

**DIRECTORATE FOR FINANCIAL AND ENTERPRISE AFFAIRS
INSURANCE AND PRIVATE PENSIONS COMMITTEE**

Working Party on Private Pensions

**PROJECT ON RETIREMENT SAVINGS ADEQUACY:
PROGRESS REPORT - MODEL ASSUMPTIONS FOR GERMANY AND THE UNITED STATES**

28-29 November 2011

This document is circulated for discussion under the agenda of the WPPP meeting to be held on 28-29 November 2011.

This is a report of the work in progress. Delegates are invited to focus on the main assumptions and discuss whether they are appropriate or not to assess in the future the retirement readiness of different cohorts of workers.

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**PROJECT ON RETIREMENT SAVINGS ADEQUACY: PROGRESS REPORT - MODEL
ASSUMPTIONS FOR GERMANY AND THE UNITED STATES**

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1. Introduction

1. The goal of the WPPP project on retirement savings adequacy is to assess whether people are saving enough for retirement and to examine the role that private pensions play and could play in the retirement readiness of the working age population.¹ It aims at addressing several key policy questions to make sure that adequate policies are implemented to improve future retirees' savings and thus their well being. *Are people saving enough for retirement? Are private pensions fulfilling their complementary role in providing for retirement? Should policy makers introduce measures to increase retirement savings or to postpone retirement? Should these measures be targeted to specific population subgroups?* To answer those questions, the project consists of three phases. Only at the end it will be able to provide an appropriate answer. The first phase assesses how much individuals have to finance retirement, considering all pension sources, mainly state pensions, occupational pensions and personal pensions. Phase 2 extends the sources available to finance retirement by incorporating other savings that people can tap into at retirement (*e.g.* life insurance and housing). Ultimately, phase 3 compares retirement income with a suitable reference income to determine whether people are sufficiently prepared to finance their retirement.

2. This report focuses only on assessing the pension sources that different cohorts have or may have to finance retirement (*i.e.* phase 1). It does so for two countries, Germany and the United States. Therefore, the report presents work in progress in the retirement savings adequacy project and leaves the response to the policy questions to future reports. The work presented here looks at actual individuals and assesses how much in terms of pension sources, three different cohorts of individuals, current retirees, older workers (*i.e.*, those close to retirement, aged 55 to 64) and prime age workers (*i.e.*, those aged 35 to 54), have or may have to finance their retirement. The calculations use actual data from household surveys. Moreover, for current workers, actual data needs to be complemented with assumptions about what will happen between today and the time they retire (*e.g.* at what age current workers will retire?).

3. The purpose of this report is to present these calculations and discuss the appropriateness of the assumptions used to complement actual data. Therefore, the next sections discuss these assumptions, assessing their impact on the composition of the sources to finance retirement (*e.g.* between public pensions, private DB or DC pensions) for each of the three cohorts, according to different socio-economic variables (*e.g.* gender and income level). The report ends with a sensitivity analysis that examines whether changing some of those assumptions affects the composition of the different sources to finance retirement.

4. Section 2 succinctly describes the pension system in each country and introduces the assumptions used to project future pension income of current workers given actual survey data. The study estimates the amount of money that current workers may have when they retire by combining survey data with assumptions as to what will happen from the time of the survey until the day they retire. The study uses the rules currently in force in each country to project future pension income from social security, defined benefit (DB) and defined contribution (DC) pension plans (whether occupational or personal plans). Past labour histories are calculated for two different cohorts, the older workers and the prime age workers, to determine pension rights and approximate pension assets up to the actual date of the survey. Assumptions related to the age of retirement, the labour market status, the coverage rate of private pensions, accrual rates in DB plans, contribution rates in DC plans, market returns, and discount rates are then used to project their future pension income at retirement.

5. The next sections discuss the implications of the main assumptions. Section 3 shows the distribution of the different sources to finance retirement by socio economic variables for the three cohorts of workers (current retirees, older and prime age workers), while section 4 discusses the implication of

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changing the assumptions on the distributions of the different sources to finance retirement (i.e. sensitivity analysis). The main assumptions are the age of retirement (workers are assumed to retire at the official age of retirement or at the earliest retirement age possible); the employment status of individuals (they are assumed to maintain their current labour market situation: employed, unemployed or inactive, or to gain employment); the coverage of private pension plans (coverage can be assumed to remain constant or increase as people ages); and market returns. The sensitivity analysis shows that the age of retirement has the biggest impact on pension income, followed by market returns, the coverage rate of private pensions and the employment rate. Section 5 concludes.

6. Delegates are invited to address the following questions:

1. Do delegates agree with the approach taken to combine actual data with assumptions to assess the future retirement income of current workers? Are there any methodological issues that were not dealt with in this report?
2. Do delegates think that the starting assumption of keeping all constant at the time of the survey (e.g. employment status, coverage of private pensions), which it does not necessary coincide with reality, may lead to very restrictive assumptions? Should the project have an optimistic and a pessimistic scenario? Should we keep this starting assumption as the moderate scenario? Which will be in the opinion of delegates an optimistic scenario? What about a pessimistic scenario?
3. Should the calculations assume that current workers will retire at the official age of retirement, at the earliest possible, or set it up randomly? Should the calculations increase the coverage of private pensions with age as previous work showed or should the project assume that in the future most people will have a private pension? Should the model allow for people to suffer random unemployment spells?
4. The next steps in this project are to extend the sources available to finance retirement by incorporating other savings and housing (phase 2) and to compare retirement income with a suitable reference income to determine whether people are sufficiently prepared to finance their retirement (phase 3) for Germany and the United States. The Secretariat also plans to conduct the same analysis for additional countries, starting with Australia, Canada, Chile, Ireland, Italy, the Netherlands, Spain and the United Kingdom. For these countries, the data necessary to carry out the analysis are available. Do delegates agree with these next steps of the project? Would any additional country want to be included by providing the relevant data sources?

2. Projecting pension income for current workers

7. This section introduces the approach used to project the future income of current workers. The analysis considers all pension sources: state or social security pensions, occupational pensions and personal pensions. To estimate how much pension income current workers may have when they enter retirement, the study combines survey data with assumptions as to what will happen from the time of the survey until the day they retire. The analysis uses the 2010 SAVE² survey for Germany and the 2009 Panel Study of Income Dynamics (PSID) for the United States. Both are longitudinal studies that include information about households' income, wealth, labour market status, and pension coverage. They provide in particular information on workers' past labour histories and on their current level of assets in DC pension plans. This actual information, combined with assumptions as to individuals' career and asset accumulation from the time of survey until retirement, permits to assess the amount of pension resources to finance retirement. The 2009 and 2010 surveys are the more recent household data sets available for each country that permit

2. SAVE stands for *Sparen und Altersvorsorge in Deutschland*.

doing all the above calculations. Unfortunately, the calculations of pension income may be affected by the years the surveys were carried out. The financial and economic crisis may have affected, for example, the number of people in employment, and the value of the assets accumulated in pension plans.

