

Partial retirement: effects on employment and implications for government budgets

By Peter Haan and Songül Tolan

The demographic change is posing many challenges for government budgets. In the face of a shrinking work force, keeping the number of workers and thus pension contributors at the highest possible level is a key economic policy goal. This could be achieved if people retire from the work force later in life. Partial retirement, the option to work part-time while drawing a pension before reaching the normal retirement age, could create the necessary conditions for reaching this goal. The impact of partial retirement on employment will be simulated below. The results show that unrestricted access to partial retirement can lead to an increase in employment volume and generate positive fiscal effects. The effects on employment are especially positive when the entry age for partial retirement coincides with the early retirement age of 63. Flexible retirement, which came into effect in 2017, allows people to receive a partial pension payout before the normal retirement age while still working. However, the computation behind the amount of pension payouts during flexible retirement is very complex. In addition, the limit to pension payouts in flexible retirement could be considered too strict. This negatively affects the attractiveness of the flexible retirement option. Furthermore, work hours can only be reduced in the case of flexible retirement if the employer agrees. If an evaluation of flexible retirement shows that few people make use of it, policymakers would have to simplify the rules regarding additional income and consider a statutory right to partial retirement before the normal retirement age, with possible exceptions for small businesses.

The demographic change poses a challenge for pension insurance systems. In particular, pay-as-you-go pension systems face the issue of more and more beneficiaries with ever fewer contributors due to an aging population.¹ To counteract this development, multiple reforms have been implemented in Germany since the 1990s which have raised the retirement age and reduced the possibilities of retiring early. These include the introduction of pension deductions for early retirement (1992), raising the early and statutory retirement ages for different population groups (1999, 2007), and creating stricter eligibility requirements for disability pensions (1999). The average retirement entry age since the end of the 1990s has risen from about 62 to 64 as a result of these reforms, among other things.²

Increasing the flexibility of the retirement transition can raise the average retirement age

Increasing rigid age limits is problematic if certain parts of the population fail to extend their employment accordingly. An additional option for changing the retirement age is to increase the flexibility of the retirement transition before the normal retirement age. The advantage of increasing the flexibility is the compatibility of a high degree of individuality in making decisions about retirement and incentives for retiring later in life. People can use this flexibility to adjust their retirement decision to their individual circumstances. There are many different ways to increase the flexibility of the retirement entry age.³

¹ Between 1992 and 2014 alone, the share of the German population over 64 increased from 15.3 to 21.5 percent, one of the highest proportions in the OECD comparison. Cf. OECD (2017): Labour force statistics (available online).

² German Statutory Pension Insurance Scheme (2016): Rentenversicherung in Zeitreihen, pg. 138 (in German) (available online).

³ Models for a flexible retirement transition differ in many aspects, such as eligibility prerequisites, financing, entry age, amount and timing of pension payments, specified working hours, and whether they are organized or supported by the state.

One variant of this increased flexibility is partial retirement.⁴ Partial retirement allows for a reduction in working hours in combination with partial pension payouts before fully retiring. The partial retirement discussed in this week's Economic Bulletin is a stylized partial retirement scheme based on Dutch occupational partial retirement schemes. In this type of partial retirement, a person works 50 percent of a full-time position. Their income is a combination of their part-time wages and partial pension payout.⁵ The part-time wages equal exactly half of the equivalent full-time salary minus the corresponding taxes and social security contributions. The pension share of partial retirement income is equal to half of the equivalent full pension at the time of entry into partial retirement, whereby there are pension deductions in the amount of 3.6 percent on pension payouts for every year people retire before the normal retirement age. During partial retirement, pension contributions continue according to part-time earnings. People in partial retirement receive the other 50 percent of their pension entitlements when they fully retire. Deductions on half the pension remain over the entire term of the pension payout.

