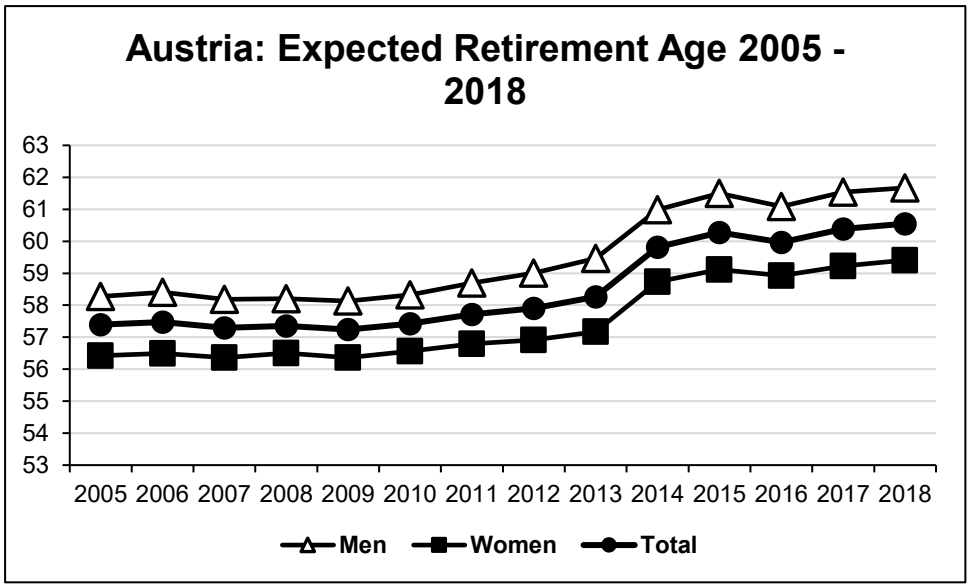

Figure 1 Retirement Age 2005 - 2018

Hofäcker et al. (2019) neglect to mention that the participation rate of those between 55 and 64 years old has doubled in the time span of 1994 to 2019 (29.4% to 56.4%) (OECD 2020). In fact, the average retirement age (for men and women) has risen from 57.39 years in 2005 to 60.55 years in 2018 with an upwards trend (Statistik Austria 2020, see Table 3). According to a long-term projection of the Austrian Institute of Economic Research (2019) the effective retirement age (for own pensions) will increase to 63 years for men and 62.1 years for women in 2060. In addition, they project 10% lower pension benefits for men and 7% lower benefits for women in the long term (as opposed to 2018). This is a result of the APG, which passed as a law in 2004 (ibid.).

Germany has undertaken different measures to ensure the sustainability of its pension system. The German red-green government at the turn of the century has reformed the pension system towards more responsibility for individuals and less for the state by drastically retrenching benefits in the first pension pillar. In the hope of cutting pension expenditures, the government closed pathways to early retirement, increased the statutory retirement age for both men and women and promoted taking out private pension insurances (second and third pillar pensions). In doing so, the government followed the suggestions of international organizations such as the European Union in restructuring the pension system into a multi rather than a single pillar system (Ebbinghaus and Neugschwender 2011).

The most important reforms in Germany targeted the general pension system, reduced earning capacity pensions (which are the equivalent to invalidity pensions in Austria) and early retirement paths.

In the face of low net replacement rates (average pension income from public pension was around 67% of lifetime earnings in 2005, and it is decreasing; Bäcker et al. 2008), the German government explicitly encourages workers to work beyond the statutory pension age by granting additional benefits of 0.6% per month between the ages of 65 to 67. In postponing benefit receipt beyond the statutory retirement age, older workers receive additional benefits of 0.5% per month as soon as they receive their pension payments (Schmitz 2018). The pensionable age is gradually increased to 67 years until 2029 (Bäcker 2018b). Regular old age pensions can only be obtained without deductions at the age of 65 (this age is gradually increased in monthly steps starting in 2012), except for the pension for the profoundly disabled (Bäcker et al. 2008). In this case, the earliest possible age a pension can be received is 63. With these measures, Germany has reformed retirement schemes so that there are no financial incentives for retiring early.

In the case of longer employment while drawing a pension, the income from gainful employment will not be counted (ibid.). Employee contributions for pension insurance and unemployment insurance do not have to be paid, while there is an option to pay those contributions in order to increase the later pension benefits (ibid.). According to Bäcker (2018b), employer and employee can agree on an extension of an employment contract beyond the statutory pension age.

Reduced earning capacity pensions have been reformed insofar, as categories have been established: partial reduced earning capacity pensions have been established for those who can work three to under six hours a day (Bäcker 2018b). Full reduced earning capacity pensions are designated to those who can work zero to under three hours a day (ibid.). Assessment criteria have been tightened (ibid.). Reduced earning capacity pensions are generally temporary and require reapplication every three years (ibid.). In case of early retirement (before the age of 65), regular pensions are deducted a maximum of 10.8% (ibid.).

Germany managed to reduce public pension spending in the long term in order to counteract demographic ageing. Both Germany and Austria have managed to increase labor market participation for older adults (citizens aged 50 to 64) and especially for women. Table 4 shows the labor market participation rates of women and men aged 50 to 64 for Austria and Germany (Eurostat

2020a). In both countries, a significant increase can be observed, showing that both reform histories have had positive effects on longer participation in the labor market (see figure 2).

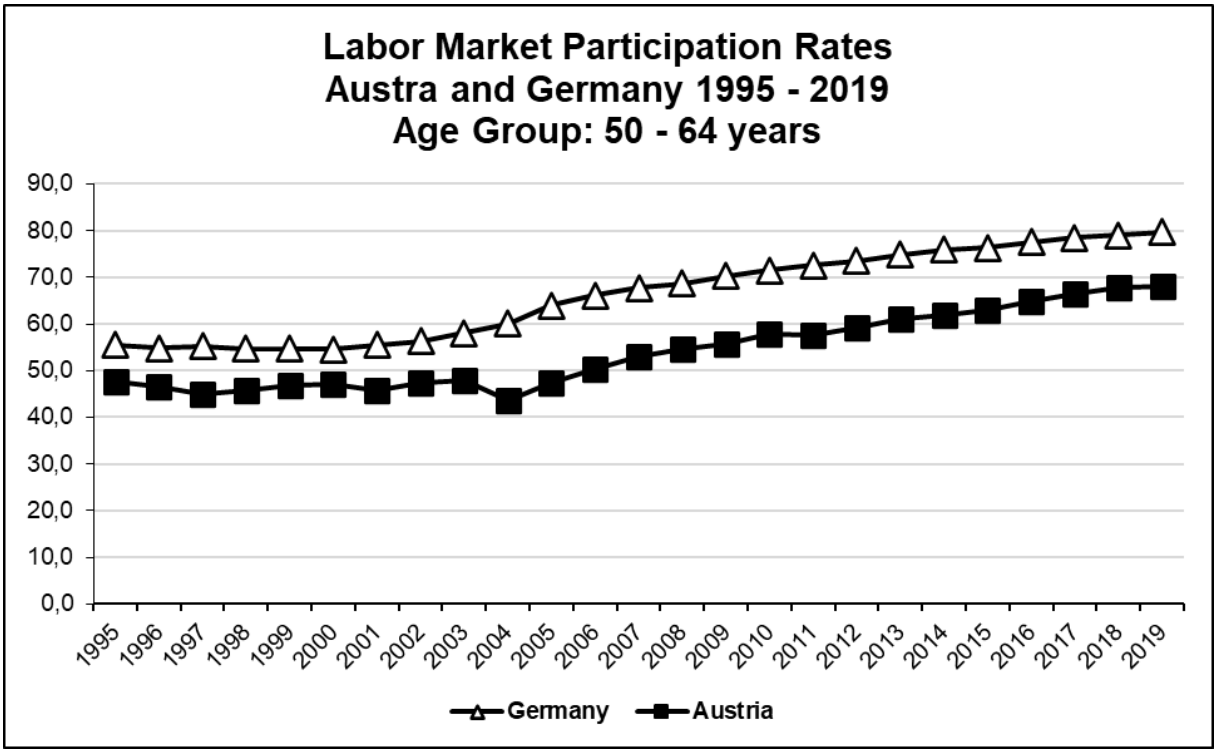

Figure 2 Employment rates by sex, age and citizenship

Blank et al. (2016a) argue that crucial reforms in Germany in the early 2000s (specifically the 2001 and 2004 reforms) have weakened the first pillar pensions and individual, private pensions (Eigenvorsorge) could not compensate the drastic retrenchment of pension benefits. This view is also supported by the OECD (2019). The annual 'Pensions at a Glance' report for 2019 emphasizes a great risk of poverty for low earners because of the low net replacement of 56% of previous earnings. For average earners, the net replacement rate is 52% (ibid.). These rather high net replacement rates for low income earners depict an ideal rather than the reality. Employment biographies are more prone now than in the past to be disrupted by periods of unemployment or non-gainful employment. The OECD (2019) project an increase in pension expenditures despite a 10% drop in pension levels for German citizens. Not only low earners, but also many other groups will be exposed to the risk of old-age poverty in the near future. Amongst them are workers in atypical forms of employment, single parents and self-employed (ibid.). The gender pension gap is the highest among all OECD countries with 46% (ibid.).

As a top performer, Germany has managed to increase its labor market participation rates of older adults drastically. In fact, there is a profound increase in the participation rates beyond statutory pension age in Germany as well. Figure 3 shows that this trend has increased rapidly since the 2004 reforms have become law (Eurostat 2020a). There is a remarkable increase from 2.5% in 1995 to 7.4% in 2018.

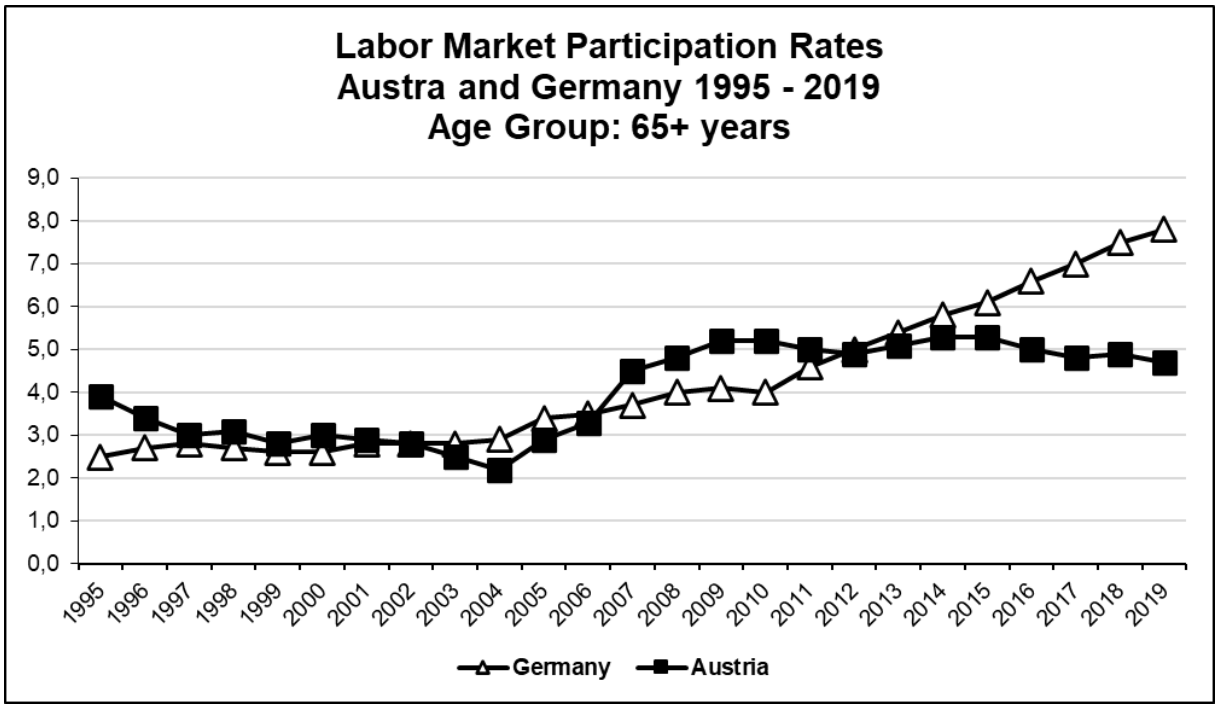

Figure 3 Employment rates by sex, age and citizenship

Summarizing, Germany and Austria both have made efforts to keep pension expenditures sustainable for the future. Both countries needed to reform their pension systems to sustain demographic ageing and both have. What did the two countries do differently? The most important aspect of the countries' reform histories is a paradigmatic one. Austria has reformed its pension system from within and held on to the public pension pillar as a guarantee to a decent standard of living (Blank et al. 2016c). Occupational and private pensions still only play a secondary role in Austria, but benefit retrenchment has occurred in the state pension insurance. Pathways to early retirement have been reformed, but generally not been cancelled.

