The Impact of the COVID-19 Pandemic on the German Pension System

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Abstract
The COVID-19 pandemic was declared over in April 2023. Like the financial crisis of 2008, the pandemic outbreak had an exogenous shock effect on Germany's micro- and macroeconomic environment. This mainly affected the labor market, and after that, the Bundesregierung took measures to stabilize the labor market to prevent a dramatic increase in unemployment. The German pension system is a pay-as-you-go system that is financed on a long-term basis by demographic and economic developments. Based on these factors, projections on the effects of the COVID-19 pandemic on statutory pension insurance in Germany were already made in 2020. This paper compares the forecasts from 2020 with the actual development, combined with whether German pension insurance can be assessed as sustainable after the pandemic.

Keywords
COVID-19, Demographic development, Labour market, Pension system, Germany

JEL classifications
H6, H55, J11

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Introduction

Similar to the 2008 financial crisis, the outbreak of the COVID-19 pandemic and the health policy measures required by the German government to contain it led to the worst economic slump in decades in Germany during the first half of 2020 (Bundesbank 2020). The macroeconomic effects on the labor market sparked by the lockdown significantly slowed economic performance. Even with the strong recovery in the summer, the actual gross domestic product reached a growth rate of -5 percent for 2020 (German Council of Economic Experts 2020). The unemployment rate reached a high of 5.9 percent (Federal Employment Agency).

To slow down the spread of COVID-19 infections on the one hand and to maintain economic activity as far as possible despite the necessary restrictions on the other, the federal government took a variety of measures. In particular, the expanded actions for short-time work were at the forefront of preventing unemployment (Ebbinghaus and Lehner, 2022). To this end, the conditions for short-time allowance were improved, and access was made more accessible to avoid the loss of numerous jobs in the labor market. Employed persons whose working hours are reduced by at least 50 percent receive 70 - 80 percent of their flat-rate net pay. The Federal Employment Agen-

cy reimburses companies for social security contributions (Federal Government 2020), ensuring the contribution payments of future pension claims (Geyer et al., 2021).

Ebbinghaus et al. (2020) considered the outbreak of the COVID-19 pandemic as an "exogenous shock" that also affected the pension system's stability. Jedynak (2018) defines a pension system's long-term financial stability and sustainability by its "sustainability." In." the German pension system, the statutory pension insurance is pay-as-you-go (PAYG), whose sustainability is reflected by the dependency ratio between the employed (contributors) and pensioners (recipients). According to Natalie (2020), the exogenous shock resulted in restrictions on economic performance on the one hand and massive effects on the labor market on the other. The decline in employment in the labor market reduced the contribution inflows of workers who need pay-as-you-go pension systems to be sustainable.

Börsch-Supan and Rausch (2020) predicted at an early stage that the outbreak of the COVID-19 pandemic would have an impact on statutory pension insurance in Germany. The assumptions were based on the relevant parameters 1. demographic development and 2. economic development and evaluated. For this purpose, economic development was considered under similar translation ratios from the 2008 financial crisis of GDP decline and employment decline under diversified scenarios. According to their analysis, the COVID-19 pandemic, identical to the 2008 financial crisis, will significantly impact statutory pension insurance.

The German Health Minister Karl Lauterbach considers the COVID-19 pandemic to be over in April 2023, about three years after the outbreak and draws a positive balance from a health policy perspective (Welt 2023).

This paper compares the forecast of Börsch and Rausch from the year 2020 with the actual developments of the demographic and economic parameters used during the COVID-19 pandemic in Germany. It takes stock from a pension policy perspective. The first chapter examines the demographic development indicators, and in the second chapter, the GDP development and employment level are discussed under the heading of economic growth. Likewise, the development of Germany's proportionate state pension expenditure to GDP is projected in international comparison to the OECD average.

Finally, the results of the comparison are presented in conclusion. Furthermore, the question is clarified whether the statutory pension insurance in Germany has withstood the effects of the COVID-19 pandemic and can be considered sustainable. In the course of answering the question, the paper will offer an outlook on the future of the German pension system.

The findings on the parameters are compared with the actual values in each chapter and evaluated. Current data from the OECD, the Federal Statistical Office, and the Federal Employment Agency are used. In addition, relevant literature is used.