To determine the effects of such a partial retirement scheme, an empirical analysis of retirement behavior is carried out. The simulation depicts the main elements of the German pension system and focuses on West German men born between 1940 and 1947 (Box).⁶

Flexible retirement,⁷ which came into effect in Germany in 2017, is similar to partial retirement in that the income from part-time employment is combined with a partial pension. Partial pension payouts as well as earned income can be drawn starting at the early retirement age⁸ of 63 in flexible retirement. Getting rid of rigid supplementary income limits such as those that were present in an

earlier partial retirement scheme⁹ may have increased the attractiveness of flexible retirement.¹⁰ However, in flexible retirement, there is still a reduction rate of 40 percent of the additional income after the deduction of the 6,300 euro yearly allowance on pension payouts.¹¹ Due to the complexity of this scheme and the high reduction rate, flexible retirement is somewhat less attractive in comparison to partial retirement, which is examined in this study.

Flexible retirement also facilitates working past the normal retirement age, but that expansion is not covered in this Economic Bulletin. Instead, the focus is on the time before reaching the normal retirement age.

Furthermore, there is another important difference between partial and flexible retirement. It is assumed that all people who qualify for early retirement have unrestricted access to partial retirement. However, flexible retirement does not guarantee an unconditional right to work part-time. One may apply to have their work hours reduced when employed at a company with at least 15 employees, but this request must first be approved by the employer. The right to apply for part-time work does not exist in companies with fewer than 15 employees.¹²

Policy simulations based on a structural model

The empirical analysis uses a dynamic structural model that reflects retirement decisions (Box). This model allows for an analysis of the employment effects of partial retirement as well as its impact on government budgets. The model is estimated on the basis of "Biographical data of select social insurance agencies in Germany" (*Biografiedaten ausgewählter Sozialversicherungsträger in Deutschland*, BASiD),¹³ a data set covering the birth cohorts 1940 to 1947. BASiD contains the necessary information regarding employment and earnings histories as well as pension entitlements.

Based on the estimated parameters of the structural model, two stylized forms of partial retirement are

4 The most widespread type of flexible transition into retirement in Germany is part-time work for elderly employees (*Altersteilzeit*, ATZ). The legal framework conditions are regulated by the German Partial Retirement Law (*Altersteilzeitgesetz*). Employees aged 55 years or older may apply for ATZ provided they meet the prerequisites. Access is governed by collective agreements or at the company level. Compensation payments of 20 percent and 40 percent of the corresponding full-time equivalent for wages and pension contributions, respectively, is paid. At the latest, the ATZ ends at the time of the normal retirement age. However, people in ATZ often use the block model variant, which in fact equals early retirement. Due to the cessation of financial support by the Federal Employment Agency on October 1, 2010, ATZ is in the process of being phased out (cf. also Bundesagentur für Arbeit (2015): *Arbeitsmarkt in Zahlen. Altersteilzeit nach dem Altersteilzeitgesetz* (in German, (available online)).

5 A different division between gainful employment and retirement pay would in principle also be possible.

6 Cf. Songül Tolan (2017): The effect of partial retirement on labor supply, public balances and the income distribution: Evidence from a structural analysis. DIW Discussion Paper 1679 (available online).

7 Cf. Federal law gazette 2016, part 1, 59.

8 This term refers to the earliest possible age limit for receiving an early retirement pension.

9 The flexible retirement scheme has a predecessor. It enabled a partial pension payout in the amount of one-third, one-half, and two-thirds of the full pension before reaching the normal retirement age. Individual supplementary income limits applied to each payout amount. Exceeding these limits by one cent caused a reduction to the next lower payout amount and corresponding reclaims.

10 Cf. Martin Gasche und Carla Krolage (2011): Gradual transition to retirement with flexible partial retirement. MEA Discussion Paper 243-2011 (in German) (available online).

11 If the amount of this combined income exceeds the best income of the last 15 years, the individual supplementary income cap will apply. Pension payouts in flexible retirement decrease by 100 percent of the excess amount.

12 Cf. *Teilzeit- und Befristungsgesetz* § 8 (in German) (available online).

13 Daniela Hochfellner, Dana Müller und Anja Wurdack (2012): Biographical data of social insurance agencies in Germany—improving the content of administrative data. *Schmollers Jahrbuch* 132(3), 443–451.