Germany has chosen a different path, departing from the traditional Bismarckian single-pillar pay-as-you-go scheme. Instead, a multi-pillar scheme has evolved, weakening the public pillar and putting more attention to private pension schemes. The German statutory pension scheme now primarily functions as social safety net, promoting private provision for old age. Both Germany and

Austria have managed to counteract demographic ageing and ensure sustainability of their public pensions. The reform paths that were chosen now show different results with the risk of poverty rate of pensioners in 2018 being 17.5% in Austria versus 18.7% in Germany (Eurostat 2020b, see figure 4).

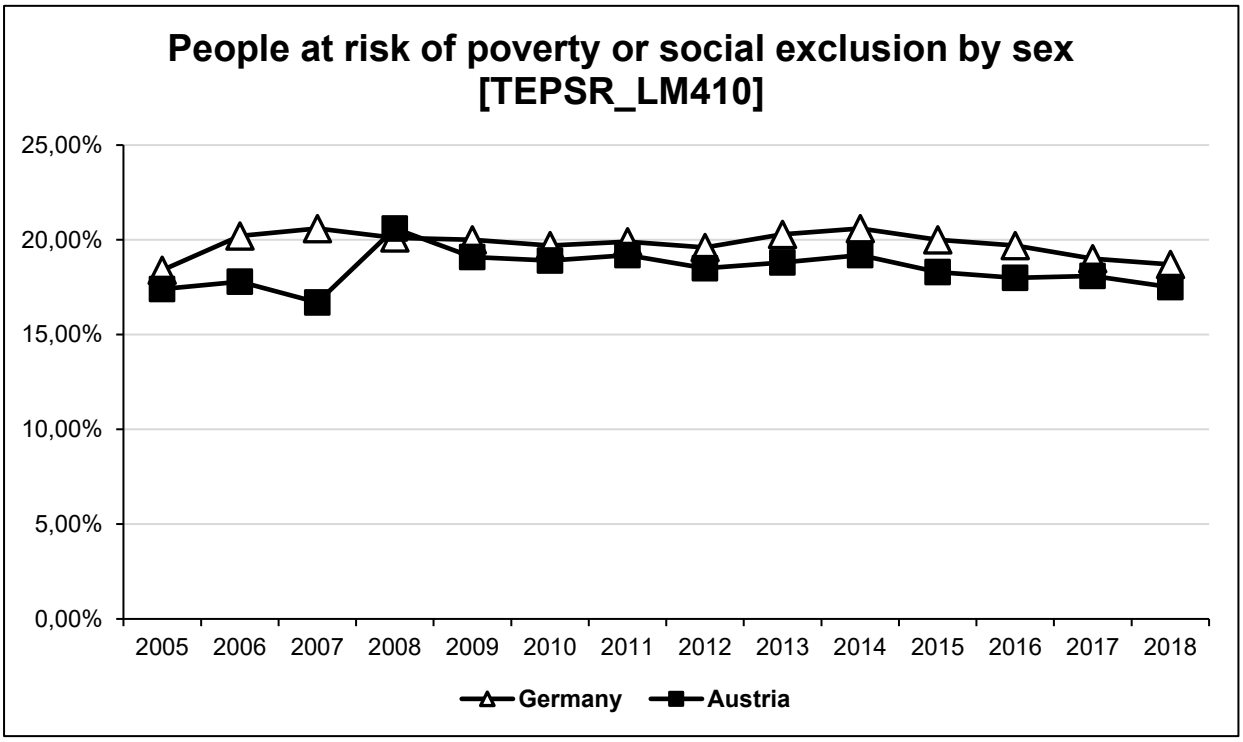

Figure 4 People at risk of poverty or social exclusion by sex

6. METHODOLOGY

1. Data and Sample

For the empirical research, data from the seventh wave of the Survey of Health, Ageing, and Retirement in Europe (SHARE) was used. The SHARE longitudinal, cross-national and multidisciplinary survey aims at providing nationally representative micro-level panel data of economic, social and health factors, which influence and accompany ageing processes at individual and societal levels (cf. Börsch-Supan et al. 2013). SHARE collects data from 140.000 citizens in European countries aged 50 years and older. SHARE's wave 7 had its fieldwork done in 2017, was released in 2019 and included eight new countries (Bulgaria, Cyprus, Finland, Latvia, Malta, Romania and Slovakia) in addition to Hungary, Austria, Germany, Sweden, the Netherlands, Spain, Italy, France, Denmark, Greece, Switzerland, Belgium, Czech Republic, Poland, Luxembourg, Portugal, Slovenia, Estonia, Croatia, Lithuania, and Israel. According to Wahrendorf et al. (2017) SHARE provides data with above average household response rates in comparison to other European surveys. Wave 7 is the newest survey wave and thus provides latest findings on important topics.

The SHARE datasets cover various modules, such as 'employment and pensions', 'household income', which enable to investigate the hypothesis mentioned above. For instance, the module on employment and pensions asks about current work activities, income sources (pension income, from gainful employment or others). Additionally, data on reasons for retiring and pension benefit receipt from different sources is collected. The questionnaire includes an assessment of the psychosocial environment of the last main job, allowing to search for influences of working conditions on retirement decisions.

Wave 7 includes a SHARELIFE module, which covers retrospective questions on employment, work quality, health, finances and more. The SHARELIFE retrospective questionnaire allows a life course perspective for exploring what role work history plays in early or late retirement, as suggested by Dingemans and Möhring (2019). In order to reconstruct the life history, a Life History Calendar (LHC) approach is used in all Computer Assisted Personal Interviews (CAPI) (Schröder 2011). The survey also provides insight into individual's working conditions by implementing the demand-control model by Karasek and Theorell (1990) and the effort-reward imbalance model by Siegrist et al. (2004) into the survey. In addition, physical and mental health are explored as well as expectations for the

future (e.g. regarding the expected age of retirement). For a full list of modules go to share-project.org.

The newly released dataset has not yet been studied by many scholars. This thesis will therefore be based on very up-to-date data and present an innovation in empirical retirement decision research. This section provides insight into which variables are used in order to measure why respondents have worked beyond the statutory retirement age.

The samples are separated by country. There are samples for Germany and Austria each, then one for all SHARE countries. The sample includes all cases who responded to the questions, if respondents received income from gainful employment (dependent or independent) in the last year. First, I describe the sample for Germany and Austria, afterwards the SHARE sample will be discussed shortly.

For Austria, the age threshold for women is 60 and for men 65. For Germany, the age threshold for both women and men is 65. The sample for both countries comprises 4787 individuals (N=4787) in total, with a gender distribution of 43% men and 57% women and without missing data. The mean age among men is 74.1 years, among women 73.16. In the sample, 53.2% of respondents are Austrian and 46.8% are German. In Austria, we find that 36.7% are male and 63.3% are female. In Germany, a rather even gender distribution with 50.2% men and 49.8% women can be found.

The total number of valid cases who responded to the question if they received income from gainful employment last year is 1137, which, unfortunately, is only 23.8% of all cases in the sample. Within this sample, 10.2% of respondents claim that they have received income from dependent or independent work or both in the last year. In total, 4 cases stated that they received income from dependent and independent employment in the last year.

In the Austrian sample, the variable asking if one received income in the last year comprises 461 cases, of which 36% are male and 64% are female. Within this variable, only 6.3% of all respondents state that they received income from gainful employment in the last year. The gender distribution of those, who received income either from dependent or independent employment or both, is rather equal (44.8% men, 55.2% women). In the German sample, the variable asking if one received income in the last year comprises 676 cases, of which 49.4% are male and 50.6% are female. Within both genders, 12.9% of participants have responded that they received income from gainful

employment in the last year. Again, the cases are distributed rather equally across the two gender categories (52.9% men versus 47.1% women). Interestingly, the case distribution shows that a lot less individuals answered the question connected to this variable in Austria than in Germany. Figure 5 gives an overview of the male and female respondents for each country and the SHARE population sample according to the variable in investigation.

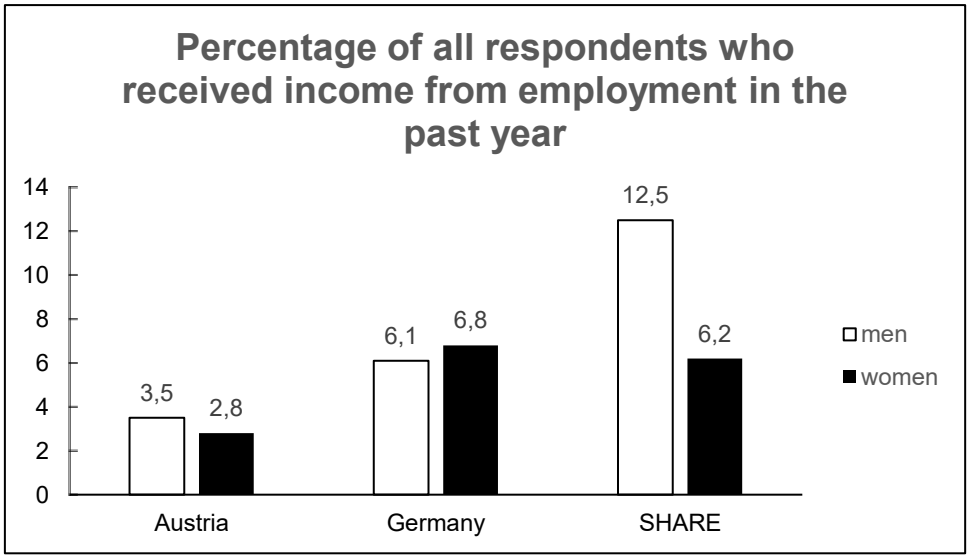

Figure 5 Percentage of people with income from gainful employment in the last year

In the SHARE population the age threshold for both women and men is 65. 24.1% of all respondents have answered if they received income from gainful employment in the last year. Thus, the SHARE sample consists of 11083 cases in total. Of the valid data, 9% have claimed to have received income from employment in the last year. The sample comprises 44.4% men and 55.6% women. 12.5% in the male group and 6.2% in the female group responded, that they were employed in the last year.

2. Measures

A filter on the entire datasets is applied, excluding all respondents in Germany below 65 years as well as men below 65 years and women below 60 years in Austria. The SHARE sample consists of respondents above the 65-year threshold. This step excludes all respondents below the statutory retirement age and leaves the sample with everyone above this age threshold in their respectable country.

The dependent variable in this thesis is 'working after the statutory retirement age'. To determine if someone is in fact employed or has been in the last year, a measure on income from gainful employment in the last year is applied. Searching for income in the last year is the most precise way

to measure factual employment status in the SHARE survey, since the other option, namely the question 'In general, which of the following best describes your current employment situation?', is a subjective ascription. The measure used in this paper combines cases with income from dependent employment and independent employment. Both original variables were recoded so that 'Don't Know' and 'Refuse' were coded as missing, 'No' was coded as 0 and 'Yes' was coded as 1.