Finally, the results of the comparison are presented in conclusion. Furthermore, the question is clarified whether the statutory pension insurance in Germany has withstood the effects of the COVID-19 pandemic and can be considered sustainable. In answering this question, an outlook on the future of the German pension system is given.

1 Demographic development in Germany

According to the assumptions of Börsch-Supan and Rausch (2020), demographic development is influenced by very long-term trends. These include long-term trends such as the birth rate and life expectancy. Even if the duration of the pandemic is uncertain for an indefinite period since the outbreak, it is not expected to have a significant long--term impact on demographic development. Even if pensioners as contributors in the pay-as-you-go pension system are classified in the risk group, no significant influence is to be expected due to increasing deaths. Approximately 932,000 deaths occurred in 2017. Against this background, demographic development was not considered further during the further study by Börsch-Supan and Rausch (2020) and thus will not achieve any effects.

The Organisation for Economic Co-operation and Development (OECD) has been analyzing and comparing pension systems in the OECD and G20 countries every two years since 2005 in the report "Pensions at a Glance" based on indicators, thus making a considerable contribution to scientists and politicians. In this context, the OECD provides grants of hand in the demographic and economic context.

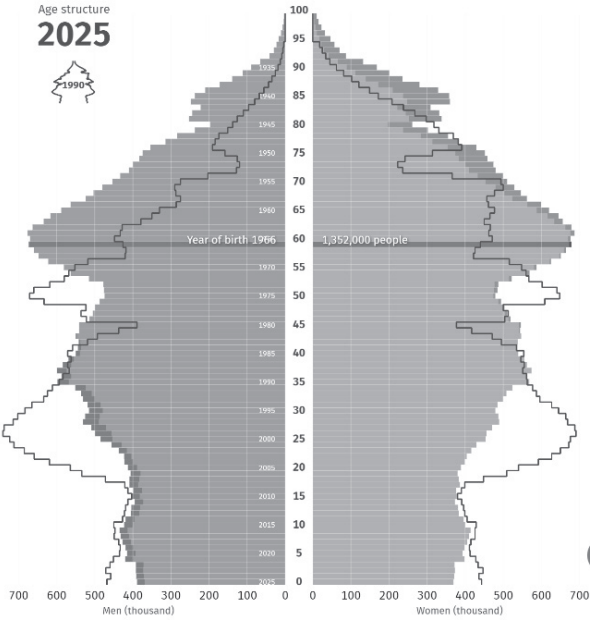
The 2021 edition of the report, Pensions at a Glance, discusses the impact of the COVID-19 pandemic on the pension systems of OECD member countries in two special chapters. The report provides evidence that the COVID-19 pandemic had an effect on demographic development and thus had a direct influence on the German pension system. Nevertheless, it is clear from the report that with the continuation of the demographic trend, the age pressure on pension systems requires urgent action (OECD 2021).

The assumption on demographic development by Börsch-Supan and Rausch (2020) was compared with the OECD report "Pensions at a Glance" 2021. This confirms that demographic growth is not significantly influenced in the long term.

However, Fenge and Peglow (2017) research found that Germany will face a significant population aging in the coming decades. The changes in the population structure lead to a growing mismatch between the development of pension expenditure and contribution income, raising concerns about the pension system's sustainability (Eilfort and Raffelhüschen, 2010). This will further burden the German national budget (Blank et al., 2021).

Figure 1 below compares the age structure in 2025 with the year of German unification in 1990 and illustrates the progress of demographic development, characterized by the long-term trends of the decreasing number of people of younger age and the increasing number of older people. This population calculation was made based on data from the Federal Statistical Office, using reasonable assumptions on the development of birth rates, life expectancy, and net migration.

Figure 1: Comparison of the German population calculation of 1990 and 2025



Source: Destatis, 2023

This confirms that the assumption in the forecast by Börsch-Supan and Rausch (2020) was correct in that demographic development is influenced by very long-term trends. Similarly, in its report, the OECD points to continuing the demographic trend, which increases the age pressure on pension systems and thus requires urgent action.