Box

Structural dynamic model of retirement decisions

An economic decision model is used for the empirical analysis.¹ The basic structure of the model goes back to Rust's dynamic decision model (1989),² which is widely used in economic retirement research. It reflects the choice between continuing to work full time and leaving the work force by one of three different retirement paths. These retirement paths are: (1) regular retirement (2) retirement after unemployment, and (3) retirement via partial retirement. The decisions are made under uncertainty. The mortality risk and the risk of involuntary unemployment are explicitly taken into account. The mortality risks are based on the mortality tables from the Federal Statistical Office (*Statistisches Bundesamt*, Destatis). The risk of unemployment is displayed with the help of a regression based on data from the Socio-Economic Panel (*Sozio-ökonomisches Panel*, SOEP).³ The data contain information about layoffs, business closures, and fixed-term contracts.

In addition, the model implements an approximation of the tax and transfer system as well as the rules and conditions of the underlying retirement system. In the absence of household and asset information in the data set, this model does not take

savings behavior into account.⁴ The model's age horizon ranges from 55 to 100 years, but decisions can only be made between 55 and 67 (the normal retirement age). It is assumed that everyone is in retirement at the normal retirement age.⁵ Partial retirement preference assumptions are based on individual decisions regarding part-time work for elderly employees (*Altersteilzeit*, ATZ), taking ATZ's specific institutional rules into account in the estimation process. The decision problem in the model is solved using the dynamic programming method⁶ and the parameters are estimated using the maximum likelihood method based on the BASiD record. Finally, the estimated parameters are used to simulate full access to partial retirement under different conditions.

The underlying data set is limited to West German men as the economically largest group of people with potential access to the considered retirement paths. The employment histories of women and East German persons in the birth cohorts studied show marked differences compared to the employment histories of West German men, which leads to significant differences in their behavior when entering into retirement.⁷ Due to the smaller sample of these groups in the underlying data set, a separate analysis of the groups included in this study is not possible.

¹ For an in-depth discussion of the specifications and estimation results, see Songül Tolan (2017).

² Cf. John P. Rust (1989): A dynamic programming model of retirement behavior. *The Economics of Aging*, NBER Chapters, 359–404. National Bureau of Economic Research.

³ SOEP is part of the DIW Berlin research infrastructure. The survey is carried out by Kantar Public. Cf. Gert G. Wagner et al. (2008): *Das Sozio-ökonomische Panel (SOEP). Multidisziplinäres Haushaltspanel und Kohortenstudie für Deutsche – Eine Einführung (für neue Datennutzer) mit einem Ausblick (für erfahrene Anwender)*. *AStA Wirtschafts- und Sozialstatistisches Archiv* 2(4), 301–328 (in German) (available online).

⁴ Cf. John Rust und Christopher Phelan (1997): How social security and medicare affect retirement behavior in a world of incomplete markets. *Econometrica* 65(4), 791–831 (available online).

⁵ This assumption is supported by the data. Less than 0.25 percent of this sample is employed after the normal retirement age.

⁶ Cf. John Rust (1987): Optimal replacement of GMC bus engines: An empirical model of Harold Zurcher. *Econometrica* 55(5), 999–1033.

⁷ Cf. Martin Huber, Michael Lechner und Conny Wunsch (2016): The effect of firms' phased retirement policies on the labor market outcomes of their employees. *ILR Review* 69(5), 1216–1248 (available online).

simulated and compared to a baseline scenario without a partial retirement option.

In the baseline scenario, people end their professional life either via a transitory phase of unemployment or by regular retirement starting from the early retirement age of 63 onwards for long-term insured. Deductions for drawing a pension before the normal retirement age apply as mentioned above. The normal retirement age is set at 67 in all scenarios.

The two hypothetical scenarios differ in regard to the entry age for partial retirement. In the first scenario, partial retirement can begin at 60, before the early retirement age (Scenario I). In the second scenario, partial

retirement is first possible starting at the early retirement age of 63 (Scenario II).