8. Calculations are done for two working age subgroups, older workers who are close to retirement (*i.e.* those aged 55 to 64) and the prime age workers (*i.e.* those aged 35 to 54). The study shuns from the younger workers (*i.e.* those aged 16 to 24 and 25 to 34) as their past labour histories may be short or non-existent and thus strong assumptions about their future work histories would be required.³ More specifically, the study only looks at households where the head and his/her partner are aged 35 and older, at least one of the spouses is younger than 65, and the head of the household does not declare him/herself as retired and not in the labour force.

9. In what follows, the first sub-section describes the pension systems in Germany and the United States and the rules currently in force to calculate pension income from different sources. The second sub-section introduces the assumptions used in the model related to age of retirement, labour market status, private pensions' coverage, accrual rates in DB plans, contribution rates in DC plans, market returns, and discounts rates to project individuals' pension income at retirement.

Description of the pension systems in Germany and the United States

10. In Germany, only individuals with at least 5 years of contributions or 5 years of service in the public sector can claim social security benefits. Workers earn "pension points" each year for contributions paid into the social security system. Individuals earning an average income receive one point, while contributions based on lower or higher income earn proportionately less or more pension points, with a cap of 2 pension points. At retirement, the sum of all pension points is multiplied by a pension point value to obtain the pension benefit.⁴ A different formula is used for civil servants, who can claim a replacement rate of 1.79375% of their last wage every year of service worked in full time. Moreover, they are entitled to a maximum of 71.75% of their last wage after a career of 40 years of service.

11. In the United States, public and private sector workers earn a "credit" for each quarter of work and need at least 40 credits to be eligible to social security benefits (*i.e.*, 10 years). Social security benefits are based on Average Indexed Monthly Earnings (AIME). A worker's previous earnings to age 60 are restated in terms of today's wages by indexing past earnings to wage growth. The AIME is the average of the indexed earnings during the best 35 years, divided by 12. The monthly benefits then equal 90% of the first USD 761 of the AIME, plus 32% of the amount between USD 761 and USD 4 586, plus 15% for any amount in excess of USD 4 586 up to the earnings ceiling.⁵ The spouse of an eligible worker can also claim "spouse's insurance benefits" if the benefits s/he is entitled to are less than half those of the eligible worker.⁶

12. In both countries, the full retirement age (*i.e.* the age at which individuals can claim unreduced social security benefits) will rise gradually to 67 depending on the individuals' year of birth. Early

3. Moreover, replacement rates in the OECD publication *Pensions at a Glance* already provide a good approximation of how much workers joining the labour market today at age 20 and contributing until the normal retirement age would get at retirement relative to final salary given current pension laws.

4. The average income and the pension point value differ whether the individual lives in East and West Germany.

5. The maximum level of earnings for each of the best 35 years used to compute the AIME is currently USD 106 800.

6. The spouse's insurance benefits then equal to one-half of the benefits of the eligible worker.

retirement is allowed as of 62 in the United States. In Germany, women born before 1952, public sector employees and individuals with long careers can also claim social security benefits before their full retirement age (at age 60 for women, at age 63 otherwise). In case of early retirement, there is a reduction in pensions amounting to 0.3% per month in Germany and 5/9 of one percent per month in the United States.⁷ In Germany, social security benefits can also be increased in case of deferred retirement, after the full retirement age, by 0.5% per month.

13. Apart from the social security pension system, individuals can accumulate pension rights in private or funded pension arrangements in both countries. Employer-sponsored pension plans in Germany and the United States can offer two different types of DB plans: traditional DB plans and cash balance plans. In traditional DB plans, the benefits are linked through a formula to the member's wages or salaries, length of employment, or other factors. In cash balance plans, the benefits depend on a rate of return credited to contributions, where this rate of return is specified in the plan's rules. Moreover, in the United States employer-sponsored pension plans can also offer DC plans, including 401(k) plans, and mixed plans. Mixed plans are plans having two separate DB and DC components that are treated as part of the same plan.

14. Individuals can also have personal pension arrangements, which are DC in nature. In Germany anyone covered by the social insurance system can have a *Riester* plan and qualify for state subsidies. To receive full state subsidies (EUR 154 for single persons and EUR 308 for married couples), members of *Riester* pension plans must contribute at least 4% of their previous year's income. A state supplement of EUR 300 for every child born after 2007 can also be paid annually.⁸ The most common personal DC pension plan in the United States is the Individual Retirement Accounts (IRAs).

15. Both countries also provide safety-net retirement benefits to protect low income individuals from poverty in retirement. In 2008, the minimum pension was EUR 8 424 in Germany and USD 7 644 in the United States.

Assumptions used in the model

16. The study uses the rules currently in force in each country to project future income from social security, DB and DC pension plans. Some of the features described above however need to be adjusted according to data availability in the surveys used. In addition, assumptions are also needed as to individuals' career and asset accumulation from the time of survey until retirement. Some of these assumptions differ for older workers and prime age workers.

Adjustments linked to the data available

17. In the United States, individuals need to work at least 40 quarters during their career to be eligible to social security benefits. As the PSID does not provide the labour force status by quarter, but only by year, the study assumes that all individuals with at least 10 years of gainful employment are eligible. In addition, in order to select the best 35 years of earnings to calculate the AIME, the study uses the longitudinal feature of the PSID and retrieves individuals' past earnings. However, because of attrition problems, retrieving individuals' past earnings for their full career restrains too much the sample size, in particular for older workers for whom the number of years to retrieve may be large. Moreover, it is usually accepted that the best 35 years of earnings are usually the last ones, as most individuals have a growing

7. In the United States, if the individual retires more than 36 months before his/her full retirement age, benefits are reduced by 5/12 of one percent for each month of reduction in excess of 36 months.

8. The state supplement is of EUR 185 for every child born before 2008.

wage profile, at least at the beginning of their career. Therefore, the study calculates indexed earnings for the last 35 years of individuals' career, instead of the best 35 years.⁹

18. In the German SAVE survey, information about occupational and personal pension plans' coverage is only available at the level of the household, not at the level of the individual. The study therefore assumes that, in case of a couple, the plan holder is the prime wage earner.¹⁰ Additionally, for households covered by occupational pension plans, the survey does not provide the distinction between traditional DB plans and cash balance plans. However, households have the possibility to provide the level of assets in their occupational pension plan, which can actually be provided only for cash balance plans. The study therefore assumes that households that provided the level of assets in their occupational pension plan have a cash balance plan, while households that did not provide this information have a traditional DB plan. Finally, the number of years the household has been covered by an occupational plan is not available. It is assumed that the DB plan holder has been in that plan since the start of his/her career.

19. For the United States, the PSID provides information about DB, DC and "hybrid" plans. However, cash balance plans and mixed plans cannot be distinguished within this "hybrid" category. The study assumes that all hybrid plans are cash balance plans.