Preceding the application of the independent variables of gender, age and education, categorial variables with more than two response options are recoded into dummy-variables. Applying this, I, for instance, follow Hofäcker et al. (2016) who suggest to recode the education variable as asked in the SHARE survey into three groups for easier interpretation in the regression models: lower secondary education or less (International Standard Classification of Education (ISCED) 0-2), upper secondary education (ISCED 3-4) and tertiary education (ISCED 5 and higher).

Crucial information on reasons why respondents work beyond the statutory retirement age includes if their total monthly household income is enough to make ends meet (CO007_AbleMakeEndsMeet). Furthermore, a differentiation is made between public pension benefits and income from occupational and private (pension or life) insurances.

Following Wiß et al. (2019) a sector of employment variable will be included in the analysis. They found that 'the sector of employment is significantly related to age at retirement' (Wiß et al. 2019, 18). Economic sectors will be regrouped as follows: manufacturing, industry, trade, finance and insurance, service and primary. This will enable an easier interpretation of the results.

3. Method

For the analysis, multiple logistic regression models for both Germany and Austria are computed separately. Multiple regression models are commonly used in data analysis and allow to describe the relationship between the dependent and one or more independent variables (Hosmer and Lemeshow 1989). One can identify the logistic regression model by its binary or dichotomous outcome variable in comparison to the linear regression model (ibid.), where the value of the dependent variable varies proportionately to the variation of the independent variable(s) (Fromm 2012). Fromm (2012) argues that logistic regression analysis is used to differentiate between groups by identifying variables, which produce these differences as well as predicting their effects. The logistic regression model is an example of a generalized linear model, in which estimators of the dependent variable cannot be determined through a linear equation, but through the use of a link-function between linear function and estimators (ibid.). By using a link-function, the regression line is transformed into a non-linear trajectory (ibid.). Transferred to the topic of this master thesis, the dependent variable 'income from gainful employment' is indeed dichotomous (0=no, 1=yes).

Using SPSS Statistics version 25, I created this binomial logistic regression model with the dependent variable being income from gainful employment. As independent variables I included gender, age, the level of education and the receipt of pension payments. The constant is as follows: female respondents, aged 60/65 (depending on the sample filters) with a low level of education and no receipt of a public pension payment (for Austria). For Germany, the receipt of occupational and private pension payments as well as payments from a life insurance have been included, with 0=no receipt. The SHARE sample additionally includes control variables for Germany and Austria (in comparison to all participating SHARE countries) and the aforementioned variable for if the household is able to make ends meet, with 'easily' being part of the constant.

Having applied the regression models, it is visible in Table 3 that Austrian sample fitted well. With a sample of 457 cases, the Omnibus tests of model coefficients are significant (α=0,001). The difference between the -2 Log-Likelihood of the null model and the predictors model is 35.642. At 5 degrees of freedom, this lies above the critical value of the χ2-distribution. This explains that the regression model itself with the included variables is significant so far, that it explains influences on the dependent variable better, than the model without the independent variables and just the

constant. The Nagelkerkes-R^2 test shows that the model accuracy of the predictors model (Model 1) is 20.3% higher than the null model with just the constant (Model 0).

For Germany, a total of 668 cases are included in the binary logistic regression analysis. The Omnibus tests of model coefficients are significant on a α=0,001 level. The difference between the -2 Log-Likelihood of the null model and the predictors model is 39,884 and lies above the critical value of the χ2-distribution at 8 degrees of freedom. Thus, the null hypothesis can be rejected, the goodness of fit of the predictors model is significantly better than of the null model. The model summary (table 6) shows that the predictors model explains 10.8% more of the dependent variable than the null model (Nagelkerkes-R^2=0.108).

6792 respondents are included in the regression model for the SHARE population. Again, the Omnibus test of model coefficients shows a statistical significance, which allows the analysis of the coefficients. The goodness of fit of the predictors model, which includes all independent variables, is significantly better than of the null model. The Nagelkerkes-R^2 test shows that model 1 explains 20.6% more of the dependent variable than model 0.

7. RESULTS

1. Descriptive results

In Austria, 31.5% of those who responded to allincome (the receipt of income from gainful employment in the last year), show a low level of education (ISCED 1997 education levels 1 to 2). Furthermore, 21.2% have completed medium education (ISCED 1997 education levels 3 to 4). Another 47.3% have completed higher education (levels 5 to 6). In Germany, 10.4% of those who responded to allincome, show a low level of education (ISCED 1997 education levels 1 to 2). 34.5% in this group have completed medium education and 55.1% have completed higher education.

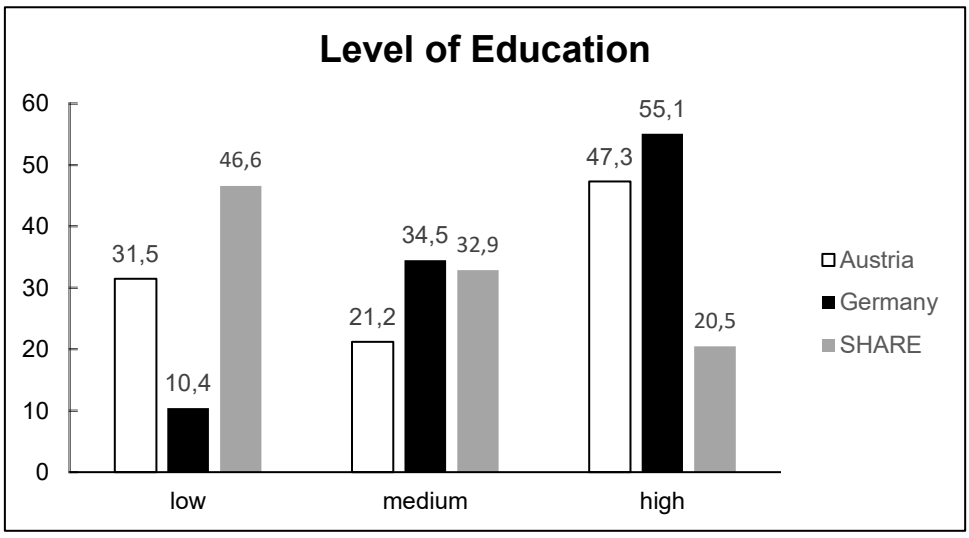

Figure 6 Educational Attainment

In the SHARE sample, 46.6% of all respondents have completed a low level of education (ISCED 1997 education levels 1 to 2), 32.9% of respondents have completed medium levels of education (levels 3 to 4) and 20.5% have completed high education (levels 5+). Of those, who claimed to have had income from employment in the last year, 39.1% have completed medium levels of education. 36% have completed higher levels of education and the rest (24.9%) have a low level of education.

In Austria, the mean age of all respondents included in the analysis is 74.8 years old, with the median at 74 years. The mean age for male respondents is 74.3 years and for female respondents 75 years. The mean age of the German population included in the analysis is 73.9 years, with the median at 73 years. The mean age for male respondents is 74.2 years and for female respondents 73.7 years.

In the SHARE sample, the mean age of all respondents in the sample is 75 years. The mean age of all men in the sample is 74 years and women 75.2 years. In the male group, the mean age of those who claim to have received income in the last year is 70 years. Similarly, in the female group the mean age is 69.9 years.

Further, 90.7% of Austrian and German participants in the survey received payments from a public pension in the last year. In terms of gender distribution, it becomes clear that there are far more men who received public pension payments in the year prior to the interview than women. Whereas almost all the male respondents received public pension payments (98%), this looks very different in the female group of respondents. Here, only 85% received public pensions.

The second pension pillar, occupational pensions, shows another picture. Here, only 18.1% all respondents, whether male or female, received pension payments in the last year. Among men, only 24% could draw from an occupational pension. Again, the percentage of women, who received payments from occupational pensions in the last year is lower. 13.4% of women benefited from occupational pensions in the last year.

The private sector of old age income is almost not present. Independent of gender, only 2.4% of respondents claim to have received income from a private pension insurance in the last year. This is 3.2% of all men and 1.7% of all women, who answered to the income from gainful employment question (allincome). Lastly, only 2.2% of respondents received payments from a private life insurance in the last year. Only 2% of men and 2.4% of women state, that they received income from this source.

Before looking at Austria and Germany separately, I want to acknowledge that there is a clear pattern of importance here. Citizens in both countries heavily rely on the public pension system. Whereas the second pillar is somewhat important, and the amount of income citizens typically draw from this have not been discussed yet, the private pillar appears to hold the least importance in old age income.

In Austria, 82.4% of all those, who responded to the allincome question, received public pension payments in the last year. Analogous to the complete sample, there is a big gender divide. Whereas 96.4% of men receive pension payments, only 74.6% of women do. Further, the amount of statutory pension payments varies also across gender. On average, men received 1520€ in monthly public

pension benefits in the last year, whereas women only received 1283€. Looking at the median for women's income, it is noticeable that this is a lot lower at 855€, whereas it is even higher for men with 1555€. Additionally, by looking at the 80%-mark, women's income is at 1400€ and men's income is at 2000€. This information needs to be reflected on carefully, since this probably does not represent Austria in reality. The sample size for this variable is at 380 respondents (220 women, 160 men). A calculation with register data would be much more precise. Nevertheless, this clearly shows a gender income gap (see figure 7).

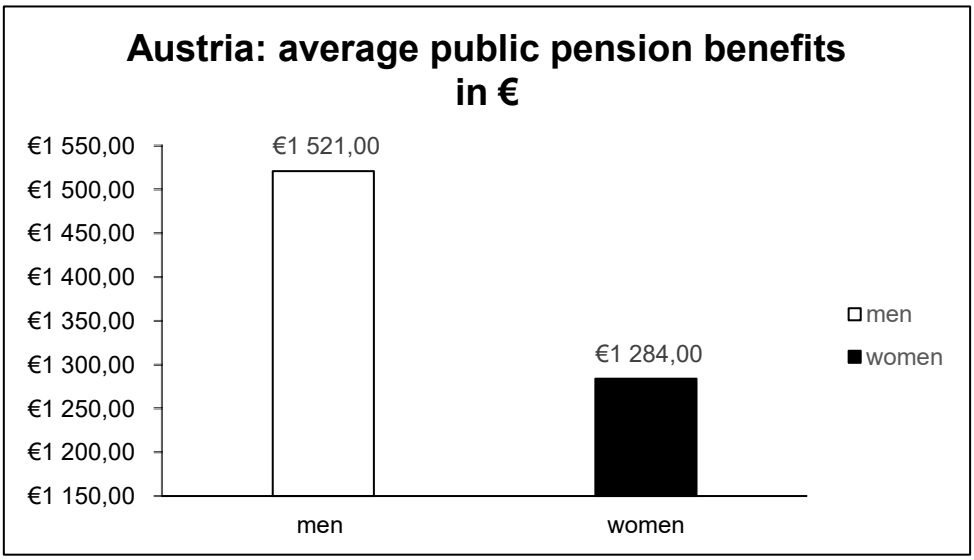

Figure 6 Austria: Average Public Pension Income in EUR

Similar to the overall data, the second pillar is not of much importance for the Austrian population. In total, only 3.7% of respondents received pension payments from their company's pension schemes in the last year. Again, a big difference between men and women can be observed. 6.7% of all men and only 2% of all women received occupational pension benefits.

The third pillar seems to be the least important in Austria. 2% of all respondents receive either private pensions or private life insurances or both in Austria. That is 2.4% of all men and 1.7% of all women receiving private benefits.

This shows the importance of the Austrian public old age security system. With only the public pension scheme in Austria being compulsory, occupational and private pension benefits are rather rare and inconsistent in their amount.