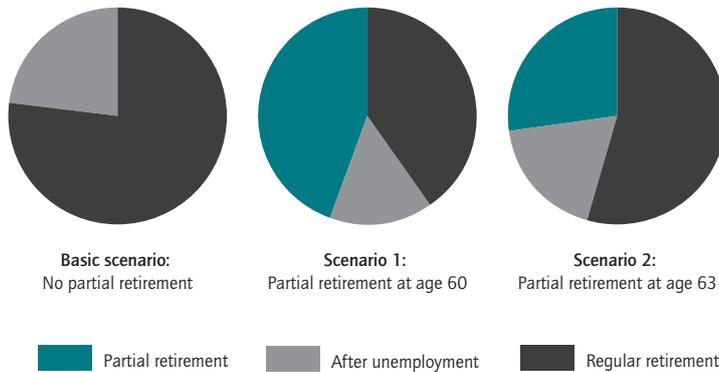
Flexible retirement does not always yield positive employment effects

It is often expected that a more flexible transition into retirement will increase the employment volume. However, positive effects on employment can only occur when the people who would have entered early retirement are motivated to remain in the work force longer due to the possibility of working part-time under partial retirement. Yet the effects on employment can also be negative, such as when the new partial retirement scheme creates incentives for potential full-time workers to enter

Figure 1

Retirement behavior

Percentage share of West German men in different retirement paths



Source: Author's own calculations.

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The share of people retiring regularly or via unemployment decreases with the implementation of partial retirement.

partial retirement early. The age when entering into partial retirement plays an important role in the effects on employment. The sooner the entry into partial retirement is possible and the longer people can spend partially retired, the more people will choose partial retirement instead of early retirement or full-time employment. If the entry age for partial retirement is too low, it can motivate people to switch from full-time employment to partial retirement earlier, which reduces the employment volume, or the total number of hours worked.

If the entry age is too high, people who actually would have opted for partial retirement leave the work force through alternative early retirement options. Thus, the entry age influences how many people would switch from alternative early retirement options as well as full-time employment to partial retirement if partial retirement were to be introduced. Since the first way positively affects employment and the second negatively, the overall effect of partial retirement on employment volume depends on the net effect of these counteracting effects.

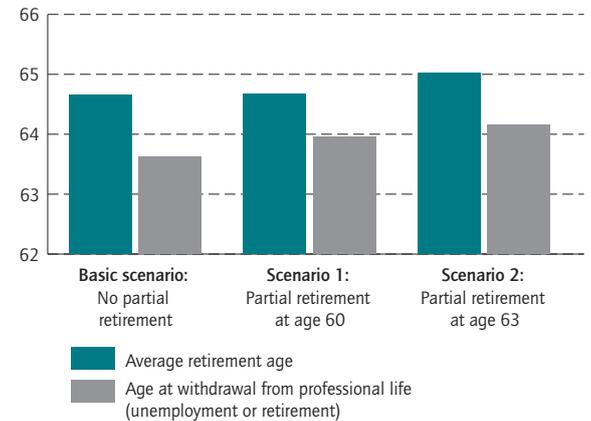
Only partial retirement beginning at 63 leads to an increase in employment volume

The simulation depicts the effects on employment caused by partial retirement beginning at 60 and 63. It shows the respective proportions among the male West German population over the age of 55 in the three possible pension paths (see Box), the average age at retirement (i.e., the beginning of pension receipt), the average age

Figure 2

Employment exit and retirement entry

Average age



Source: Author's own calculations.

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Partial retirement leads to an extension of working lives.

when exiting the work force (entry into unemployment or the beginning of pension receipt), the average annual share of full-time equivalent employment, and the average annual shares of each employment status.

The results of the simulation show that introducing partial retirement changes people's behavior regarding retirement entry. A larger share of the population chooses partial retirement, which reduces the proportion of regular retirees as well as those who enter into early retirement after unemployment.¹⁴ About 44 percent opt for partial retirement when the entry age is 60, whereas this proportion is reduced to 27 percent when the entry age is raised to 63 (Figure 1).

The results also show that partial retirement increases the average retirement age, which varies strongly depending on the partial retirement entry age. With an entry age of 60, the average retirement age increases by only about two weeks from an average retirement age of 64 years and 8 months in a scenario without partial retirement (Figure 2). However, if the entry age is 63, the same as the early retirement age, the average retirement entry age rises by 4.4 months to 65 years. The older the entry

¹⁴ The birth cohorts analyzed in this study have the possibility not only to enter retirement at the normal age, but also to enter early retirement after a period of unemployment. The age limits and deductions for this possibility of early retirement increase gradually between these cohorts. This variation was taken into account in the estimation of the model.

age for partial retirement, the lower the proportion of the population that chooses early retirement. This suggests that partial retirement starting at 63 could counteract potential early retirement (with corresponding pension deductions) through part-time work.