2 Economic performance

2.1 GDP

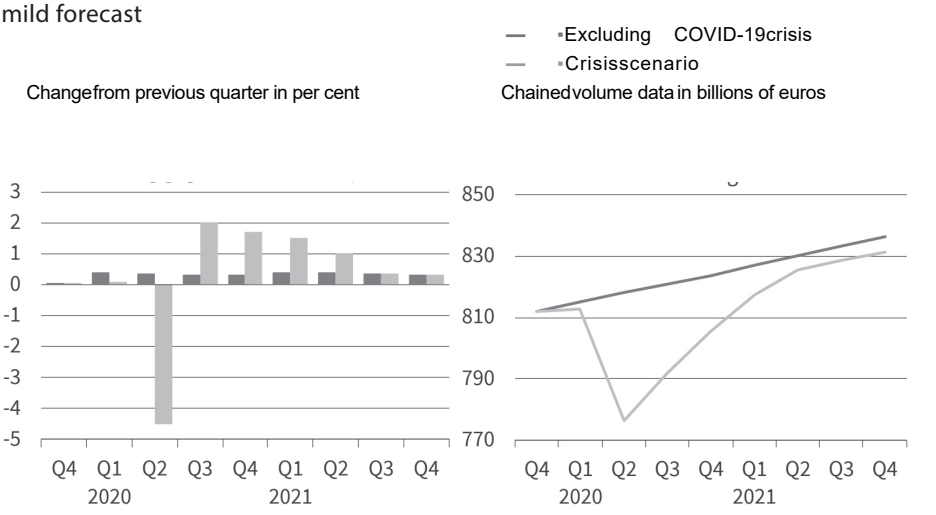
According to Börsch-Supan and Rausch (2020), in contrast to demographic development, economic performance is affected by the impact of the COVID-19 pandemic. As a result, they refer to initial assessments by German economic research institutes, which base their estimates of economic development on the experience of previous crises. In this context, the financial forecasts of the Ifo Institute (ifo), the Institute for Economic Research (DIW), and the Institute for the World Economy (IfW) were considered, resulting in six possible forecasts under risk considerations, which influenced the development of employment on the labor market. Against this background, we first examine German economic performance in this chapter and limit ourselves to the business cycle forecasts of Wollmershäuser (2020) from the Ifo Institute.

According to Wollmershäuser (2020), the internationally interconnected economy is collapsing due to the COVID-19 pandemic. The argument is that the virus originated in China and, due to the rapid development of the infection, the economy has come to a virtual standstill or collapsed due to the measures taken. As a result, Germany's economic output will shrink, substantially impacting the labor market. Moreover, Germany is closely intertwined economically with many countries worldwide, in addition to China, and the related interaction between imports and exports will be significantly disrupted.

As already mentioned, the first forecasts of the German economic research institutes on economic development were based on observations in China and previous crises. Wollmershäuser (2020) supported his forecast with the fact that, according to his observations in China, industrial production there slumped by 30 percent between December 2019 and February 2020. In March, the business climate index in Germany fell by 8.3 index points and business expectations by 11.2 index points. On this basis, Wollmershäuser (2020) developed 1. a mild forecast and 2. a risk forecast.

1. Mild forecast: The mild forecast assumes a 4.5 percent slump in GDP in the second quarter of 2020, which recovers quickly in the same quarter and resumes the original trend by the third quarter, without the COVID-19 impact. However, Wollmershäuser (2020) assumes downside risks to this forecast. Namely, if 75 percent of average capacity continues to be utilized, each month would lose about 2 percent of economic growth. Figure 2 below summarises the results of the indicator analysis and the scenario analysis. It is important to note that the GDP bars in the left-hand chart consider the pent-up economic demand and therefore turn, around in the third quarter after the slump in the second quarter.