In Germany, 96.4% of all respondents receive public old age pension benefits. 98.8% of men and 94.1% of women state that they received payments in the last year. The amount of statutory pension

payments varies strongly across gender. Men receive almost 50% more money from public pension benefits than women (1992.3€ versus 1086€ on average). Looking at the median for women's and men's income, the differences in income seem high as well. The median income for women is at 773€ and for men at 1300€. Even worse, 80% of all women who answered this question on the amount of monthly public pension income do not receive more than 1200€ a month, while men receive 2100€ a month. This information needs to be reflected on carefully, since this probably does not represent the real German situation. The sample size for this variable is very small with only 649 respondents (319 women and 330 men). Although a calculation based on register data would be much more precise, the data used here still shows a large gender pay gap throughout one's working career, that can also be found in register data.

Contrary to Austria, where only 3.7% receive payments from occupational pensions, we find that 27.9% of all respondents receive payments in Germany. Again, almost 10% more men than women received benefits in the last year (32.6% of men versus 23.2% of women). The pattern of gender income inequality can also be observed in this pillar. On average, women earn about 70% less money from occupational pensions than men (531€ versus 1866€ monthly). This is also clearly shown with the 80%-mark: 80% of women receive 500€ or less from occupational pensions while 56% of men receive the same or less. Instead, 80% of men receive 1600€ or less from occupational pensions (see figure 8). Again, this needs to be reflected on with caution, since the sample size is very small (188 respondents in total).

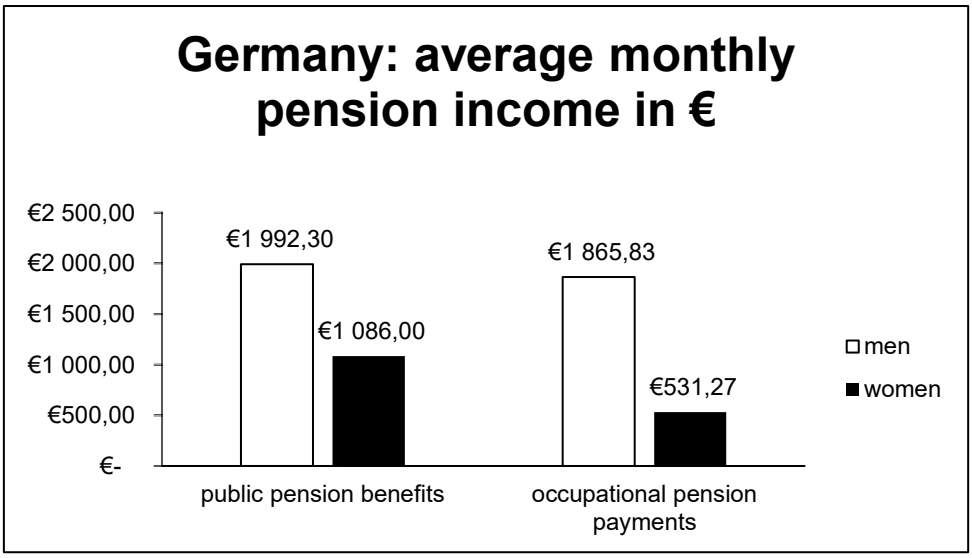

Figure 7 Germany: Average Income from Public and Occupational Pensions

Further 6.4% of all participants have received benefits from either private pensions or private life insurances or both in the last year. Here, the cases are distributed rather equally across gender with 6.6% of men and 6.1% of women having received additional income from this source.

The descriptive data for Germany confirms a clear institutional difference to Austria. As described in Chapter 5, Germany has reformed its pension system towards a multi-pillar system, promoting private and occupational ways of saving money for retirement age. Whereas the second and third pension pillars cover the least amount of old age income in Austria, we see that a third of the analyzed German population has received pension benefits from those non-public pillars.

In the SHARE sample, 79.1% of all respondents receive payments from public pensions. 86.9% of all male respondents receive public pension benefits, whereas only 73% of all women do. Furthermore, only 14.1% of all respondents received occupational pension benefits in the last year. This is distributed rather equally across gender: 16% of men and 12.7% of women claim to have received second pillar benefits. The third pension pillar does not seem to be of great importance in the whole SHARE sample either. Only 4% of all respondents claim to have received private pension benefits in the last year and 1.3% received payments from a life insurance.

There are 820 valid cases in total for the variable *consumption*, which asks if households are able to make ends meet. The question has been answered by 348 respondents in Austria and 472 respondents in Germany, with only 11.8% (96 cases) of all of these respondents claiming to have 'some' or 'great' difficulty in getting by. 485 respondents state that they can make ends meet easily

(59.1%) and almost 30% state that this is ‘fairly’ easy for them (238 cases). This is represented similarly in the separate countries. Both in Austria and Germany we find 29% respondents claiming they can make ends meet ‘fairly easily’. The percentage of respondents claiming this is ‘easy’ is 59.5% in Austria and 58.9% in Germany (see figure 9). Due to the very small number of cases in two of the categories (‘with great difficulty’ and ‘with some difficulty’), this variable cannot be included in the regression analysis.

Taking a look at the SHARE sample it is visible that 12.7% of all respondents in the SHARE sample claim to be able to make ends meet with great difficulty (see figure 9). Whereas 23.4% of respondents have ‘some difficulty’ making ends meet, the majority in this sample makes ends meet ‘fairly easily’ (26.5%) or ‘easily’ (37.4%). Due to the case numbers in the larger sample, the variable will also be applied in the regression analysis.

Unfortunately, the last independent variable, sector of employment has only a few valid cases. Austria shows only 6 and Germany 14 valid cases for investigation. Most cases (5 in Austria, 11 in Germany) are in the service sector, one case is in the manufacturing sector (Austria) and one case each in industry, trade and finance (Germany). Due to the very small case number, the variable

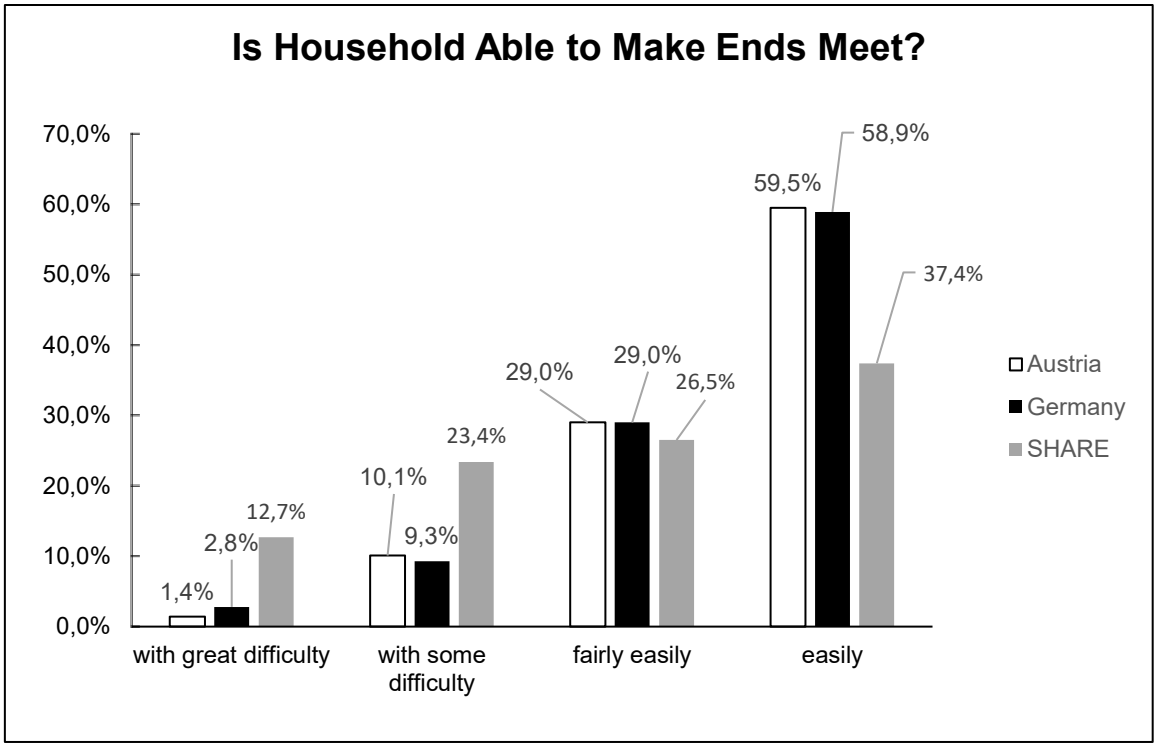

Figure 8 Is Household Able to Make Ends Meet

cannot be used in any further multivariate analysis. Interestingly, even in the SHARE sample with a much large sample, the number of cases for the *sector of employment* variable seems to be very low. Only 177 respondents have answered, in which sector of employment they work. Analogous to the sample with only Austria and Germany, the majority of cases can be found in the service sector (108 cases).

	Germany	Austria	SHARE
Gender male	334	166	4921
Gender female	342	295	6162
Mean age men	74,2	74,3	74
Mean age women	73,7	75	75,2
low level of education	70	144	4881
medium level of education	371	216	2148
high level of education	232	97	3439

Table 3 Case numbers (n) of independent variables

Table 10 shows all n of independent variables which have been applied to all regression analyses. Thus, the variable for the question if households are able to make ends meet and for the sector of employment are not included in the table.

2. Logistic regression analysis

After the descriptive analysis of all variables, the binary logistic regression analysis will be discussed in the following. Three separate regression models were run, one for each country. Since there are major differences in case numbers across the two countries, the Austrian regression model does not include variables for the second and third pension pillar, which are occupational pension, life insurance and private personal pension. Furthermore, data on consumption (being able to make ends meet) and sector of employment are insufficient, which is why none of these variables are included in the regression models. First, Austria will be analyzed, followed by Germany. At last, I analyze the whole SHARE sample, to see if the missing variables and small number of cases might affect the outcome in the two analyzed countries.

Coefficients in the regression model

	B	S.E.	Sig.	Exp(B)	95% C.I.for EXP(B)	
					Lower	Upper
Gender	0,361	0,435	0,406	1,435	0,611	3,370
Age	-0,175	0,041	0,000***	0,839	0,774	0,910
Level of Education						
Medium	0,080	0,568	0,889	1,083	0,356	3,297
High	0,904	0,594	0,128	2,470	0,771	7,913
Receipt of pensions and life insurance						
Public pension	1,632	1,060	0,124	5,112	0,641	40,789
Constant	7,780	2,938	0,008	2391,910		

a. Variable(s) entered on step 1: education grouped, gender (1=male), Age of respondent at the time of interview, public_pension.

Table 4 Coefficients in the regression model Austria

Notes: *Sign. < 0.1, **Sign. < 0,01, ***Sign. < 0,001

Furthermore, table 15 shows that only the age of the respondents, significantly influences if respondents received income from gainful employment in the last year. A negative correlation between income and age can be observed. The odds that respondents received income from gainful employment in the last year decrease with increasing age by a factor of 0.839.

The statistical insignificance of other variables in the logistic regression model might be caused by the small sample number in Austria (N=457). The correlation between male gender and income from gainful employment in the last year for those above the age of 65 and 60, respectively is quite interesting. The odds for men to being employed in old age is 43.5% higher than for women. However, this needs to be examined with caution, since the gender variable is not significant.

Moreover, the receipt of a public old age pension has a positive, yet insignificant, effect on the receipt of income from gainful employment. Reflecting on the direction of correlation, the receipt of public old age pension and working after having reached the statutory retirement age can go hand in hand and must not exclude each other. Working while receiving pension benefits might be financially viable, since the benefit from postponing public pension receipt is only limited. As discussed in section 2 of this thesis, being employed while receiving pension benefits seems to be

rather voluntary than out of financial necessity. In line with the positive effect of a medium or high level of education, although not statistically significant, this result points towards those, who are willing to stay in the labor market, because they enjoy their job or have a lot of time on their hands.

Lastly, according to the table, a high level of education is positively associated with having income from employment in old age, although the association is statistically insignificant. In line with my argumentation in section 2, this would not be surprising. With Austria having generous net replacement rates of lifetime earnings and the goal of status maintenance, even groups associated with low income do not lose a lot of monthly income after retirement. In addition, there are still pathways for early retirement in place, especially designed for those whose jobs include heavy, manual labor.