Assumptions related to future individuals' careers and private pensions' coverage

20. In order to determine the future pension income of current workers, assumptions related to the employment status of the individuals from the time of the survey until retirement need to be made. For the baseline scenario, the report assumes that individuals keep the employment status they had at the time of the survey until retirement. Therefore, individuals employed at the time of the survey will keep working, while individuals unemployed or out of the labour force will stay so until retirement. In the sensitivity analysis, the report looks at a more optimistic scenario where most non-working individuals go back to work. This is described in Section 4. For the remaining of the report, the cohort of individuals aged 55 to 64¹¹ is denominated "older workers" and the cohort of individuals aged between 35 and 54 is denominated "prime age workers" even though some of the individuals are actually not working.

21. The second important assumption is related to the age at which individuals retire. The analysis considers that the retirement decision is coordinated within households and is based on the decision of the prime wage earner. The assumption is that single individuals and the prime wage earner in a couple retire at their full retirement age, while the partner retires at the same time, whether or not s/he has reached or exceeded his/her full retirement age, under the condition that s/he can already claim social security benefits. If the partner cannot claim social security benefits yet when the prime wage earner retires, the study assumes s/he retires as soon as early retirement is possible. Section 4 relaxes this assumption and looks at the impact of early retirement on the pension income of future retirees.

22. The third main assumption concerns the future evolution of private pensions' coverage. The analysis assumes the *status quo* as regards private pension coverage in the baseline scenario. Individuals not covered by a private pension plan at the time of the survey are assumed to stay so until retirement (and

9. The sample selected for the analysis only includes households where it is possible to retrieve the best 35 years of earnings for the prime wage earner.

10. If the household owns more than one plan, it is assumed that each spouse is the holder of at least one of them.

11. The sample also includes individuals aged 65 and older, if they are living with a spouse younger than 65. The assumptions used for individuals between 55 and 64 years old also apply for individuals older than 64.

vice-versa). Section 4 looks at a more optimistic scenario where the private pension system expands as to cover all workers.

23. The promised benefit level for individuals covered by traditional DB plans is supposed to be equal to the product between the total number of years the individual has been in the plan, the plan's accrual rate and the last wage of the individual. The typical accrual rate for both German and American DB plans is assumed to be 1.5%. For the United States, the amount currently received or which is expected from DB plans offered on past jobs is also taken into account.

24. For individuals covered by cash balance plans or DC plans, the estimated level of assets just before retirement is determined by adding future contributions until retirement to the level of assets in the plan at the time of the survey, assuming an average annual real rate of return of 3%. Future contribution levels are determined by calculating the combined employer-employee contribution rate¹² at the time of the survey and assuming it stays constant until retirement. If members of *Riester* pension plans qualify for state subsidies, these are also added to the contributions.¹³ The estimated level of assets accumulated at retirement is then transformed into a stream of income by estimating the pension payment of a life annuity priced using the annuity premium formula, based on current life expectancy tables by age and gender for each country and a fixed real discount rate of 2%. Benefits received or expected from plans offered on past jobs are also taken into account in the case of the United States.

25. Finally, if the total pension income of the household, as calculated by summing up social security, DB, cash balance and DC pension for both partners, is below the safety-net benefit, it is assumed that the household will receive the safety-net benefit. The difference between the total pension income and the safety-net benefit is imputed to social security benefits.

3. Comparison of pension income for different cohorts

26. This section compares actual and projected pension income for three different cohorts (current retirees, older and prime age workers).¹⁴ For older and prime age workers the exercise complements actual household survey data with the assumptions discussed previously. The actual data comes from the 2009 PSID in the case of the United States and the 2010 SAVE in the case of Germany. For current retirees the exercise uses actual household survey data.

27. To compare the projected pension income of individuals retiring in different years in the future there is a need to express them in present values (2009 for the United States and 2010 for Germany). This is achieved by calculating projected pension income for current workers assuming no inflation and no productivity for wages.¹⁵ Moreover, in order to allow for a more consistent comparison of different cohorts of individuals, the actual pension income of current retirees and the projected pension income of current

12. Defined as the total level of contributions paid in the plan divided by the wage of the individual

13. The child subsidy stops being paid as soon as the mother reaches age 53 (assuming that on average a woman gives birth at 35 years old, her child will be an adult when she reaches age 53).

14. Households where the prime wage earner is younger than 55 are classified in the cohort "prime age workers". Households where the prime wage earner is aged 55 and older are classified in the cohort "older workers".

15. An alternative assumption would have been to allow earnings to change according to inflation and productivity. However, there is then a need to find a relative measure to compare pension income for different cohorts of retirees. The natural relative measure is the replacement rate, but this cannot be calculated for the current retirees (in particular for those who retired many years ago).

workers have been calculated using the 2009 PSID for the United States. Unfortunately, for Germany, two different sources have to be used for current retirees and current workers.¹⁶

28. Household composition needs to be taken into account when analysing individuals' income. For instance, a woman that has never worked may receive very little from the social security system but may not be in a difficult financial situation if she is married with a man who receives social security benefits based on a full career with a high level of earnings. The study therefore considers the equivalised household income using the OECD-modified equivalence scale to better compare income of individuals in households of different sizes.¹⁷

29. Total pension income is higher on average for individuals that just retired than for the overall cohort of retirees (see Table 1). Two different cohorts of current retirees can be considered for the analysis: the overall cohort of retirees, which mixes individuals of very different ages who retired recently or many years ago, and the cohort of those who just retired, which represents a more homogenous group in terms of labour histories. In both countries, individuals that just retired receive more on average from social security pensions than the average of all retirees. This may be due to the fact that new retirees have generally longer careers than old retirees. The pensions of new retirees also enjoy recent productivity gains, while the pensions of older retirees are only adjusted to inflation. The percentile distribution shows however that only new retirees in the second half of the distribution have more income than the overall cohort of retirees and that new retirees with low income are actually worse off than low income retirees in general. In addition, both cohorts of current retirees have a similar income composition. For instance, social security income represents 94.4% of the pension income of new retirees in Germany, as compared to 92.3% for the overall cohort of retirees, thus a difference of 2.1 percentage points. The difference between both cohorts is even smaller in the case of the United States (0.2 percentage point). Therefore, when comparing current retirees with future cohorts of retirees in terms of income composition in the following of the report, only the overall cohort of retirees is considered.

30. In both countries, total pension income may be higher for future retirees than for current retirees (see Table 1). Both the average and the median pension income may be higher for prime age and older workers than for current retirees. In the case of the United States, the difference in average pension income between older workers and new retirees may be as much as 40%.

Table 1. Distribution of actual and projected annual pension income by cohorts

		Average	Percentile distribution						
			5	10	25	50	75	90	95
Germany (in EUR)	Current retirees	16 847	7 920	9 516	12 552	15 704	20 224	28 524	36 800
	Just retired	17 323	6 000	8 400	12 000	15 600	20 800	27 848	36 868
	Older workers	18 570	8 424	8 424	10 898	17 011	23 950	39 970	50 063
	Prime age workers	23 495	8 424	8 824	14 565	21 052	29 813	42 722	51 776
United States (in USD)	Current retirees	25 282	4 968	7 200	11 800	17 752	28 080	39 996	57 680
	Just retired	26 858	4 428	6 000	9 750	17 250	35 847	44 533	62 000
	Older workers	37 649	7 644	10 249	17 265	28 463	46 806	71 058	100 051
	Prime age workers	37 795	7 644	7 644	14 876	28 060	49 823	78 237	99 745

Source: OECD calculations using the 2010 SAVE survey (for older and prime age workers) and the 2009 GSOEP (for current retirees and just retired) for Germany and the 2009 PSID for the United States.