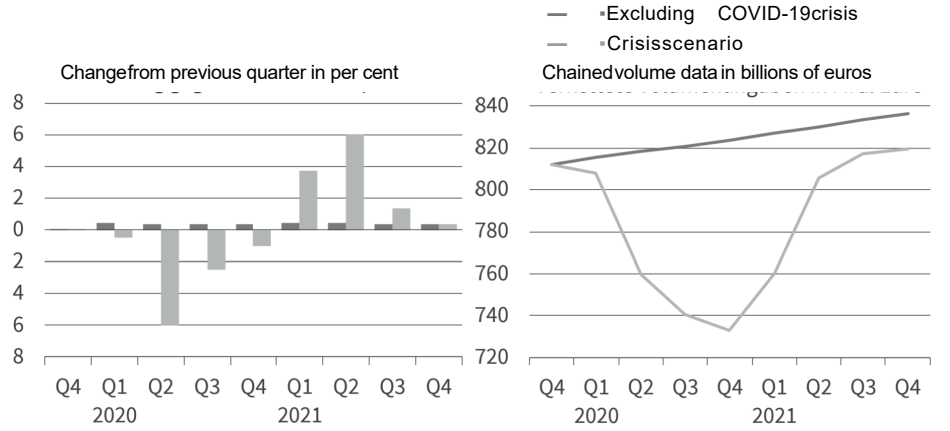
Figure 2: Development of a gross domestic product for Germany according to mild forecast



Source: Wollmershäuser, 2020

2. Risk forecast: Wollmershäuser (2020) assumes in his risk forecast that the decline in GDP will continue until the end of 2020, resulting in a contraction of around 6 percent. Only in 2021 is GDP expected to recover so that by the end of the year, GDP development will be 2.4 percent below the initial development, excluding the COVID-19 impact. Figure 3 below summarises the results of the indicator analysis and the scenario analysis.

Figure 3: Development of a gross domestic product for Germany according to risk forecast

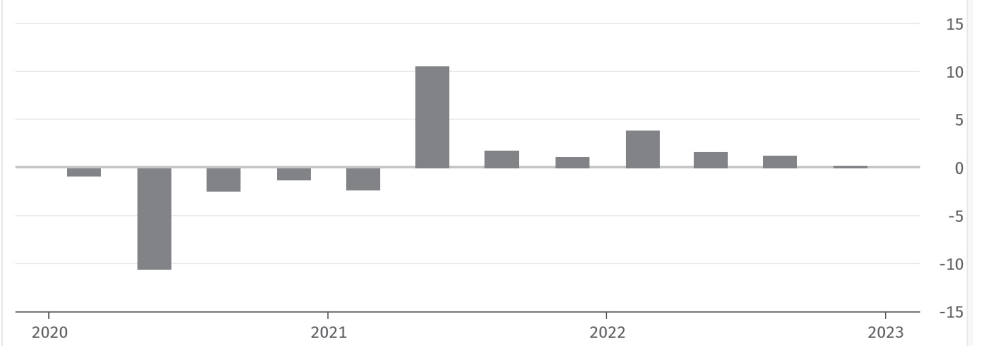


Source: Wollmershäuser, 2020

The Federal Statistical Office (StBA) is a German federal authority that collects, collates, and analyses statistical information on the economy, society, and the environment, thus making a significant contribution to science and politics. In this context, the StBA also provides grants to national accounts.

Figure 4 shows the development of GDP adjusted to the previous year's quarter according to data from the StBA (2023).

Figure 4: GDP development compared to the same quarter of the previous year in Germany

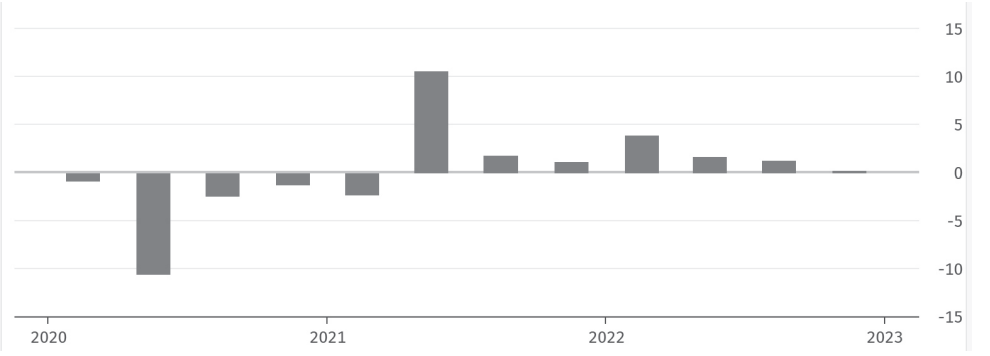


Source: Statistisches Bundesamt, 2023

According to the StBA (2023), adjusted GDP slumped by 10.5 percent compared to the same quarter of the previous year. Only in the second quarter did GDP recover from the same quarter of the last year and grow by 10.6 percent. In the third quarter, growth fell to 1.8 percent compared to the same quarter of the previous year. On average, the level flattened to 0.3 percent at the end of 2022.