In the simulation, the average age when leaving the work force increases more than the retirement age, as the average unemployment rate decreases from 8.6 to 6.1 percent. More specifically, introducing partial retirement with an entry age of 60 extends the amount of time spent in the work force by around 4 months (from 63 years and 7 months to 63 years and 11 months). This shows that partial retirement has a positive impact on employment because more people opt for partial retirement instead of voluntarily becoming unemployed.

With an entry age of 63 (Scenario II), the proportion of unemployed persons increases in comparison to an entry age of 60 for partial retirement (Scenario I) but still remains below the level of the baseline scenario without partial retirement (Figure 3). Despite a higher proportion of unemployed persons when partial retirement has a later entry age, the study concludes that the average working life and employment volume expressed in full-time equivalents increase. The average age when exiting the work force increases by 6.5 months (from 63 years and 7 months to 64 years and 2 months) when it's possible to enter partial retirement at 63. This also impacts the employment volume.

With an entry age of 60 for partial retirement, the average employment volume is below the level of the baseline scenario without partial retirement. However, the employment volume increases by 3.4 percent compared with the baseline scenario when the entry age for partial retirement is set at 63. In this scenario, the proportion of full-time workers is even higher than in the baseline scenario, despite the increase in partial retirement. The proportion of full-time workers is greater than the share in the baseline scenario until partial retirement is possible. This indicates that some people would work full-time for more years in anticipation of a partial retirement. Leaving the work force earlier would result in a loss of the partial retirement option. Thus, partial retirement that begins at the entry age for early retirement leads to substantially higher employment than a scenario without partial retirement (Figure 4).

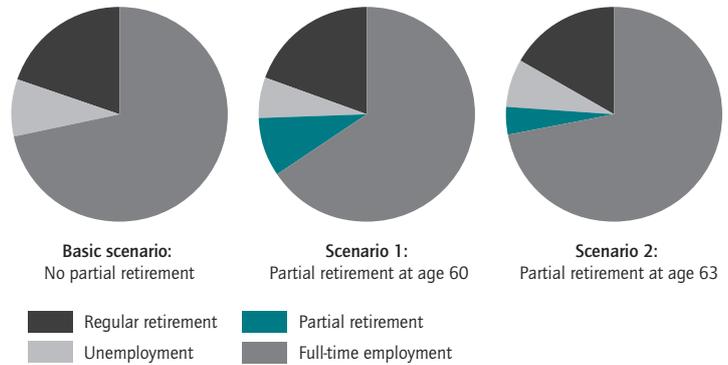
Partial retirement has positive effects on government budgets

To calculate the fiscal consequences of the simulated partial retirement schemes starting at the ages of 60 or 63, the scenarios with partial retirement beginning at 60 (Scenario I) and at 63 (Scenario II) are lacking

Figure 3

Employment effects

Percentage share of West German men between ages 55 and 67



Source: Author's own calculations.

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The share of people in full-time employment increases in a partial retirement regime with an entry age of 63.

partial retirement compared with the baseline scenario. In terms of costs, the calculations include pension payouts and unemployment payments, and on the revenue side, social security contributions and income tax payments. The table displays average payments in euros per person starting at age 55 until death. Both partial retirement scenarios have a positive effect. With an entry age of 60, introducing partial retirement leads to an increase in public revenues by 3.3 percent per person; with an entry age of 63, it leads to an increase by 3.2 percent per person, which equates to a total of around 6,000 euros per person.