16. The SAVE is used to project future pension income of current workers in 2010 values, while the GSOEP is used to calculate the actual pension income of current retirees, as of 2009.

17. See Hagenaars, A., K. de Vos and M.A. Zaidi (1994), *Poverty Statistics in the Late 1980s: Research Based on Micro-data*, Office for Official Publications of the European Communities. Luxembourg.

31. The most probable factor driving this result is the longer career assumed for future retirees as compared to current ones. Partial evidence only can support that assertion as career length cannot be easily calculated for current retirees. For instance, people retiring later may have longer careers. The assumptions made for the age of retirement actually lead to higher average effective retirement age for future cohorts of retirees than what is currently observed in both countries. The average effective retirement age in the United States is currently 65.5 for men and 64.8 for women, while in Germany it is 61.8 for men and 60.5 for women.¹⁸ As the model assumes that most individuals would retire at their full retirement age, this results in higher effective retirement ages for future cohorts of retirees. In the case of Germany for instance, older workers would retire on average at 65.4 years old (65.7 for men and 65.1 for women) and prime age workers would retire even later on average at 66.8 years old (67.3 for men and 66.5 for women). Delayed exits from the labour force for future retirees may translate into longer career and therefore into higher pension rights accumulated in social security, occupational and personal pension plans as compared to current retirees. In addition, as people exiting the labour market later lives less years in retirement, life annuity payments derived from DC pension plans would also be higher for future retirees.

32. Partial evidence from longer careers for future retirees also comes from the fact that individuals close to retirement have shorter careers on average than the overall cohort of current workers. In the case of the United States for instance, the average length of career that current workers may have at retirement is 28.5 years.¹⁹ However, when focusing on workers retiring the year following the survey, for which the career is actual and not projected, the average length of career falls to 25.5 years. These individuals may be partially representative of individuals that just retired and have shorter careers than the overall cohort of future retirees.

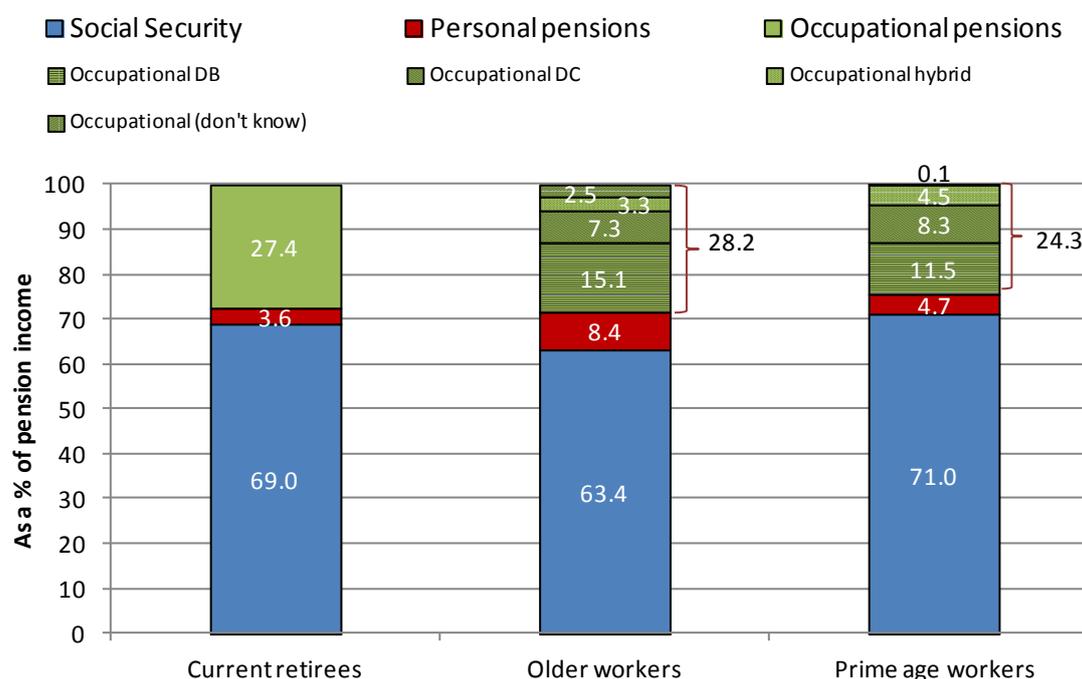
33. Prime age and older workers may have similar average total pension income to finance retirement in the case of the United States, but low income individuals may be worse off in the cohort of prime age workers. The average total pension income is indeed very close for both cohorts (USD 37 649 for older workers as compared to USD 37 795 for prime age workers, see Table 1). However, pension income at the 10th percentile²⁰ is lower for prime age workers than for older workers, showing that low income individuals may be worse off in the cohort of prime age workers than in the cohort of older workers. This is confirmed by the fact that more individuals may benefit from safety-net retirement benefits in the cohort of prime age workers (9.8%) than in the cohort of older workers (5.3%).

34. In addition, both cohorts of future retirees may have different income composition (see Figure 1). Indeed, prime age workers may rely more on social security pensions and less on occupational and personal pensions than older workers. While both cohorts of workers may have a similar length of career on average (28.5 years), prime age workers may enjoy higher average real wages (USD 55 344) than older workers (USD 52 855). This explains why the former may have higher social security pensions on average (see Table 1). In addition, the coverage rate of prime age workers by private pension plans is lower than for older workers (56.8% and 73.7% respectively). Therefore, as the model assumes the *status quo* in terms of private pension coverage (individuals not covered by any private pension plan at the time of the survey are assumed to stay so until retirement), income coming from occupational and personal pension plans may be less important on average and as a share of total pension income for prime age workers than for older workers.

18. Source: OECD Pensions at a Glance 2011.

19. Only the last 35 years of the career are taken into account for the United States, not the full career.

20. This corresponds to the pension income so that 10% of the population have less than that amount.

Figure 1. Composition of pension income by sources and cohorts in the United States

Note: Occupational pensions for older and prime age workers are broken down by type: DB, DC, Hybrid and don't know. Don't know means that people report an occupational pension plan but are unable to distinguish whether it is a DB, DC or hybrid plan.
Source: OECD calculations using the 2009 PSID.

35. The situation may be different in the case of Germany, where prime age workers may have higher total pension income on average than older workers, while both cohorts may have comparable income composition. For each percentile of the distribution of pension income, prime age workers may indeed have more income than older workers. In particular, prime age workers may get higher social security pensions as they enjoy higher average real wages (EUR 35 040 for prime age workers as compared to EUR 32 359 for older workers) and may have longer careers (40.8 years as opposed to 39.2 years). In addition, safety-net benefits may be more needed for older workers (18.5% of the households in that cohort may receive such benefits) than for prime age workers (9.0% of the households in that cohort may receive such benefits). Moreover, the coverage rate of households by private pension plans is higher for the cohort of prime age workers (60.1%) than for the cohort of older workers (45.4%). This explains why younger generations of workers may rely more on private pension sources than old generations (see Figure 2). However, the difference in the income composition between the two cohorts remains small (less than 2 percentage points difference between the two cohorts for the share of social security income in total pension income for instance).