Figure 5 shows the price-adjusted change in GDP compared to the previous year.

Figure 5: Change in GDP compared to the previous year in Germany



Source: Statistisches Bundesamt, 2023

According to the StBA (2023), GDP slumped by 3.7 percent in 2020 compared to the previous year. In 2021, they llallowedositive economic growth by 2.6 percent compared to 2020. In 2022 they achieved economic growth of 1.8 percent overall compared to 2021.

The comparison between the effects of the COVID-19 pandemic on the statutory pension insurance in Germany examined by Börsch-Supan and Rausch (2020) based on the economic forecasts of Wollmershäuser (2020) with the data of the StBA (2023) show parallels to the risk forecast. Thus, GDP in the first quarter collapses dramatically compared to the same quarter of the previous year. In real terms, GDP shrinks by 10.5 percent instead of around 6.0 percent, as initially assumed. Moreover, GDP recovered in the second quarter of 2021 compared to the same quarter of the previous year, reaching economic growth of 10.6 percent and up to 6.0 percent initially assumed. From the fourth quarter onwards, the actual values and the forecasts are at the same level. In this respect, there are deviations between the estimates and the actual values up to the third quarter of 2021. Finally, it is noted that the comparison focuses on the impact of the COVID-19 pandemic on GDP.

2.2 Labour market

In Chapter 2.1, we examined the forecasts of Wollmersheimer (2020) used by Börsch--Supan and Rausch (2020) and focused on the GDP impact. According to Börsch-Supan

and Rausch (2020), the isolated consideration of GDP is only indirectly relevant to statutory pension insurance. In the German pension system, the statutory pension insurance is a pay-as-you-go system, the sustainability of which is reflected in the dependency ratio between employed persons (contributors) and pensioners (beneficiaries). Against this backdrop, employment in the labor market is of considerable importance. PAYG pension schemes are directly affected by the impact of the COVID-19 pandemic, with increases in the number of unemployed and reduced contribution income (Feher and Bidegain, 2020). According to Natalie (2020), the exogenous shock generated by the COVID-19 pandemic outbreak led to restrictions on economic performance on the one hand and massive impacts on the labor market on the other. The decline in llabormarketemployment reduced the contribution inflows of the working population, which depend on pay-as-you-go pension systems to be sustainable.

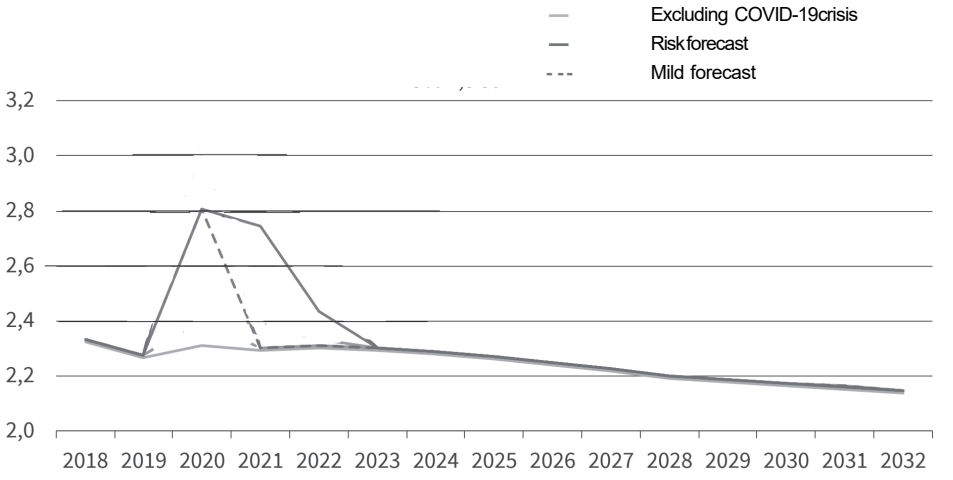
According to Börsch-Supan and Rausch (2020), the impact of the COVID-19 pandemic on the labor market depends on the measures the federal government takes. Measures must aim to prevent or cushion a surge in unemployment. Cantillon et al. (2021) note that similar to the financial crisis of 2008, the federal government has taken extensive measures, especially short-time work, to mitigate the adverse effects on the labor market. This measure proved to be a very effective labor policy instrument in 2008; therefore, Germany has a long tradition of short-time work.