Coefficients in the Regression model

	B	S.E.	Sig.	Exp(B)	95% C.I.for EXP(B)	
					Lower	Upper
Gender	0,351	0,248	0,156	1,421	0,874	2,309
Age	-0,116	0,024	0,000***	0,890	0,850	0,933
Level of Education			0,991			
Medium	0,040	0,452	0,929	1,041	0,430	2,523
High	0,009	0,470	0,984	1,009	0,402	2,536
Receipt of pensions and life insurance						
Public pension	-0,901	0,496	0,069*	0,406	0,154	1,073
Occupational pensions	-0,294	0,279	0,292	0,745	0,431	1,288
Private pensions	-0,510	0,547	0,352	0,601	0,206	1,756
Life insurance	0,104	0,675	0,877	1,110	0,295	4,171
Constant	7,582	1,863	0,000	1962,186		

a. Variable(s) entered on step 1: education grouped, gender (1=male), public_pension, occup_pensions, Age of respondent at the time of interview, private_pensions, life_insurance.

Table 5 Coefficients in the regression model Germany

Notes: *Sign. < 0.1, **Sign. < 0,01, ***Sign. < 0,001

In the regression output 'Variables in the Equation' (see table 11), the Wald test shows that not only the age of respondents, but also the receipt of public old age pension benefits has a significant effect on income from gainful employment in the last year. Similar to Austria, increase in the age of respondents has a negative effect on working in retirement. The odds that respondents received income from work in the last year decrease with increasing age by a factor of 0.890.

The receipt of statutory pension benefits is also significantly negatively associated with employment in retirement age. According to table 11, the odds of employment in the last year decrease by a factor of 0.406 with the receipt of public pension benefits.

Unfortunately, neither the variables of education, nor the variables of the second and third pension pillar show significant effects according to the Wald test for single coefficients. Therefore, conclusions can only be made with caution by looking at the directions coefficients are pointing towards.

In chapter 2, I hypothesized that, in Germany, workers with low and high, rather than medium, levels of education work beyond retirement age. Estimating based on the insignificant coefficients in the regression output for Germany, this hypothesis can be rejected. According to the regression analysis, both medium and high levels of education have a positive, yet insignificant, effect on income from gainful employment in old age. This is interesting, since, logically, those with low levels of education should be more prone to the risk of poverty in old age and therefore find the need to work. This argumentation would also be in line with the negative significant association of the receipt of public pension benefits and having income from employment.

Furthermore, the receipt of occupational and private personal pensions as well as life insurances is not significant in table 12. From the descriptive analysis, one can speculate that the very low case numbers can be a cause for this. As pointed out in section 9a, only 6.4% of all respondents claimed to have received payments from any third pillar insurance in the prior year, which are 43 individuals in total.

Similarly to Austria, a positive effect of the gender variable can be estimated. It is observable that male gender positively correlated with receiving income from gainful employment in the last year.

Coefficients in the regression model

	B	S.E.	Sig.	Exp(B)	95% C.I.for EXP(B)	
					Lower	Upper
Austria	-0,633	0,265	0,016**	0,531	0,316	0,892
Germany	-0,096	0,160	0,550	0,909	0,664	1,244
Gender	0,630	0,088	0,000***	1,878	1,580	2,232
Age	-0,147	0,009	0,000***	0,864	0,848	0,879
Level of Education						
Medium	0,548	0,113	0,000***	1,730	1,385	2,160
High	0,764	0,119	0,000***	2,148	1,700	2,713
Household able to make ends meet						
with great difficulty	-0,811	0,182	0,000***	0,444	0,311	0,635
with some difficulty	-0,587	0,129	0,000***	0,556	0,431	0,716
fairly easily	-0,411	0,110	0,000***	0,663	0,534	0,823
Receipt of Pensions and life insurance						
public pension	-0,631	0,110	0,000***	0,532	0,428	0,660
occupational pensions	0,457	0,109	0,000***	1,579	1,275	1,956
private pensions	0,213	0,164	0,195	1,237	0,896	1,708
receipt of life insurance	0,592	0,263	0,02**	1,807	1,079	3,028
Constant	8,338	0,657	0,000	4178,368		

a. Variable(s) entered on step 1: austria, germany, Age of respondent at the time of interview, education grouped, gender (1=male), household able to make ends meet with great difficulty, household able to make ends meet with some difficulty, household able to make ends meet fairly easily, public_pension, occup_pensions, private_pensions, life_insurance.

Table 6 Coefficients in the regression model SHARE

Notes: *Sign. < 0.1, **Sign. < 0,01, ***Sign. < 0,001

In this regression model, the analyzed countries, Austria and Germany, are included in the logistic regression model as control variables (see table 12). Interestingly, whereas the variable for Austria is significant in the model, the one for Germany is not. However, coefficients for both variables are negative. For Austria, the odds of having received income from gainful employment by those who are 65 years and older are 46.9% lower than for the average SHARE population of all countries. Although the variable for Germany is not significant, estimates can be made. With caution one can

record that the odds of Germans having received income from employment in the last year decreases by 9.1% as opposed to the SHARE sample.

As in Germany and Austria, the increasing age of respondents is negatively associated with income from employment. With increasing age, the odds of receiving income from employment decrease by 13.6%.

Analogous to Austria and Germany, the level of education, as another significant variable, shows a positive effect on income. The higher the level of education, the more likely it is that respondents have received income from employment in the last year. Whereas the effect for a medium level of education increases by a factor of 1.730, the effect for a high level of education is much stronger. With a high level of education, the odds of having received income increase by a factor of 2.148.

Being male is also positively associated with being employed in retirement age. The regression analysis shows a significant positive effect, increasing the odds of having received income by a factor of 1.878, or 87.8%.

The consumption variable, household able to make ends meet, which could not be included in the separate regression models for Austria and Germany, due to the small sample sizes in specific groups of the variable, shows a significant influence in the SHARE sample. Income and being able to make ends meet have a negative correlation, showing that those who have received income in the last year can make ends meet significantly easier.

After discussing the control and consumption variables, level of education, gender, age and being able to make ends meet, the pension benefit variables will be discussed.

According to table 12, the receipt of public pension benefits negatively affects income from gainful employment in the last year. Thus, the odds of being employed in retirement age decrease by 46.8% in the case of receiving public pension benefits. Interestingly, the receipt of occupational pension benefits is positively associated with being employed. The odds of having received income from employment increase by a factor of 1.579 in the case of receiving payments from an occupational pension scheme. Similarly, the receipt of a life insurance has an even stronger effect on employment. The odds of having received income from employment in the last year increase by 80.7% when receiving payments from a life insurance.

Apart from the variable for Germany, the only other statistically insignificant variable shown in the logistic regression model is the receipt of payments from a private pension scheme. This is surprising, since the variable for the receipt of payments from a life insurance shows fewer cases although statistically significant. Whereas both life insurance and private personal pension fall under the third pension pillar, especially public pension benefits seem to crowd out the necessity of taking out a private insurance.

8. DISCUSSION

Generally, a small sample size is a major difficulty when performing regression analysis. This is the case in both Germany and Austria. Nevertheless, the results show that the age of the respondents is a significant factor affecting whether or not Austrian and German citizens at the age of 60 (women in Austria) and 65 (men in Austria and both men and women in Germany) or older receive income from gainful employment. The coefficient for age is negative in both countries. This implies that the older a person gets, the less likely they are in employment. This is also confirmed in the literature. As described in section 5, these two continental European countries have both reformed their pension systems in order to be more sustainable for future demographic challenges. One crucial goal of these reforms was to increase the factual retirement age. As tables 6 and 7 show, both countries have made important progress in raising the labor market participation rates for older workers by implementing active and passive labor market policies. Comparing the effect sizes, it seems like age is a more important factor in Austria for receiving income from gainful employment in the last year than in Germany. In Austria, it is observable that with every year a person gets older, the odds of having income from gainful employment decrease by 16.2%. In Germany, the effect is a little weaker, with a decrease of only 11% per year of ageing.

Additionally, the receipt of public pension benefits and having received income from employment in the last year are significantly negative correlated in Germany. This is not surprising, since one would assume that the receipt of pension benefits eases the need for additional income. The odds of having received income from gainful employment in the last year decrease by 59.1% with the receipt of public pension benefits. The effect size is still quite interesting, since, as stated in the literature review, the net replacement rate of Germany's pay-as-you-go public pension scheme has been decreased rather drastically and its statutory retirement age has been raised (Bäcker 2018b). Since additional benefits from second and third pillar pensions cannot compensate the drastically lowered benefits from the public pillar (Blank et al. 2016b, Ebbinghaus 2018), staying in the labor market, I argued, might be a necessity one cannot avoid. This also goes against Hofäcker & Naumann (2015), who state a multitude of reasons for a trend towards late retirement in Germany. Apart from the obvious benefit retrenchment described above, late retirement might have to do with a longer disability-free life expectancy as well as structural economic change and the educational expansion (Hofäcker & Naumann 2015, 474).

In comparison to Germany in Austria, the receipt of a public pension and income from gainful employment do not correlate significantly. As the literature suggests, this might be because of the institutional difference to Germany. Austria and Germany have taken different paths in tackling pension reformation, in which Austria has stuck to a strong public pension pillar and Germany has chosen to move towards a multi-pillar system (Blank et al. 2016b). One explanation for the insignificant correlation between public pension benefits and employment beyond the retirement age might be that, as Hofäcker et al. (2019) point out correctly, the public pension net replacement rate of lifetime earnings is rather high compared to other European countries and especially compared to Germany. A prolonged working life might rather be a voluntary activity in retirement, than a necessity. Hofäcker et al. (2019) find evidence, that this is true especially for those with a high level of education.

Furthermore, the whole SHARE sample gives more insight into the factors affecting employment in retirement age. The control variables for Germany and Austria show that the Austrian population is less likely to be employed in old age compared to the SHARE average. Germany shows a weaker negative coefficient. However, the coefficient is not significant. Looking at the strength of both coefficients, though, it is observable that Austrians are less likely to retire late than Germans. This finding is also confirmed in the literature for earlier waves of SHARE (Axelrad 2018, Börsch-Supan et al. 2009). Moreover, the regression analysis for the SHARE population shows a significantly negative coefficient for the receipt of public pension benefits for all SHARE countries. This implies that the odds for being in employment in old age decrease with the receipt of benefits from a public pension. On the contrary, the odds of being in employment increase with the receipt of occupational pension benefits and payments from a private life insurance.

Whereas the variables for all levels of educational attainment have been insignificant for both Austria and Germany, they are significant in the SHARE sample. As suggested by previous studies, the odds for respondents to work in retirement age are highest for those with a high level of education (Hofäcker et al. 2016, Hofäcker & Naumann 2015, Scherger 2013). In contrast, they are the lowest for respondents with a low level of education in this study. Hofäcker et al. (2016) suggest that those with a high level of education stay in the labor market intrinsically, whereas the less educated retire involuntarily, for instance due to health reasons. Unfortunately, this cannot be confirmed for Germany and Austria individually.

Even though the data on most of the variables in the regression models for both Germany and Austria are insignificant, I would still, with caution, argue, that there are differences in the need-factors regarding employment in retirement age. The age of respondents in Austria has a stronger negative influence on having received income from employment in the last year than in Germany. According to the SHARE sample regression, the odds for Austrians to have income from employment are lower than for Germans. In addition, the results for educational attainment in the SHARE sample and in previous literature point towards being in employment is rather voluntary in Austria (Axelrad 2018, Hofäcker & Naumann 2015, Scherger 2013). Therefore, Hypothesis 1 can only be partly confirmed and with caution. There is a tendency towards it being more necessary for Germans to prolong their working life than for Austrians.