36. Another important message that can be drawn from the analysis is that social security pensions are the main source to finance retirement and may continue being so in the future in both countries. Social security income may indeed represent between 63% and 92% of total pension income depending on the cohort and the country (see Figures 1 and 2).

Figure 2. Composition of pension income by sources and cohorts in Germany



Note: Occupational pensions for older and prime age workers are broken down by type: DB and Hybrid.
 Source: OECD calculations using the 2010 SAVE survey (for older and prime age workers) and the 2009 GSOEP (for current retirees).

37. The pension income of any cohort of retirees varies according to gender. Indeed, in both countries and for all cohorts, women have or may have less income to finance retirement than men.²¹ The gap between men and women may even increase in the future, as women of prime age may have 27.8% less pension income than men in the case of the United States, as compared to 22.7% less for women older than 55 and 18.5% less for women currently retired. This result is mainly driven by the difference in real wages between men and women (for instance, the average wage is USD 73 062 for men and USD 39 300 for women in the cohort of prime age workers).

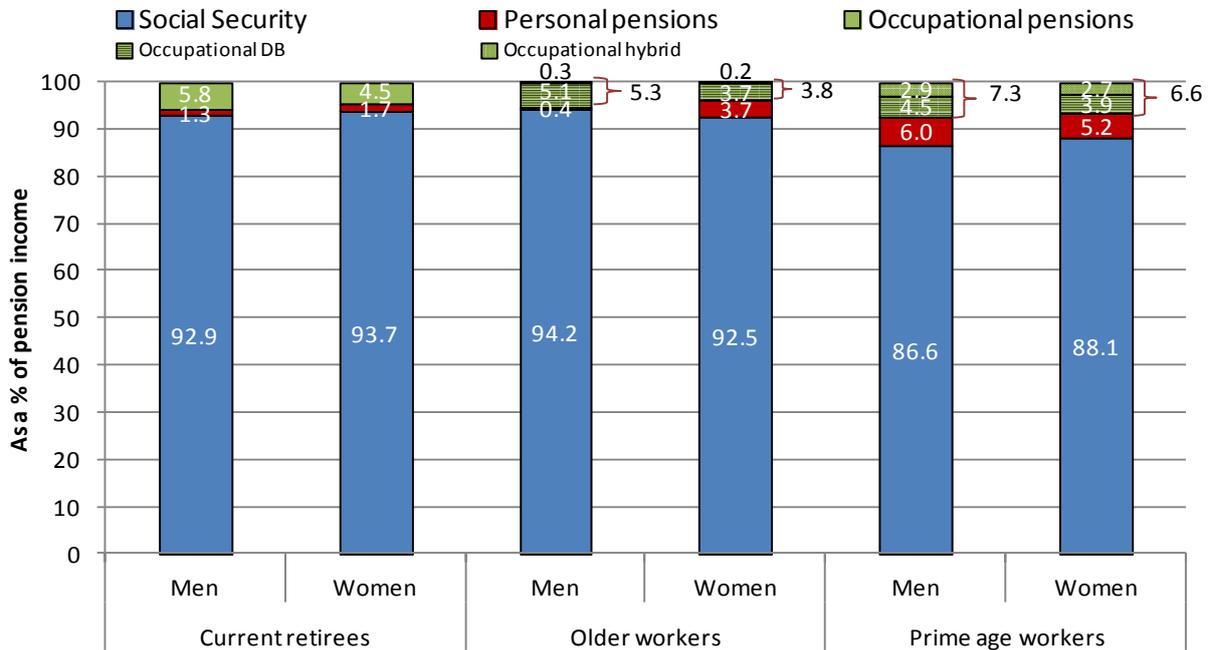
38. In addition, social security benefits in general may represent a larger share of pension income for women than for men (see Figures 3 and 4). One possible explanation is that women are usually less often covered by private pensions than men.²² Moreover, as compared to men, women older than 55 may have a higher share of their pension income coming from personal pensions in both countries. In the case of Germany however, the small sample size for single older workers may overestimate the difference between men and women in that respect (3.7% of the total pension income is coming from personal pensions for women as opposed to 0.4% for men).²³

21 . Individuals living in couples have the same equivalised pension income. Therefore, the analysis of pension income by gender is done for single households only.

22 . Women are more likely to be in part-time jobs and tend to suffer more unemployment than men. Part-time jobs are less likely to offer private pensions. See Antolin P. (2008), "Coverage of funded pension plans", OECD Working Papers on Insurance and Private Pensions, No. 19, OECD, Paris.

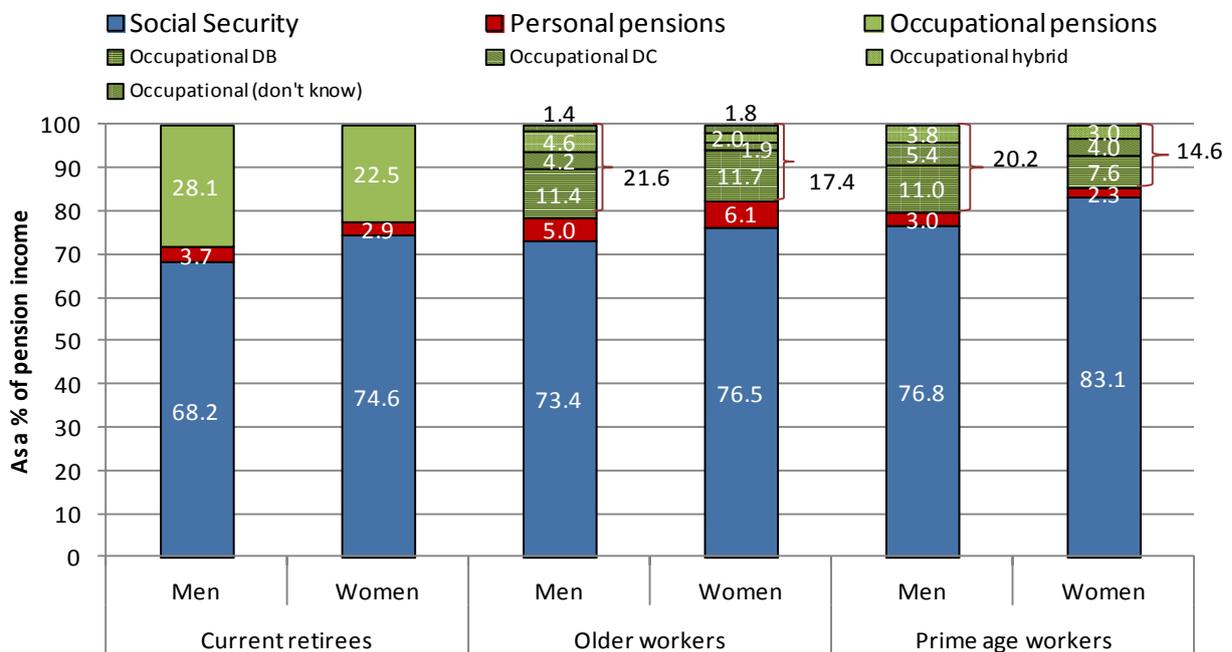
23 . There are only 68 single households where the individual is older than 55 (24 men and 44 women) in the sample for Germany. Of those, 13 hold a *Riester* plan, of which 12 are women. The share of pension income coming from personal pensions for women may therefore be overestimated. This would explain

Figure 3. Composition of pension income by sources, gender and cohorts in Germany



Note: Occupational pensions for older and prime age workers are broken down by type: DB and Hybrid.
 Source: OECD calculations using the 2010 SAVE survey (for older and prime age workers) and the 2009 GSOEP (for current retirees).