The Bundesregierung implemented a number of measures to prevent the spread of COVID-19 infections on the one hand, and to sustain economic activity as much as possible despite the necessary restrictions on the other. Above all, the expanded actions for short-time work were in the foreground to prevent a sudden rise in unemployment (Ebbinghaus and Lehner,2022). To this end, the conditions for short-time allowance were improved, and access was made more accessible to prevent the loss of numerous jobs in the labor market. Employed persons whose working hours are reduced by at least 50 percent receive 70 to 80 percent of their flat-rate net pay. The Federal Employment Agency reimburses companies for social security contributions (Federal Government 2020), securing the contribution payments for future pension entitlements (Geyer et al., 2021).

Due to the parallel to the financial crisis and the associated measures of the German government, Börsch-Supan and Rausch (2020) assume a similar ratio of GDP decline and employment decline. Accordingly, it is assumed that a 1 percent decline in GDP caused by the COVID-19 pandemic will result in a decrease in the employment of 95,000 people and an increase in unemployment of 88,000 people. This assumption takes into account the 20% increase in employment since 2008.

Figure 6 below shows the development of the number of unemployed based on the calculations of Börsch-Supan and Rausch (2020) about the decline in GDP. Here we consider the economic forecast examined by Wollmersheimer (2020).

Figure 6: Number of unemployed about GDP decline



Source: Börsch-Supan and Rausch (2020) and adaptations by the author

In the year of the calculations by Börsch-Supan and Rausch (2020), it was unclear how long the COVID-19 pandemic would last. Two scenarios were assumed. On the one hand, a rapid recovery in 2021 that returns to the original pledge in the same year and, on the other hand, a slow recovery that returns to the initial deposit in 2023. In both cases, the number of unemployed increases by about 500,000 people to approximately 2,800,000 unemployed, especially taking into account short-time work.

According to the Bundesagentur für Arbeit (2023), the number of unemployed in March 2020 rose from 2,335,370 to 2,955,490 people by August 2020. This means that the unemployed increased by 620,120 people in real terms. The original level of 2,376,930 unemployed was reached for the first time in October 2021 and remained constant at an average of 2,400,000 unemployed until the end of 2022.

The comparison between the development of the number of unemployed examined by Börsch-Supan and Rausch (2020) about the decline in GDP based on Wollmershäuser (2020) and the data of the Federal Employment Agency (2023) shows parallels to the risk forecast. Thus, the assumptions of Börsch-Supan and Rausch (2020) regarding a rapid recovery in the number of unemployed in 2021 return to the original pledge. It must be assumed that the measures taken by the federal government, especially about short-time work, have contributed significantly to cushioning the sudden increase in the unemployed. Nevertheless, the number of unemployed, 620,120 people, is 120,120 people, higher than the forecast of 500,000 people. This makes a further difference of 120,120 contributors.