Unfortunately, Hypothesis 2 regarding significant differences in different sectors of employment cannot be answered. As a result of lacking observations, the variables on sectors of employment could not be included in the regression analysis. Nevertheless, the descriptive data for all samples show a clear tendency. In all 3 samples, the majority of workers claimed to work in the service sector (108 out of 177 in the SHARE sample and 16 out of 20 in Austria and Germany). Even though this could not be investigated properly, a tendency is observable. Wiß et al. (2019) and De Preter et al. (2012) also found that workers in the service sector retired the latest.

At last, no statistical significance could be found for different levels of education in Austria and Germany. This might be due to the small sample size. The logistic regression analysis for the SHARE population suggests that the odds of having received income from gainful employment in the last year are higher the higher the level of education is. Although insignificant, this connection can also be observed in the regression models for each of the two countries. In chapter 2, I hypothesized that workers in Austria with a high level of education are more likely to retire after the statutory pension age than those with lower levels of education (Hypothesis 3). With caution, I confirm this hypothesis, since the significance of a high level of education is not only shown significantly in the SHARE population regression, but also previous studies (Hofäcker et al. 2016, Hofäcker & Naumann 2015, Scherger 2013). Furthermore, interpreting the insignificant coefficients in the Austrian sample, the same pattern is noticeable. Interestingly, Hypothesis 4, in which I hypothesize that workers with low and high rather than medium levels of education tend to work beyond retirement age, needs to be rejected. Although insignificant, the German sample shows the same pattern as the Austrian and SHARE population, indicating that those with low levels of education are the least likely to work

beyond the retirement age. Therefore, the argumentation of Hofäcker et al. (2016), who raise awareness of the least educated also usually having started to work earliest and thus being eligible for pension benefits rather early, can be confirmed in this analysis.

9. CONCLUSION

Germany and Austria, two continental, Bismarckian welfare regimes, are in a similar need to make their pension systems financially sustainable for the future. Both countries have been working towards keeping older workers aged 50+ in the labor market for as long as possible and guaranteeing the financial sustainability of their public pay-as-you-go pension schemes while cutting benefits, with different measures. With Germany having reformed its public pension system to be less generous and citizens receiving lower benefits, the question arises if those, who work beyond the statutory retirement age, work out of necessity or voluntarily. Furthermore, it is unclear which demographic characteristics those citizens have, who work beyond the retirement age in Germany and Austria.

This study explored the role of pension benefits, individual (gender, education) and occupational (sector of employment) factors as well as how they influence the timing of retirement. Germany and Austria were compared using data from the Survey of Health, Ageing and Retirement (SHARE) wave 7. SHARE provides the necessary tools to analyze all factors in depth and investigate links between those factors. Whereas there is a large body of literature on retirement timing, using the latest wave of SHARE allowed to investigate, if certain indicators of working in retirement changed throughout the last years. Specifically, the aim of this thesis was to look at Austria and Germany in depth and compare how the factors explained above affect employment of those aged 65 and older. Separate binary logistic regression models were created to highlight the importance of each factor affecting retirement timing in each country. Additionally, the regression models for both countries were compared with a similar regression model for all SHARE countries together. This comparison was carried out due to the very small sample sizes for the Austrian and German sample and to highlight that the independent variables are in fact an important indicator for or against having received income from gainful employment in old age.

This study shows that age, above all, is a key characteristic when exploring income from employment in a population above the retirement age. Age is a significant predictor for having income from employment in older age for both Austria and Germany but has an even stronger effect in Austria. As previous literature has suggested, Austria still seems to be an early retirement country, where the receipt of public pension benefits does not affect the odds of being employed in later life. On the

contrary, the receipt of benefits from a public pension does affect income from employment in old age negatively.

Furthermore, it is noticeable that a high level of education increases the odds of having received income from gainful employment in the last year in retirement age in both countries. The literature review in this thesis points towards differences in the explanations for this group to prolong their working life. It is suggested that those with higher levels of education in Germany work out of financial need, whereas Austrians work longer out of intrinsic reasons. The correlation seems linear: The higher the educational attainment, the more likely to work beyond the retirement age.

With various scholars asking if social inequality in old age has increased since the turn of the millennium, this thesis aims at providing knowledge to support this process of finding out. This research, though, is limited in its explanatory power due to the small sample sizes in the regression models. Further research needs to focus more on the question, if funded pension schemes definitively contribute to a secure income in old age or if the gap between poor and rich increases.

10. REFERENCES

Anderson, Karen M. 2015. Pension Reform in Europe. Context, Drivers, Impact. In *Paid work beyond pension age: comparative perspectives*, ed. Simone Scherger, 177-197. Houndmills, Basingstoke, Hampshire, New York, NY: Palgrave Macmillan.

Austrian Institute of Economic Research (WIFO). 2019. Langfristige Perspektiven der öffentlichen Finanzen in Österreich. Vienna.

Axelrad, Hila. 2018. Early Retirement and Late Retirement: Comparative Analysis of 20 European Countries. *International Journal of Sociology* 48:231–250.

Bäcker, Gerhard. 2018a. Alterssicherung in Deutschland. In *Handbuch Soziologie des Alter(n)s*, eds. Klaus R. Schroeter, Claudia Vogel and Harald Künemund, 1-26. Wiesbaden: Springer Fachmedien Wiesbaden.

Bäcker, Gerhard. 2018b. Dauerbaustelle Sozialstaat. Chronologie gesetzlicher Neuregelungen in der Sozialpolitik 1998 - 2017. Duisburg.

Bäcker, Gerhard, Gerhard Naegele, Reinhard Bispinck, Klaus Hofemann and Jennifer Neubauer. 2008. *Sozialpolitik und soziale Lage in Deutschland*. Wiesbaden: VS Verlag für Sozialwissenschaften.

Been, Jim, Koen Caminada, Kees Goudswaard and Olaf van Vliet. 2017. Public/Private Pension Mix, Income Inequality and Poverty among the Elderly in Europe: An Empirical Analysis Using New and Revised OECD Data. *Social Policy & Administration* 51:1079–1100.

Blank, Florian, Camille Logeay, Erik Türk, Josef Wöss and Rudolf Zwiener. 2016a. ALTERSSICHERUNG IN DEUTSCHLAND UND ÖSTERREICH: VOM NACHBARN LERNEN? *WSI-Report* 27:40.

Blank, Florian, Camille Logeay, Erik Türk, Josef Wöss and Rudolf Zwiener. 2016b. Österreichs Alterssicherung: Vorbild für Deutschland? *Wirtschaftsdienst* 96:279-286.

Blank, Florian, Camille Logeay, Erik Türk, Josef Wöss and Rudolf Zwiener. 2016c. Why is Austria's Pension System So Much Better Than Germany's? *Intereconomics* 51:118-125.

Börsch-Supan, Axel, Martina Brandt, Christian Hunkler, Thorsten Kneip, Julie Korbmacher, Frederic Malter, Barbara Schaan, Stephanie Stuck and Sabrina Zuber. 2013. Data Resource Profile: The Survey of Health, Ageing and Retirement in Europe (SHARE). *International Journal of Epidemiology* 42:992-1001.

Börsch-Supan, Axel, Agar Brugiavini and Enrica Croda. 2009. The role of institutions and health in European patterns of work and retirement. *Journal of European Social Policy* 19:341-358.

Bridgen, Paul, and Traute Meyer. 2014. The Liberalisation of the German Social Model: Public–Private Pension Reform in Germany since 2001. *Journal of Social Policy* 43:37-68.

Bundeskanzleramt. 2007. Regierungsprogramm 2007 - 2010. Regierungsprogramm für die XXIII. Gesetzgebungsperiode. Wien.

Bundesministerium für Arbeit und Soziales. 2020. Rentenlexikon. Teilrente. https://www.bmas.de/DE/Themen/Rente/Rentenlexikon/Functions/glossar.html;jsessionid=A0290D41021A4F2780ECCC8E38FB1F47?cms_lv2=75204&cms_lv3=85896#glossar85896.

De Preter, Hanne, Dimitri Mortelmans and Dorien van Looy. 2012. Retirement timing in Europe: does sector make a difference? *Industrial Relations Journal* 43:511–526.

De Preter, Hanne, Dorien van Looy and Dimitri Mortelmans. 2013. Individual and institutional push and pull factors as predictors of retirement timing in Europe: A multilevel analysis. *Journal of aging studies* 27:299–307.

De Vaus, David A. 2002. *Surveys in social research*. 5. ed. London: Routledge.

Dingemans, Ellen, and Katja Möhring. 2019. A life course perspective on working after retirement: What role does the work history play? *Advances in Life Course Research* 39:23--33.

Ebbinghaus, Bernhard. 2011a. Introduction: Studying Pension Privatization in Europe. In *The varieties of pension governance: pension privatization in Europe*, ed. Bernhard Ebbinghaus, 3-22. Oxford, New York: Oxford University Press.

Ebbinghaus, Bernhard, ed. 2011b. The varieties of pension governance. Pension privatization in Europe. Oxford: Oxford University Press.

Ebbinghaus, Bernhard. 2018. Privatisierung und Vermarktlichung der Altersvorsorge: Eingetrübte Aussichten des deutschen Mehrsäulenmodells. *WSI-Mitteilungen* 71:468–475.

Ebbinghaus, Bernhard, Mareike Gronwald and Tobias Wiß. 2011. Germany: Departing from Bismarckian Public Pensions. In *The varieties of pension governance. Pension privatization in Europe*, ed. Bernhard Ebbinghaus, 119-150. Oxford: Oxford University Press.

Ebbinghaus, Bernhard, and Jörg Neugschwender. 2011. The Public-Private Pension Mix and Old Age Income Inequality in Europe. In *The varieties of pension governance: pension privatization in Europe*, ed. Bernhard Ebbinghaus, 384-422. Oxford, New York: Oxford University Press.

Esping-Andersen, Gøsta. 2007. *The three worlds of welfare capitalism*. Reprint. Cambridge: Polity Press.

Eurostat. 2019. Ageing Europe - statistics on pensions, income and expenditure. The risk of poverty among older people. https://ec.europa.eu/eurostat/statistics-explained/index.php/Ageing_Europe_-_statistics_on_pensions,_income_and_expenditure#Pensions.

Eurostat. 2020a. Employment rates by sex, age and citizenship (lfsa_ergan): Eurostat.

Eurostat. 2020b. People at risk of poverty or social exclusion by age and sex (ilc_peps01): Eurostat.

Federal Ministry of Finance (BMF). 2018. Austrian Country Fiche on Public Pensions. https://ec.europa.eu/info/sites/info/files/economy-finance/final_country_fiche_at.pdf.

Federal Ministry of Finance (BMF). 2020. Versteuerung der Pension. Einkommenssteuer. https://www.oesterreich.gv.at/themen/arbeit_und_pension/pension/Seite.270221.html#Links.

Federal Ministry of Labour, Social Affairs and Consumer Protection (BMASK). 2016. *The Austrian welfare state. Benefits, expenditure and financing 2016*. Vienna.

Federal Ministry of Labour, Social Affairs, Health, and Consumer Protection. 2018. *Fundamentals of the Austrian Pensions System. For 2018 - Summary*. Vienna: Federal Ministry of Labour, Social Affairs, Health and Consumer Protection (BMAGSK).

Fromm, Sabine. 2012. Logistische Regressionsanalyse. In *Datenanalyse mit SPSS für Fortgeschrittene 2: Multivariate Verfahren für Querschnittsdaten*, 107-158. Wiesbaden: VS Verlag für Sozialwissenschaften.

Hank, Karsten, and Julie M. Korbmacher. 2013. PARENTHOOD AND RETIREMENT. *European Societies* 15:446–461.

Hinrichs, Karl. 2000. Elephants on the move. Patterns of public pension reform in OECD countries. *European Review* 8:353-378.

Hofäcker, D., and E. Naumann. 2015. The emerging trend of work beyond retirement age in Germany. *Zeitschrift für Gerontologie und Geriatrie* 48:473-479.

Hofäcker, Dirk, Moritz Hess and Stefanie König. 2019. Wandel von Ruhestandsübergängen im politischen Paradigmenwechsel Europas. *Zeitschrift für Gerontologie und Geriatrie* 52:40-51.