Figure 4. Composition of pension income by sources, gender and cohorts in the United States

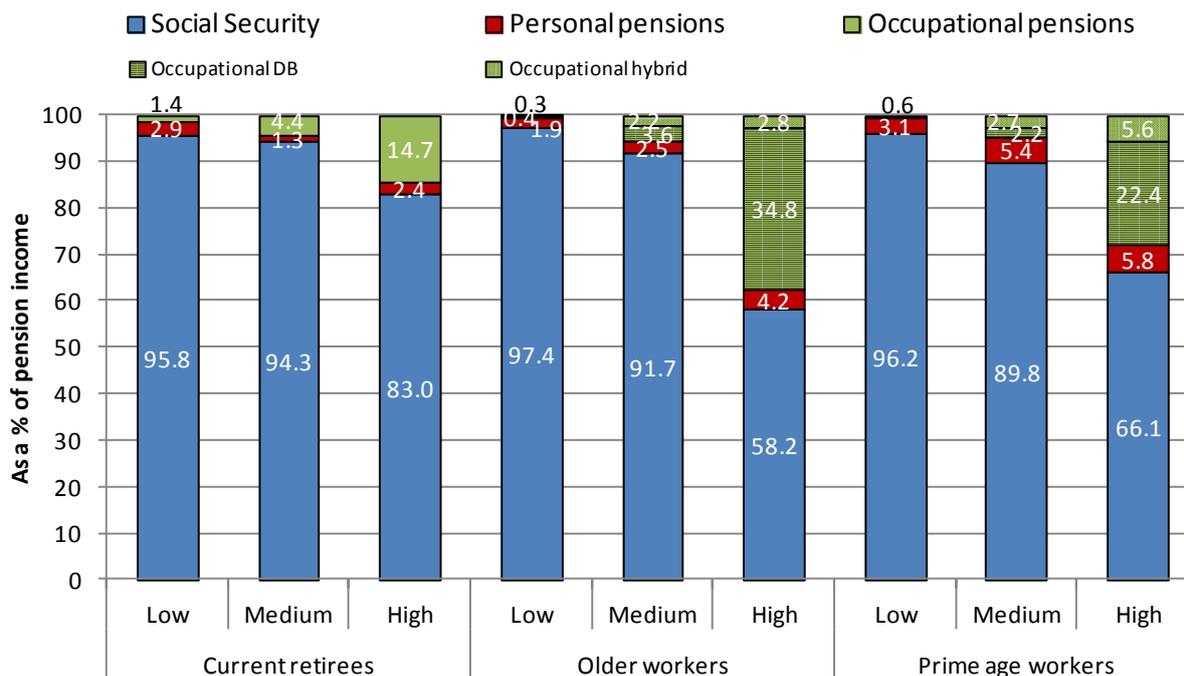


Note: Occupational pensions for older and prime age workers are broken down by type: DB, DC, Hybrid and don't know. Don't know means that people report an occupational pension plan but are unable to distinguish whether it is a DB, DC or hybrid plan.
 Source: OECD calculations using the 2009 PSID.

why the share of pension income coming from social security pensions for women in this cohort is not higher than for men.

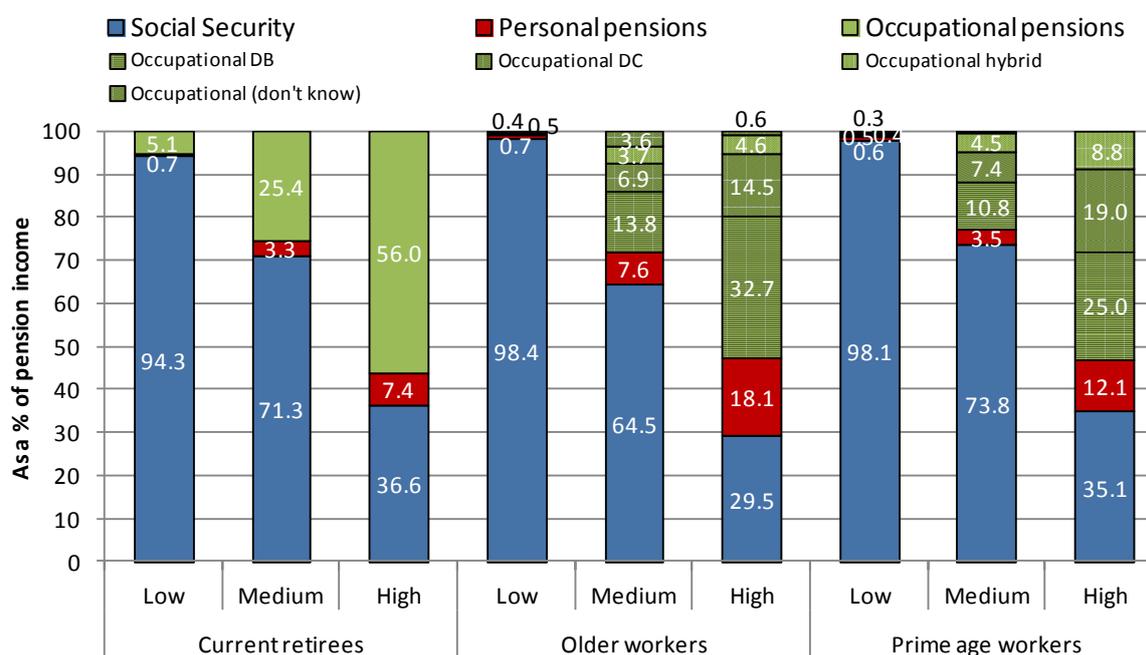
39. The composition of pension sources to finance retirement also changes according to the income level. Thus, social security pensions decrease in importance with the income of the individual (see Figures 5 and 6). Despite this decrease, they may remain the main source of pension income for all individuals in Germany, even for high income individuals. In the United States, occupational pensions may continue representing the main source of pension income for high income individuals. In both countries, the share of occupational and personal pensions in total pension income may also increase with the income level of the individual in each cohort. The OECD work on coverage, which shows that coverage rates of private pension plans increase with income levels may help in explaining this.²⁴

Figure 5. Composition of pension income by sources, income group and cohort in Germany



Note: Occupational pensions for older and prime age workers are broken down by type: DB and Hybrid.
 Source: OECD calculations using the 2010 SAVE survey (for older and prime age workers) and the 2009 GSOEP (for current retirees).