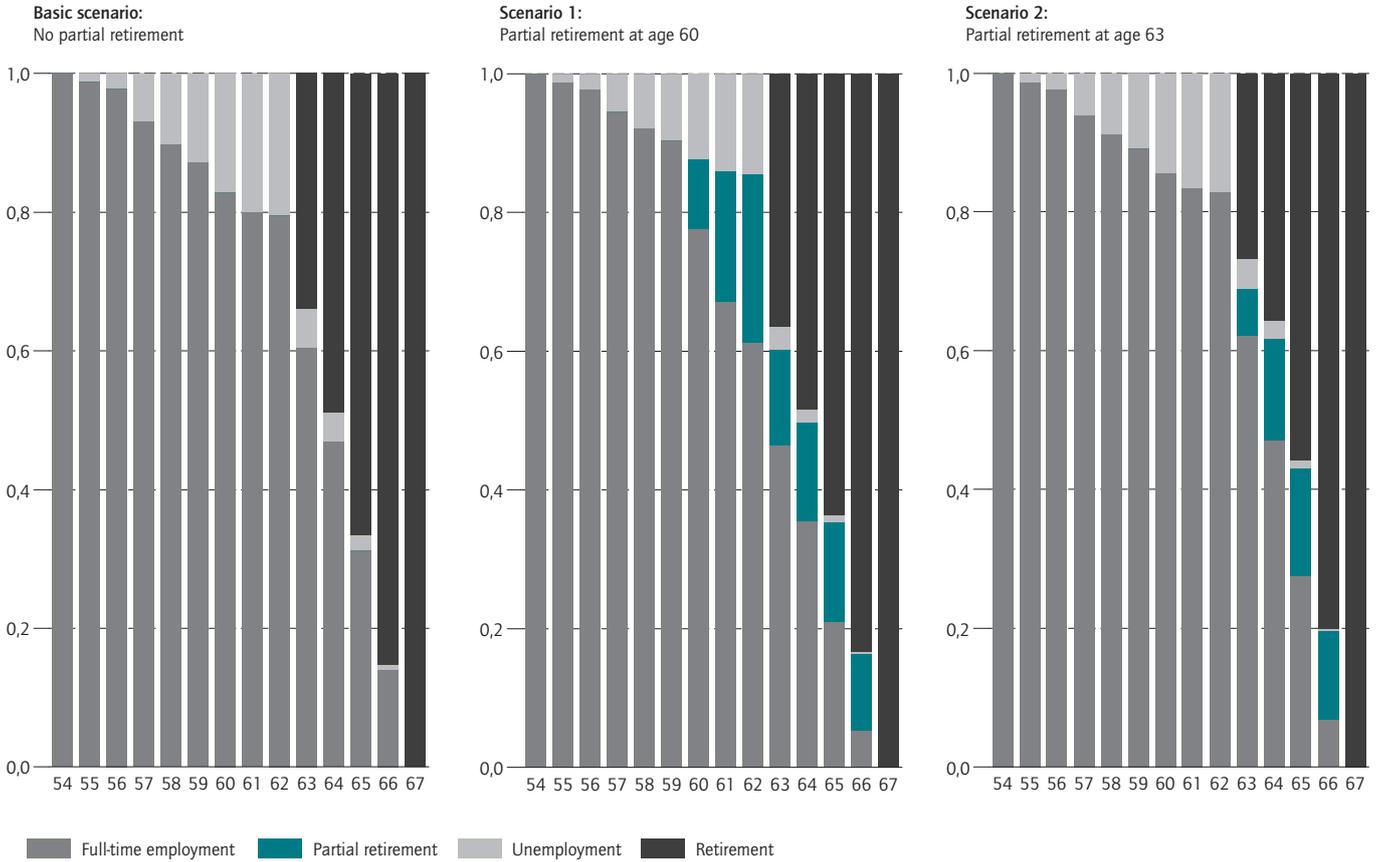
The differences in the fiscal implications between partial retirement beginning at 60 and at 63 are depicted in individual financial positions. Partial retirement beginning at 60 leads to a reduction in pension payouts by an average of 9,000 euros per person over the duration of the payout, whereas partial retirement beginning at 63 does not significantly alter the amount of the average pension payout. A reduction in pension payments has a positive effect on government budgets, but that also means that individual pensions decrease and thus lead to lower incomes in old age.

Furthermore, the analysis shows that the retirement age increases in case of partial retirement. Therefore, in these scenarios, pensions are paid out for a shorter average time. The reduction in pension payouts can thus be attributed to three factors. Those in partial retirement receive a part of their pension with deductions, collect only part of their earnings points every year they're in partial retire-

Figure 4

Age effects in employment states

In percent for each employment state



Source: Author's own calculations.