Hofäcker, Dirk, and Jonas Radl. 2016. Retirement Transitions in Times of Institutional Change: Theoretical Concept. In *Delaying Retirement*, eds. Dirk Hofäcker, Moritz Hess and Stefanie König, 1-21. London: Palgrave Macmillan UK.

Hofäcker, Dirk, Heike Schröder, Yuxin Li and Matthew Flynn. 2016. Trends and Determinants of Work-Retirement Transitions under Changing Institutional Conditions: Germany, England and Japan compared. *Journal of Social Policy* 45:39–64.

Hosmer, David W., and Stanley Lemeshow. 1989. *Applied logistic regression*. New York: Wiley.

Karasek, Robert, and Töres Theorell. 1990. Healthy work: stress, productivity, and the reconstruction of working life. New York: Basic Books.

Knell, Markus, Walpurga Köhler-Töglhofer and Doris Prammer. 2006. The Austrian Pension System. How Recent Reforms Have Changed Fiscal Sustainability and Pension Benefits. *Monetary Policy and the Economy:*69–93.

König, Stefanie, Moritz Hess and Dirk Hofäcker. 2016. Trends and Determinants of Retirement Transition in Europe, the USA and Japan: A Comparative Overview. In *Delaying retirement: progress*

and challenges of active ageing in {Europe}, the {United} {States} and {Japan}, eds. Dirk Hofäcker, Moritz Hess and Stefanie König, 23-51. London, United Kingdom: Palgrave Macmillan.

Larsen, Mona, and Peder J. Pedersen. 2017. Labour force activity after 65: what explain recent trends in Denmark, Germany and Sweden? *Journal for Labour Market Research* 50:15-27.

Mayrhuber, Christine. 2006. Pension Levels and Income Replacement Ratios after the Adoption of the General Retirement Income Act. *WIFO-Monatsberichte* 79:805–816.

Mayrhuber, Christine, Christoph Badelt and Anna Brunner. 2019. Durchrechnung in der Pensionsversicherung: Langfristige Implikationen. *Wirtschaft und Gesellschaft* 45:349–366.

Möhring, Katja. 2015. Employment Histories and Pension Incomes in Europe: A multilevel analysis of the role of institutional factors. *European Societies* 17:3-26.

Obinger, Herbert, Peter Starke, Julia Moser, Claudia Bogedan, Edith Gindulis and Stephan Leibfried. 2010. *Transformations of the welfare state. Small states, big lessons*. Oxford: Oxford Univ. Press.

Obinger, Herbert, and Emmerich Talos. 2010. Janus-Faced Developments in a Prototypical Bismarckian Welfare State: Welfare Reforms in Austria since the 1970s. In *A long goodbye to Bismarck? the politics of welfare reforms in continental Europe.* Changing welfare states, ed. Bruno Palier, 101-128. Amsterdam: Amsterdam University Press.

Obinger, Herbert, and Emmerich Tálos. 2006. *Sozialstaat Österreich zwischen Kontinuität und Umbau. Eine Bilanz der ÖVP/FPÖ/BZÖ-Koalition*. Wiesbaden: VS Verlag für Sozialwissenschaften | GWV Fachverlage GmbH Wiesbaden.

OECD. 2019. Pensions at a glance 2019. Key findings for Germany. https://www.oecd.org/germany/PAG2019-DEU.pdf.

OECD. 2020. Labour Force participation rate (indicator): OECD.

Paster, Thomas. 2014. Why Did Austrian Business Oppose Welfare Cuts? How the Organization of Interests Shapes Business Attitudes Toward Social Partnership. *Comparative Political Studies* 47:966–992.

Pleau, Robin L. 2010. Gender Differences in Postretirement Employment. *Research on Aging* 32:267–303.

Scherger, Simone. 2013. Zwischen Privileg und Bürde. Erwerbstätigkeit jenseits der Rentengrenze in Deutschland und Großbritannien. *Zeitschrift für Sozialreform* 59.

Schludi, Martin. 2005. Reform of Bismarckian pension systems. A comparison of pension politics in Austria, France, Germany, Italy and Sweden. Amsterdam: Amsterdam University Press.

Schmidthuber, Lisa, Heike Schröder and Edmund Panzenböck. 2016. Retirement Determinants in Austria: An Aging Society but a Hesitant Policymaker!? In *Delaying retirement: progress and challenges of active ageing in {Europe}, the {United} {States} and {Japan}*, eds. Dirk Hofäcker, Moritz Hess and Stefanie König, 195-219. London, United Kingdom: Palgrave Macmillan.

Schmitz, Jutta. 2018. Erwerbstätigkeit im Rentenalter – sozialpolitische Probleme und Implikationen. In *Arbeit im Alter*, eds. Simone Scherger and Claudia Vogel, 99-123. Wiesbaden: Springer Fachmedien Wiesbaden.

Schmitz-Kießler, Jutta. 2019. Erwerbstätigkeit trotz Rente? Zum Bestand, den Motiven, und der sozialpolitischen Einordnung von erwerbstätigen Rentnerinnen und Rentnern. Dissertation.

Schröder, Mathis. 2011. Retrospective data collection in the Survey of Health, Ageing and Retirement in Europe. SHARELIFE Methodology. Mannheim: Mannheim Research Institute for the Economics of Aging (MEA).

Siegrist, Johannes, Dagmar Starke, Tarani Chandola, Isabelle Godin, Michael Marmot, Isabelle Niedhammer and Richard Peter. 2004. The measurement of effort–reward imbalance at work: European comparisons. *Social Science \& Medicine* 58:1483-1499.

Statistik Austria. 2020. Pensionierungstafeln Bundesländer. Ergebnisse für das Jahr 2018. https://www.statistik.at/web_de/statistiken/menschen_und_gesellschaft/soziales/sozialleistungen_auf_bundesebene/pensionen_und_renten/index.html.

Statistisches Bundesamt (Destatis). 2020. Gesetzlich Rentenversicherte. Erwerbsbevölkerung überwiegend rentenversichert.

https://www.destatis.de/DE/Themen/Arbeit/Arbeitsmarkt/Qualitaet-Arbeit/Dimension-4/gesetzlich-rentenversichertel.html.

Tálos, Emmerich. 1981. *Staatliche Sozialpolitik in Österreich. Rekonstruktion und Analyse*. Zugl.: Wien, Univ., Habil.-Schr., 1980 u.d.T.: Talos, Emmerich: Dimensionen staatlicher Sozialpolitik, vol. 5. 2. Aufl. Wien: Verl. für Gesellschaftskritik.

Türk, Erik. 2019. Die Entwicklung des effektiven Pensionsantrittsalters. Tarnen, Täuschen und Fake News? Mehr Sachlichkeit dringend erforderlich. *Wirtschaft und Gesellschaft* 45:367–389.

Wahrendorf, Morten, Bola Akinwale, Rebecca Landy, Katey Matthews and David Blane. 2017. Who in Europe Works beyond the State Pension Age and under which Conditions? Results from SHARE. *Journal of Population Ageing* 10:269–285.

Wiß, Tobias, Lisa Schmidthuber and Valeria Bordone. 2019. Quality of working conditions, sector of employment and age at retirement. *Management Revue – Socio-Economic Studies:*1-34.

Wörz, Markus. 2011. *Old-Age Provisions in Germany: Changes in the Retirement System since the 1980s* P I 2011-208: Sociel Science Research Center Berlin (WZB).

1. SHARE data disclosure

The SHARE data collection has been funded by the European Commission through FP5 (QLK6-CT-2001-00360), FP6 (SHARE-I3: RII-CT-2006-062193, COMPARE: CIT5-CT-2005-028857, SHARELIFE: CIT4-CT-2006-028812), FP7 (SHARE-PREP: GA N°211909, SHARE-LEAP: GA N°227822, SHARE M4: GA N°261982) and Horizon 2020 (SHARE-DEV3: GA N°676536, SERISS: GA N°654221) and by DG Employment, Social Affairs & Inclusion. Additional funding from the German Ministry of Education and Research, the Max Planck Society for the Advancement of Science, the U.S. National Institute on Aging (U01_AG09740-13S2, P01_AG005842, P01_AG08291, P30_AG12815, R21_AG025169, Y1-AG-4553-01, IAG_BSR06-11, OGHA_04-064, HHSN271201300071C) and from various national funding sources is gratefully acknowledged (see www.share-project.org).

11. APPENDIX

1. Descriptive results

Austria

Age		
N	Valid	461
	Missing	0
Mean		74,76
Median		74,00
Std. Deviation		7,698
Skewness		0,359
Std. Error of Skewness		0,114
Kurtosis		-0,482
Std. Error of Kurtosis		0,227
Minimum		60
Maximum		97

a. Country identifier = Austria

Gender		
N	Valid	461
	Missing	0
Mean		0,3601
Median		0,0000
Std. Deviation		0,48055
Skewness		0,585
Std. Error of Skewness		0,114
Kurtosis		-1,665
Std. Error of Kurtosis		0,227
Minimum		0,00
Maximum		1,00

a. Country identifier = Austria

Income

N	Valid	461
	Missing	2086
Mean		0,0629
Median		0,0000
Std. Deviation		0,24306
Skewness		3,612
Std. Error of Skewness		0,114
Kurtosis		11,097
Std. Error of Kurtosis		0,227
Minimum		0,00
Maximum		1,00

a. Country identifier = Austria

Consumption

N	Valid	348
	Missing	113
Mean		3,4655
Median		4,0000
Std. Deviation		0,73329
Skewness		-1,203
Std. Error of Skewness		0,131
Kurtosis		0,704
Std. Error of Kurtosis		0,261
Minimum		1,00
Maximum		4,00

a. Country identifier = Austria

Pensions and Life Insurane

		public	occupational	private	life insurance
N	Valid	461	459	458	458
	Missing	0	2	3	3
Mean		0,8243	0,0370	0,0087	0,0109
Median		1,0000	0,0000	0,0000	0,0000
Std. Deviation		0,38098	0,18906	0,09315	0,10403
Skewness		-1,710	4,919	10,595	9,444
Std. Error of Skewness		0,114	0,114	0,114	0,114
Kurtosis		0,928	22,294	110,727	87,577
Std. Error of Kurtosis		0,227	0,227	0,228	0,228
Minimum		0,00	0,00	0,00	0,00
Maximum		1,00	1,00	1,00	1,00

Levels of Education				
		Low	Mediuma	High
N	Valid	457	457	457
	Missing	4	4	4
Mean		0,3151	0,4726	0,2123
Median		0,0000	0,0000	0,0000
Std. Deviation		0,46506	0,49980	0,40935
Skewness		0,799	0,110	1,412
Std. Error of Skewness		0,114	0,114	0,114
Kurtosis		-1,368	-1,997	-0,006
Std. Error of Kurtosis		0,228	0,228	0,228
Minimum		0,00	0,00	0,00
Maximum		1,00	1,00	1,00

Germany

Age

N	Valid	676
	Missing	0
Mean		73,94
Median		73,00
Std. Deviation		6,661
Skewness		0,633
Std. Error of Skewness		0,094
Kurtosis		-0,183
Std. Error of Kurtosis		0,188
Minimum		65
Maximum		96

a. Country identifier = Germany

Gender

N	Valid	676
	Missing	0
Mean		0,4941
Median		0,0000
Std. Deviation		0,50034
Skewness		0,024
Std. Error of Skewness		0,094
Kurtosis		-2,005
Std. Error of Kurtosis		0,188
Minimum		0,00
Maximum		1,00

a. Country identifier = Germany

Income

N	Valid	676
	Missing	1564
Mean		0,1287
Median		0,0000
Std. Deviation		0,33511
Skewness		2,223
Std. Error of Skewness		0,094
Kurtosis		2,948
Std. Error of Kurtosis		0,188
Minimum		0,00
Maximum		1,00

a. Country identifier = Germany

Consumption

N	Valid	472
	Missing	204
Mean		3,4407
Median		4,0000
Std. Deviation		0,77424
Skewness		-1,303
Std. Error of Skewness		0,112
Kurtosis		1,069
Std. Error of Kurtosis		0,224
Minimum		1,00
Maximum		4,00

a. Country identifier = Germany

Pensions and Life Insurance

		public	occupational	private	life insurance
N	Valid	673	674	675	675
	Missing	3	2	1	1
Mean		0,9643	0,2789	0,0341	0,0296
Median		1,0000	0,0000	0,0000	0,0000
Std. Deviation		0,18558	0,44881	0,18155	0,16969
Skewness		-5,019	0,988	5,148	5,560
Std. Error of Skewness		0,094	0,094	0,094	0,094
Kurtosis		23,260	-1,027	24,574	29,004
Std. Error of Kurtosis		0,188	0,188	0,188	0,188
Minimum		0,00	0,00	0,00	0,00
Maximum		1,00	1,00	1,00	1,00