24. See Antolin (2008).

Figure 6. Composition of pension income by sources, income group and cohort in the United States

Note: Occupational pensions for older and prime age workers are broken down by type: DB, DC, Hybrid and don't know. Don't know means that people report an occupational pension plan but are unable to distinguish whether it is a DB, DC or hybrid plan.
Source: OECD calculations using the 2009 PSID.

4. Sensitivity analyses

40. This section presents different sensitivity analyses, which show the impact of the following factors on the results: the employment status, the coverage rate of private pension plans, the age of retirement and the market returns.

41. More specifically, a more optimistic scenario is considered as regards the employment rate. Most of the individuals who were not working at the time of the survey are now assumed to go back to employment the year after, with the same level of earnings as in their previous employment experience. In particular, all unemployed individuals at the time of the survey are assumed to find a job and to keep it until retirement. In addition, individuals younger than 55 who were out of the labour force at the time of the survey are assumed to go back to employment if they had already worked in the past. Individuals who were out of the labour force, and either aged 55 and older or had never worked in the past, stay out of the labour force until retirement. This assumption therefore increases the employment rate as compared to the baseline scenario.

42. Considering the trend observed in many countries of a switch from DB to DC pension plans, and the fact that younger individuals tend to be less often covered by a private pension plan than their elders,²⁵ prime age workers with no private pension plan coverage at the time of the survey are now assumed to be covered in the future by a DC pension plan (as of the following year until the day they retire).²⁶ For Germany, the analysis considers that all non-covered prime age workers will have a *Riester* pension plan

25. OECD studies on the coverage of private pensions (e.g. Antolin, 2008; and the on-going report on coverage for the European Commission) show that the coverage of private pensions increases with age.

26. This assumption does not apply for individuals who are assumed to stay out of the labour force until retirement. As they are not working, they are not eligible for private pension coverage.

and contribute 4% of their wages, which is the minimum contribution rate to get the state subsidies. For the United States, it considers that all non-covered prime age workers will have a 401(k) plan, with a combined employer-employee contribution rate of 10%.²⁷ This assumption only concerns the cohort of prime age workers.

43. Instead of assuming that individuals retire at their full retirement age, they are now assumed to retire as early as possible, at age 62 in the case of the United States, at age 60 or 63 depending on the individuals in the case of Germany. This also partially addresses the fact that the model assumes a longer length of career for current workers as compared to current retirees.

44. Finally, the sensitivity analysis looks at the impact of the average annual real rate of return on the results. It is assumed to double, from 3% in the baseline scenario to 6% in the sensitivity analysis.²⁸

45. Early retirement is the factor having the biggest impact on the average projected pension income in both countries (see Table 2). The age of retirement may not significantly change however the income composition by sources. When assuming early retirement, the average effective retirement age drops from 65.4 to 63.8 for older workers and from 66.8 to 64.4 for prime age workers in Germany. This results in closer but still higher effective retirement ages than what is currently observed for men (61.8) and women (60.5). The drop is even larger for the United States: from 65.5 to 62.7 for older workers and from 66.8 to 62.3 for prime age workers. This assumption leads to effective retirement ages which are lower than what is currently observed for men (65.5) and women (64.8). As a consequence, older workers in Germany may lose on average 8.8% of their total pension income if they retire early, when prime age workers may lose 10.0%. The lost would be larger in the United States: 18.7% and 23.0% respectively for old age and prime age workers. In addition, the difference in total pension income between older workers and new retirees would then drop from 40% to 14%. In terms of income composition however, early retirement does not seem to modify much the relative importance of social security, occupational and personal pensions in total pension income (see Figures 7 and 8).

Table 2. Average projected annual pension income by cohorts, assumptions and sources (baseline=100)

Cohort	Assumption	Germany				United States			
		Total	Social Security	Occupational pensions	Personal pensions	Total	Social Security	Occupational pensions	Personal pensions
Older workers	Baseline	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0
	Higher employment rate	101.2	101.0	102.0	101.2	100.3	100.6	100.0	100.0
	Early retirement	93.2	94.0	92.2	79.8	81.3	78.6	86.1	76.0
	Higher returns	101.0	100.0	102.3	122.8	106.1	100.0	109.3	118.0
Prime age workers	Baseline	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0
	Higher employment rate	102.3	102.5	101.4	101.6	101.4	102.8	100.0	100.0
	Higher coverage	103.8	99.9	100.0	173.7	113.9	99.9	135.3	100.0
	Early retirement	90.0	91.2	88.6	76.1	77.0	73.3	81.4	79.1
	Higher returns	104.9	100.0	111.7	157.9	118.2	100.0	131.4	165.8

Note: The results under the baseline scenario take the value 100. The values for the other assumptions represent the relative difference with the baseline.

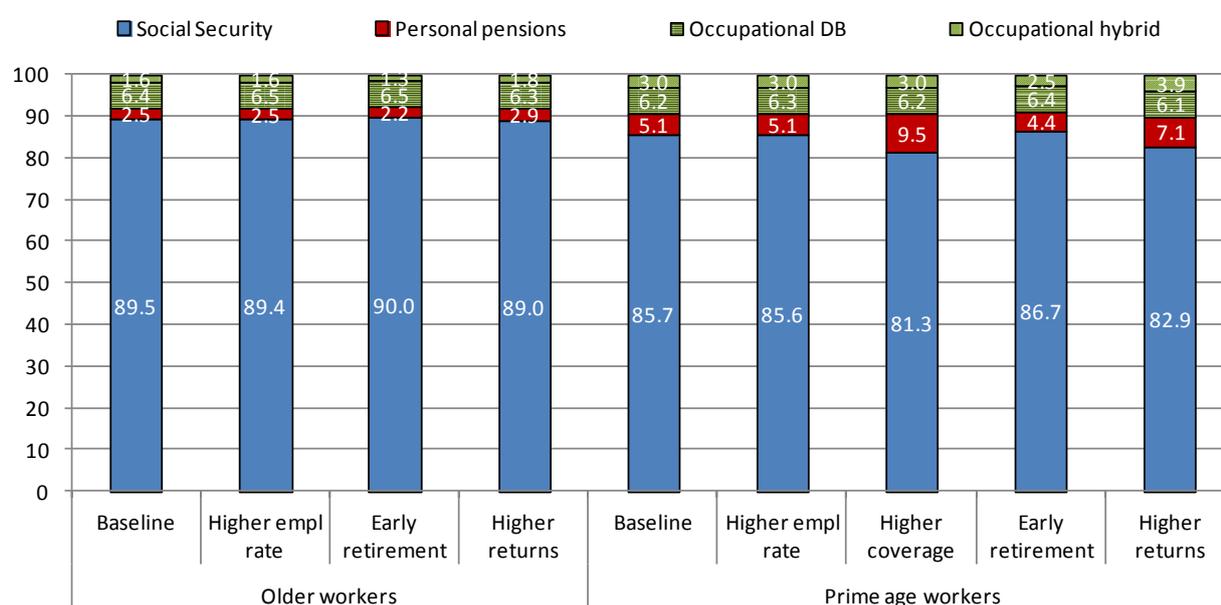
Source: OECD calculations using the 2010 SAVE survey for Germany and the 2009 PSID for the United States.