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The average time in full-time employment is prolonged in a partial retirement regime with an entry age of 63.

ment, and receive their pension payouts over a shorter period of time than in a non-partial retirement scenario. Above all, deductions for a pension begun at 60 can make up a significant part of the reduction, since the deductions in this case amount to 25.2 percent of the pension.

With regard to social insurance contributions and income tax payments, partial retirement starting at 60 leads to a reduction of 5,600 euros per person, whereas the contributions and payments increase by a total of approximately 4,100 euros per person when partial retirement begins at 63. This is due to higher full-time employment when partial retirement starts at age 63.

In summary, the increase in government budgets is due to reductions in pension payouts in the case of partial retirement beginning at 60, whereas it is due to higher

employment and consequently higher social security contributions and income tax payments in the case of partial retirement starting at 63.

Conclusion: Policies should increase promotion of partial retirement

The four analyses presented here show that unrestricted access to partial retirement can lead to an increase in employment volume. The employment effects are particularly positive if the entry age for partial retirement is the same as the early retirement age of 63. This reduces the number of people entering early retirement with the corresponding pension deductions.

Furthermore, the partial retirement scheme presented here has a positive effect on government budgets. Here,

Table

Fiscal effects of partial retirement

Average in euros per person from age 55 until end of life

Fiscal effect	Basic scenario: No partial retirement	Scenario 1: Partial retirement at age 60		Scenario 2: Partial retirement at age 63			
	Sum in euros	Sum in euros	Difference to basic scenario (euros)	Difference to basic scenario (percent)	Sum in euros	Difference to basic scenario (euros)	Difference to basic scenario (percent)
Pension payouts	-350 170	-341 210	8 960	2.56	-350 160	10	0.00
Unemployment payments	-9 148	-6 447	2 701	29.53	-7 594	1 554	16.99
Social security contributions	115 200	112 920	-2 280	-1.98	118 010	2 810	2.44
Income tax	64 299	60 931	-3 368	-5.24	65 617	1 318	2.05
Net effect	-179 819	-173 806	6 013	3.34	-174 137	5 692	3.16

Source: Author's own calculations.

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too, there are important differences depending on the entry age. The simulations show that the positive effects of partial retirement starting at 60 are primarily achieved through reducing pension payouts. If it is first possible to enter partial retirement at the same age as it is possible to enter early retirement, the running costs for pensions hardly change. However, additional income comes from higher taxes and social security contributions which are achieved through higher employment. It must also be taken into account that this study is based on a random sample of West German men. Therefore, the results cannot be fully applied to the whole population.

With the introduction of flexible retirement in Germany in two phases on January 1 and July 1, 2017, the possibilities for a more flexible transition into retirement have improved. Since flexible retirement is only a possibility once the early retirement age has been reached, partial retirement's potentially negative effects on employment are reduced. The ability to enter into flexible retirement before the normal retirement age was first made possible in July 2017. Therefore, it is not yet possible to estimate how many people will actually make use of flexible retirement.

Our simulations show that there is presumably a large demand for partial retirement and that it can lead to positive effects on employment. However, it is important for

the realization of the positive effects on employment that the combination of pensions and part-time work does not become financially unattractive as a result of high reduction rates when receiving partial pension payouts. The abolition of rigid supplementary income limits was a step in the right direction with the introduction of flexible retirement, but the computation of supplementary income limits for flexible retirement is still very complex.

It is not yet clear to what degree companies will use flexible retirement. According to the current legislation, an application for a reduction in work hours must be approved by the employer. Moreover, the possibility to apply for reduced hours does not exist in companies with fewer than 15 employees.

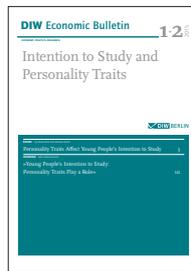
An evaluation of the new, more flexible transition into retirement is important in order to find out how strongly these factors influence the decision for a flexible retirement. If flexible retirement proves itself to be too complex and financially too unattractive for employees, consideration should be given to simplifying and reducing the reduction rate to pension payouts in flexible retirement. If it turns out that few businesses agree to a flexible retirement, then a legal right to partial retirement should be considered. However, exceptions—especially for small companies—still need to be discussed.

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