Levels of Education

		Low	Medium	High
N	Valid	673	673	673
	Missing	3	3	3
Mean		0,1040	0,5513	0,3447
Median		0,0000	1,0000	0,0000
Std. Deviation		0,30550	0,49774	0,47563
Skewness		2,600	-0,207	0,655
Std. Error of Skewness		0,094	0,094	0,094
Kurtosis		4,775	-1,963	-1,576
Std. Error of Kurtosis		0,188	0,188	0,188
Minimum		0,00	0,00	0,00
Maximum		1,00	1,00	1,00

SHARE

Pensions and Life Insurance

		public	occupational	private	life insurance
N	Valid	11052	10270	10990	10990
	Missing	31	813	93	93
Mean		0,7914	0,1415	0,0401	0,0129
Median		1,0000	0,0000	0,0000	0,0000
Std. Deviation		0,40630	0,34853	0,19627	0,11294
Skewness		-1,435	2,058	4,687	8,627
Std. Error of Skewness		0,023	0,024	0,023	0,023
Kurtosis		0,059	2,235	19,972	72,441
Std. Error of Kurtosis		0,047	0,048	0,047	0,047
Minimum		0,00	0,00	0,00	0,00
Maximum		1,00	1,00	1,00	1,00

Age

N	Valid	11083
	Missing	0
Mean		74,98
Median		74,00
Std. Deviation		7,244
Skewness		0,614
Std. Error of Skewness		0,023
Kurtosis		-0,372
Std. Error of Kurtosis		0,047
Minimum		65
Maximum		104

Consumption

N	Valid	7799
	Missing	3284
Mean		2,8860
Median		3,0000
Std. Deviation		1,05076
Skewness		-0,430
Std. Error of Skewness		0,028
Kurtosis		-1,088
Std. Error of Kurtosis		0,055
Minimum		1,00
Maximum		4,00

Austria and Germany

		Austria	Germany
N	Valid	11083	11083
	Missing	0	0
Mean		0,0384	0,0610
Median		0,0000	0,0000
Std. Deviation		0,19226	0,23933
Skewness		4,802	3,669
Std. Error of Skewness		0,023	0,023
Kurtosis		21,066	11,466
Std. Error of Kurtosis		0,047	0,047
Minimum		0,00	0,00
Maximum		1,00	1,00

Gender

N	Valid	11083
	Missing	0
Mean		0,4438
Median		0,0000
Std. Deviation		0,49686
Skewness		0,226
Std. Error of Skewness		0,023
Kurtosis		-1,949
Std. Error of Kurtosis		0,047
Minimum		0,00
Maximum		1,00

Income

N	Valid	11083
	Missing	34846
Mean		0,0903
Median		0,0000
Std. Deviation		0,28665
Skewness		2,859
Std. Error of Skewness		0,023
Kurtosis		6,175
Std. Error of Kurtosis		0,047
Minimum		0,00
Maximum		1,00

Levels of Education

		Low	Medium	High
N	Valid	10468	10468	10468
	Missing	615	615	615
Mean		0,4663	0,3285	0,2052
Median		0,0000	0,0000	0,0000
Std. Deviation		0,49889	0,46970	0,40386
Skewness		0,135	0,730	1,460
Std. Error of Skewness		0,024	0,024	0,024
Kurtosis		-1,982	-1,467	0,132
Std. Error of Kurtosis		0,048	0,048	0,048
Minimum		0,00	0,00	0,00
Maximum		1,00	1,00	1,00

2. SPSS Syntax

```
**income from employment last year
recode ep204_ (-2 thru -1=sysmis) (1=1) (5=0) INTO ep204_rec.
variable labels ep204_rec 'income from dependent employment last year'.
value labels ep204_rec
1 'yes'
0 'no'.
EXECUTE.
recode ep206_ (-2 thru -1=sysmis) (1=1) (5=0) INTO ep206_rec.
variable labels ep206_rec 'income from independent employment last year'.
value labels ep206_rec
1 'yes'
0 'no'.
EXECUTE.
compute allincome=sum(ep206_rec,ep204_rec).
recode allincome (2 thru hi=1).
value labels allincome
0 'no income'
1 'income'.

**education grouped - three groups
recode isced1997_r (1 thru 2=1) (3 thru 4=2) (5 thru 6=3) (else=sysmis) into education.
variable labels education 'education grouped'.
value labels education
1 'low level of education'
2 'medium level of education'
```

```
3 'high level of education'.
EXECUTE.
compute low_education=education=1.
compute medium_education=education=2.
compute high_education=education=3.

**is household able to make ends meet
recode co007_ (-2 thru -1=sysmis) (else=COPY) into consumption.
VARIABLE LABELS consumption 'is household able to make ends meet'.
value labels consumption
1 'with great difficulty'
2 'with some difficulty'
3 'fairly easily'
4 'easily'.
recode co007_ (1=1) (2 thru 4=0) (else=sysmis) into co007_greatdiff.
VARIABLE LABELS co007_greatdiff 'household able to make ends meet with great difficulty'.
value labels co007_greatdiff
1 'yes'
0 'no'.
EXECUTE.
recode co007_ (1=0) (2=1) (3 thru 4=0) (else=sysmis) into co007_somediff.
VARIABLE LABELS co007_somediff 'household able to make ends meet with some difficulty'.
value labels co007_somediff
1 'yes'
0 'no'.
EXECUTE.
```

```
recode co007_ (1 thru 2=0) (3=1) (4=0) (else=sysmis) into co007_fairlyeasily.
VARIABLE LABELS co007_fairlyeasily 'household able to make ends meet fairly easily'.
value labels co007_fairlyeasily
1 'yes'
0 'no'.
EXECUTE.
recode co007_ (4=1) (1 thru 3=0) (else=sysmis) into co007_easily.
VARIABLE LABELS co007_easily 'household able to make ends meet easily'.
value labels co007_easily
1 'yes'
0 'no'.
EXECUTE.

**gender dummy
recode gender (2=0) (1=1) (else=sysmis) into gender_dummy.
variable labels gender_dummy 'gender (1=male)'.
value labels gender_dummy
1 'male'
0 'female'.
EXECUTE.

**public pension recoded
recode ep671d1 (0=0) (1=1) (else=sysmis) into public_pension.
value labels public_pension
1 'receipt'
0 'no receipt'.
```

recode ep624_ (5=0) (1=1) (else = sysmis) into occup_pensions.

value labels occup_pensions

1 'receipt'

0 'no receipt'.

**private pensions recoded

recode ep089d2 (0=0) (1=1) (else = sysmis) into private_pensions.

value labels private_pensions

1 'receipt'

0 'no receipt'.

**life insurance recoded

recode ep089d1 (0=0) (1=1) (else = sysmis) into life_insurance.

value labels life_insurance

1 'receipt'

0 'no receipt'.

** sectors of employment - need to leave out

recode ep018_ (-2 thru -1=sysmis) (1=1) (3=6) (11 thru 14=5) (7=5) (2=2) (4 thru 5=2) (6=3) (8=3) (9 thru 10=4) into ep018_rec.

variable labels ep018_rec 'sector of employment working in now grouped'.

value labels ep018_rec

1 'primary'

2 'industry'

3 'trade'

4 'finance'

5 'service'

6 'manufacturing'.

EXECUTE.

fre ep018_rec.

**FILTERS for Austria AND Germany sample, later extra filter for each country; filters need to be on always

COMPUTE men65=(gender = 1) & (age_int >= 65).

EXECUTE.

COMPUTE women60=(gender = 2) & (age_int >= 60) & (country=11).

EXECUTE.

COMPUTE women65=(gender = 2) & (age_int >= 65) & (country=12).

EXECUTE.

SELECT IF (men65=1) or (women65=1) or (women60=1).

SELECT IF (country=11) or (country=12).

SELECT IF (allincome=0) or (allincome=1).

**filter for Austria - activate filter needed, if filter not needed anymore type “filter off.”

USE ALL.

COMPUTE filter_$=(country=11).

VARIABLE LABELS filter_$ 'country=11 (FILTER)'.

VALUE LABELS filter_$ 0 'Not Selected' 1 'Selected'.

FORMATS filter_$ (f1.0).

FILTER BY filter_$.

EXECUTE.

**filter for Germany - activate filter needed, if filter not needed anymore type “filter off.”

```
USE ALL.

COMPUTE filter_$=(country=12).

VARIABLE LABELS filter_$ 'country=12 (FILTER)'.

VALUE LABELS filter_$ 0 'Not Selected' 1 'Selected'.

FORMATS filter_$ (f1.0).

FILTER BY filter_$.

EXECUTE.
```

**Regression Austria – activate filter for Austria

```
LOGISTIC REGRESSION VARIABLES allincome

  /METHOD=ENTER education gender_dummy age_int public_pension

  /CONTRAST (education)=Indicator(1)

  /CONTRAST (gender_dummy)=Indicator(1)

  /CONTRAST (public_pension)=Indicator(1)

  /PRINT=ITER(1) CI(95)

  /CRITERIA=PIN(.05) POUT(.10) ITERATE(20) CUT(.5).
```

**Regression Germany - activate filter for Germany

```
LOGISTIC REGRESSION VARIABLES allincome

  /METHOD=ENTER education gender_dummy public_pension occup_pensions age_int private_pensions life_insurance

  /CONTRAST (education)=Indicator(1)

  /CONTRAST (gender_dummy)=Indicator(1)

  /CONTRAST (public_pension)=Indicator(1)

  /CONTRAST (private_pensions)=Indicator(1)

  /CONTRAST (occup_pensions)=Indicator(1)

  /CONTRAST (life_insurance)=Indicator(1)
```

```
 /PRINT=ITER(1) CI(95)

 /CRITERIA=PIN(.05) POUT(.10) ITERATE(20) CUT(.5).


**Regression SHARE with extra filter, without previous filters

COMPUTE men65=(gender = 1) & (age_int >= 65).

COMPUTE women65=(gender = 2) & (age_int >= 65).

EXECUTE.

SELECT IF (men65=1) or (women65=1).

compute austria= country=11.

compute germany= country=12.

LOGISTIC REGRESSION VARIABLES allincome

 /METHOD=ENTER austria germany age_int education gender_dummy co007_greatdiff
co007_somediff co007_fairlyeasily co007_easily public_pension occup_pensions private_pensions
life_insurance

 /CONTRAST (education)=Indicator(1)

 /CONTRAST (gender_dummy)=Indicator(1)

 /CONTRAST (public_pension)=Indicator(1)

 /CONTRAST (occup_pensions)=Indicator(1)

 /CONTRAST (life_insurance)=Indicator(1)

 /CONTRAST (private_pensions)=Indicator(1)

 /CONTRAST (co007_greatdiff)=Indicator(1)

 /CONTRAST (co007_somediff)=Indicator(1)

 /CONTRAST (co007_fairlyeasily)=Indicator(1)

 /CONTRAST (co007_easily)=Indicator(1)

 /PRINT=ITER(1) CI(95)

 /CRITERIA=PIN(0.05) POUT(0.10) ITERATE(20) CUT(0.5).
```