27. This estimated contribution rate has been calculated as the average contribution rate for individuals currently having a DC pension plan. The breakdown by age and income revealed that the average of 10% apply for all age and income groups.

28. A 6% average annual real rate of return is plausible, as historical data over the last 40 years (ending in 2010) for the United States show that a portfolio composed of 60% equities and 40% government bonds would have given an average nominal rate of return of 9%. Additionally, assuming a higher rate of return without modifying the value for the discount rate implies a higher equity premium (4 percentage points in this case). Historical data for the United States and Germany over the last 100 years show an average equity premium in the range 5-6 percentage points.

46. Market returns may also have an important impact on the level and on the composition of pension income of future retirees. In both countries, this impact may be more important for prime age workers than for older workers, as the former have a longer time horizon to enjoy higher returns on their portfolio. Increasing average real returns from 3% to 6% may thus translate into a 4.9% increase in the total pension income of prime age workers in the case of Germany, as compared to 18.2% in the case of the United States (see Table 2). As only private pension sources are sensitive to market returns, an increase in the average real rate of return may also modify the income composition by increasing the share of occupational and personal pensions in total pension income and decreasing the importance of social security pensions. In the case of the United States for instance, the share of social security pensions in the total pension income of prime age workers may decrease by 4 percentage points (from 71.0% to 67.0%) if average real returns double from 3% to 6% (see Figure 8).

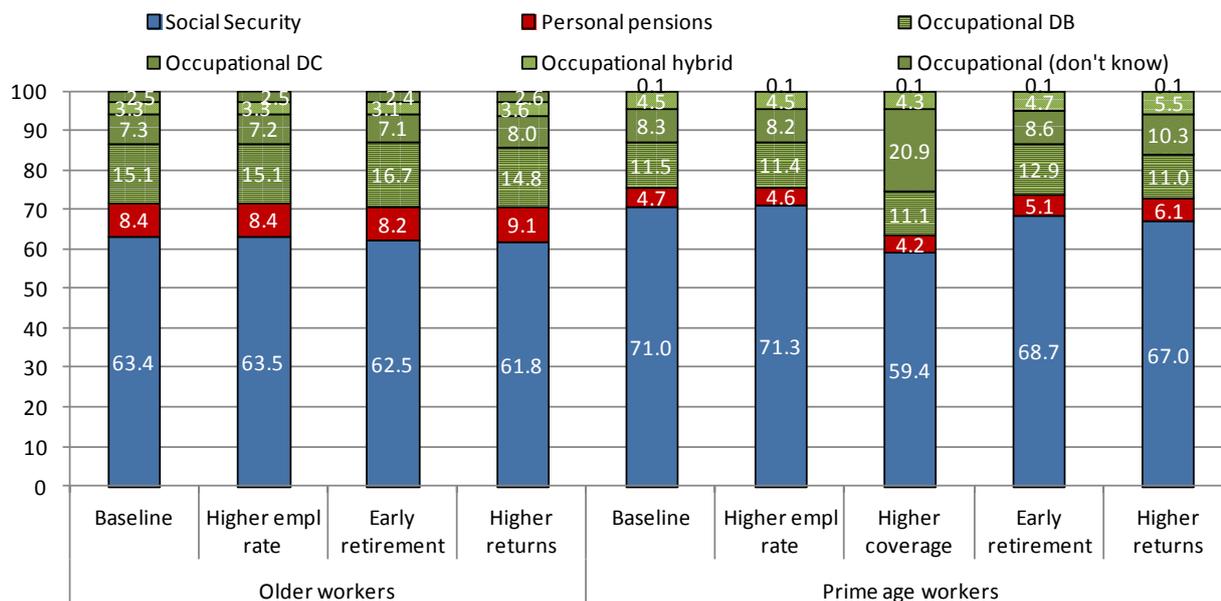
Figure 7. Composition of pension income by sources, cohorts and assumptions in Germany



Source: OECD calculations using the 2010 SAVE survey.

47. If the private pension system was to expand in the future, so as to cover all workers, the total pension income of future retirees would increase and they would rely more on private pension sources than otherwise. In the case of Germany for instance, the coverage rate of households by *Riester* plans would increase from 46.6% to 79.3% within the cohort of prime age workers if *Riester* plans expanded to all workers having no private pension coverage. The income from personal plans would then increase by 73.7%, leading to an increase in the total pension income of 3.8% as compared to the *status quo* situation where individuals not covered by a private pension plan at the time of the survey stay so until retirement (see Table 2). The increase may be even more important in the case of the United States, where the total pension income may increase by 13.9% if 401(k) plans expanded to all workers having no private pension coverage (the coverage rate of 401(k) plans would in that case increase from 20.0% to 59.% among prime age workers).

Figure 8. Composition of pension income by sources, cohorts and assumptions in the United States



Note: Don't know means that people report an occupational pension plan but are unable to distinguish whether it is a DB, DC or hybrid plan.

Source: OECD calculations using the 2009 PSID.

48. Finally, while increasing the number of people in employment, the employment rate, may increase the sources to finance retirement of those people gaining employment, it may not have a large impact on total average pension income and income composition. Increasing the employment rate mainly increases the proportion of individuals who will be in a position to claim social security benefits at retirement. However, it may not increase significantly the average pension income that each future retiree will receive. Moreover, it may have no impact either on the income composition by sources. Additionally, it is important to bear in mind that around 85% of prime age individuals are already in employment, and they are the one determining the total average pension income of its composition.

5. Conclusions

49. This report has been a first attempt at assessing how much in terms of pensions three different cohorts of individuals, current retirees, older workers (*i.e.*, aged 55 to 64) and prime age workers (*i.e.*, aged 35 to 54) have or may have to finance their retirement. After assessing the actual financial resources of current retirees, the report has estimated the amount of money that current workers may have when they retire. It has used the rules currently in force in each country to estimate income from social security, DB and DC pension plans. Survey data provided information on workers' past labour histories and on their current level of assets in DC pension plans. This actual information combined with assumptions as to individuals' career and asset accumulation from the time of survey until retirement has permitted to project the amount of resources to finance retirement. These assumptions relate to the age of retirement, the labour market status, the coverage rate of private pensions, accrual rates in DB plans, contribution rates in DC plans, market returns, and discount rates. Finally, it has assessed how these assumptions impact the distribution of pension sources to finance retirement for each cohort according to different socio-economic characteristics to conclude that the age of retirement is the most important one.

50. Delegates are invited to discuss the relevance of these assumptions, suggest changes and the underlying assumptions for an optimistic and a pessimistic scenario, as well as agree with the next steps of the project: phases 2 and 3 for Germany and the US, and extend the project to other countries.