2.3 Comparison of the projection of state pension expenditure as a share of GDP

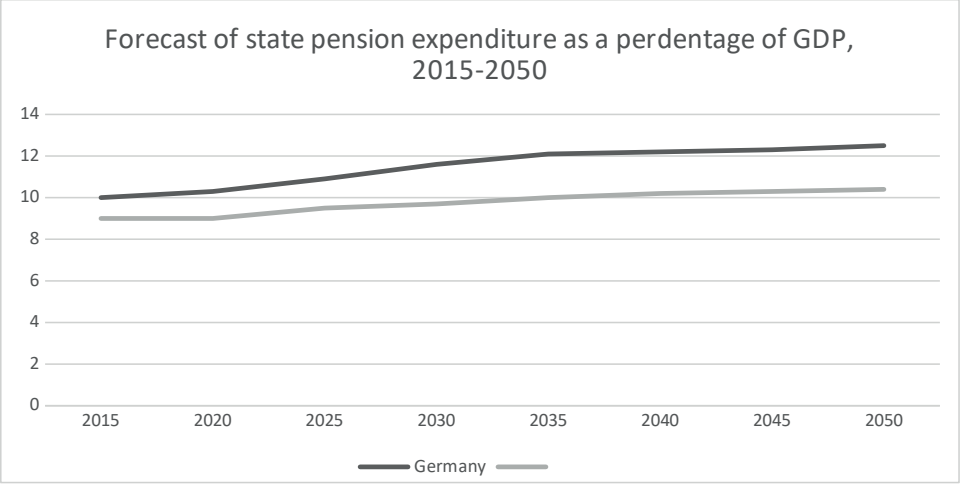
The following section deals with the proportion of Germany's GDP spent on public pensions and thus shows how much of the gross domestic product is spent on public pensions and how high the total share of public pensions in the national budget is in Germany. German public pension expenditure development is compared with the OECD average retrospectively from 2017 to 2050.

According to the OECD (2015), most OECD member states have increased public pension expenditure. From 2015 to 2020, public pension expenditure in all OECD member states averaged 9 percent of GDP. During this period, public pension expenditure in Germany increased from 10.0 percent to 10.3 percent of GDP.

The OECD (2021) expects public pension expenditure in all OECD member states to increase on average from 9 percent to 10.4 percent of GDP by 2050. On the other hand, the projections for Germany indicate an increase from 10.3 percent in 2020 to 12.5 percent of GDP by 2050.

Figure 7 illustrates the development of public pension expenditure as a percentage of GDP in Germany on average for the OECD from 2015 to 2050.

Figure 7: Forecast of state pension expenditure as a percentage of GDP, 2015-2050



Source: OECD-Data (2015) and (2021) and adaptations by the author

Thus, state pension expenditure as a percentage of GDP in Germany is above the average of the OECD member states over the period under review. Furthermore, it can be seen that public pension expenditure is increasing significantly faster than the OECD average.

3 Conclusions

This article aims to compare Börsch and Rausch's 2020 forecast with the natural development of the demographic and economic parameters used during the COVID-19 pandemic in Germany and to draw a balance in terms of pension policy. For this purpose, the indicator of demographic development was examined in the first chapter, and the second chapter studied the economic performance regarding GDP and employment level under the hand. The aim is to clarify whether the statutory pension insurance in Germany has withstood the effects of the COVID-19 pandemic and can be considered sustainable. In answering this question, an outlook on the future of the German pension system will be given.

Regarding the economic performance indicators, it was found that the results between the forecasts and the actual values showed parallels and were close to each other despite conditional deviations. The results suggest that the impact of the COVID-19 pandemic, similar to the 2008 financial crisis, will significantly increase fiscal pressure and thus burden government spending. Even if the labor policy instrument of short-time work has proven to cushion the sudden increase in the number of unemployed, it should be noted that the sustainable viability of the pay-as-you-go pension system in Germany can only be compensated for in the short term by the public debt that is taking place. In this respect, it is confirmed that the pension system reacts sensitively to a massive contraction of the economy.

Against this background, the statutory pension insurance in Germany has withstood the effects of the COVID-19 pandemic. Once again, resilience has been proven when government spending compensates for an exogenous shock. The OECD supports this finding in the "Pensions at a Glance 2021" report. According to the OECD, pension systems have coped well with the COVID-19 pandemic.

From a demographic perspective, the COVID-19 pandemic did not impact the German pension system. However, Germany will be confronted with a significant population aging in the coming decades. The changes in the population structure lead to an increasing mismatch between the development of pension expenditure and contribution income, raising concerns about the pension system's sustainability. This will put further strain on the German national budget. From these circumstances, age pressure will again come to the fore. The OECD also emphasizes this.

In conclusion, from a pension policy perspective, German statutory pension insurance has withstood the effects of the COVID-19 pandemic and can thus draw a positive balance. Against the background of demographic change, however, it needs to be more sustainable in the medium term.

Looking to the future, the German pension system will have to face the challenges of demographic change to be sustainable. One possible approach at present is the Federal Government's well-funded pension.

For this purpose, examining the conclusions using more advanced methods is necessary.

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