GDP-Linked Loans for Greece

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Greece is standing at a crossroads. The need for a third rescue package has now become a critical issue. The Greek government is calling for another de facto-public debt restructuring. An alternative option presented here would be to convert existing GLF loans into GDP-linked loans. Interest payments would then be linked to the development of Greece's GDP. First, this would reduce the likelihood of Greece defaulting on its loans and, hence, the risk to German taxpayers. Above all, however, it would achieve the aim of stabilizing Greece's debt ratio even if growth was weak. Second, GDP-linked loans would give Greece a greater incentive to take more responsibility for its reforms and improve their chances of success. Third, indexed loans would ease pressure on the Greek government in the short to medium term by temporarily postponing interest payments, and allowing it to pursue a less procyclical fiscal policy. Fourth, lenders would benefit because the loan repayments might ultimately be higher, once the Greek economy has recovered and is growing again.

Five years after the beginning of the economic crisis and four years after international lenders implemented the first bailout programs, Greece finds itself at a crossroads. Despite signs of economic recovery, public finances remain strained. In 2013, both the general government deficit and the primary deficit (excluding interest payments) increased again compared to the previous year. These amounted to 13 and nine percent of gross domestic product (GDP), respectively. Only after adjusting for non-recurring costs there was a primary surplus of around one percent in 2013. In its April 2014 forecasts, the European Commission predicts a further increase of the debt ratio to 177 percent of GDP, which is then to be reduced to around 125 percent by 2020.[1] For 2014 and 2015, the International Monetary Fund (IMF) and the European Commission expect the Greek financing gap to total 12 to 15 billion euros.[2] It is doubtful whether this gap can be completely closed through the capital market alone.

With the final tranche of the European part of the second rescue package are foreseen to be payed out at the end of 2014, the issue of a third bailout for Greece has become critical. The Greek government is calling for another de facto public haircut in the form of even lower interest, longer maturities, and an extended period of grace of several years for its loans.[3] However, this will not be enough to close the financing gap for the coming years, particularly if economic recovery does not pan out as expected which was repeatedly the case in recent years (see Figure 1).

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1 See European Commission, "The Second Economic Adjustment Programme for Greece Fourth Review – April 2014," European Economy (2014).
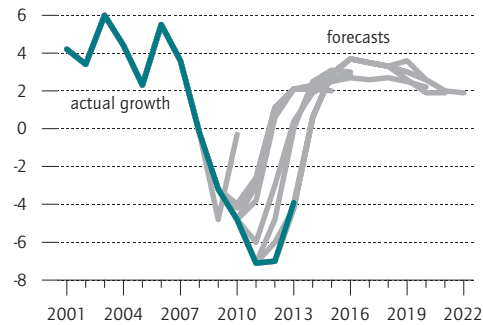
2 See European Commission, "Second Economic Adjustment Programme" and International Monetary Fund, "Greece – Fifth review under the extended arrangement under the extended fund facility" (2014).

3 See "Athen will kein drittes Hilfspaket," Handelsblatt live, June 26, 2014.

Figure 1

Predicted and Actual Economic Growth

In percent

[Chart: line graph showing actual growth and forecasts from 2001 to 2022, with y-axis from -8 to 6 percent]

forecasts

actual growth

2001   2004   2007   2010   2013   2016   2019   2022

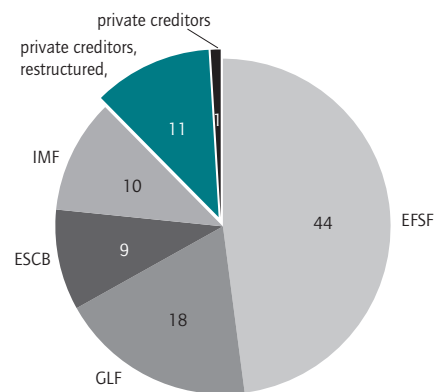*Sources: IMF; calculations by DIW Berlin.*

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Growth forecasts for Greece have frequently been off the mark and too optimistic in the past.

Figure 2

Greece's Outstanding Debt by Creditor[1]

In percent

[Pie chart showing: EFSF 44, GLF 18, private creditors restructured 11, IMF 10, ESCB 9, private creditors 1]

private creditors

private creditors,
restructured,

IMF

ESCB

GLF

EFSF

11

1

10

9

18

44

1 The total debt amounts to 302 billion euros (not including 15 billion euros' worth of Treasury bills), as of July 2014. EFSF = European Financial Stability Facility, GLF = Greek Loan Facility, ESCB = European System of Central Banks, IMF = International Monetary Fund.
Sources: EFSF; IMF; European Commission; calculations by DIW Berlin.

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Around 90 percent of the 302 billion euros of long-term national debt is in public ownership.

The present study proposes a different option, whereby public loans are converted into GDP-linked loans, with interest payments linked to the development of Greek GDP. At present, part of the interest payments is already variable as it is tied to economic performance of the euro area, which means Greece would face difficulties if its own economy develops differently.

First Signs of Economic Recovery in Greece

Since the beginning of the year, the macroeconomic situation in Greece has given cause for hope. In the first quarter of 2014, unemployment fell for the first time in around five years. Survey-based leading indicators on consumer confidence or on the economic climate appear to have bottomed out and are now showing stable upward trends. At around one percent of GDP, the current account surplus is expected to be slightly higher this year than in 2013. Moreover, Greece returned to the capital market in April of this year after a four-year absence.

Despite this positive development, the Greek economy continues to be fragile. GDP fell by 3.9 percent last year, and in the first quarter of 2014, it was still 1.1 percent lower than in 2013. Stagnation is expected for 2014 as a whole. Unemployment continues to be alarmingly high at 27 percent. The annual average rate of inflation is still expected to be negative in 2014 and to only just exceed the zero threshold in the near future.

Tackling the High Level of Debt

Greek public debt amounted to around 302 billion euros or 175 percent of GDP in 2013. Hence, the debt ratio is above the level prior to the haircut (170 percent in 2011) which had temporarily reduced it to 157 percent.

With around half of outstanding debt, Greece's biggest creditor is the European Financial Stability Facility (EFSF) (see Figure 2). By the time the second bailout package expires at the turn of 2014/2015, the EFSF's total receivables will amount to 144 billion euros.[4]

The second biggest creditor, with 18 percent, are the members of the euro area, who granted around 53 billion euros in bilateral loans in the first bailout, the Greek Loan Facility (GLF). The International Monetary Fund and the European System of Central Banks (ESCB) each hold around ten percent of the debt. The latter acquired Greek debt securities as part of the European Central Bank's bond purchasing programme (Securities Market Programme, SMP).

This means that almost 90 percent of long-term liabilities are held by public creditors. The only privately-held liabilities are bonds issued to former owners of Greek debt securities in the course of the debt restructuring and those not included in the debt restructuring.

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4   They currently amount to 134 billion euros.

Figure 3

Greece's Total Redemptions and Interest Payments
In million euros
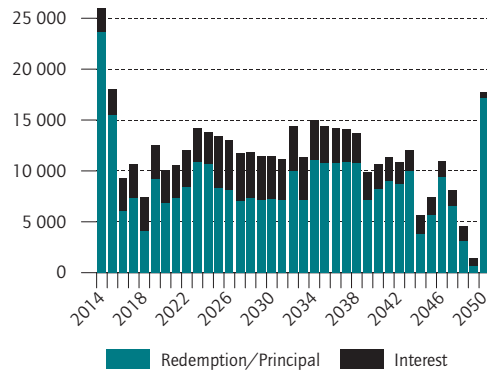
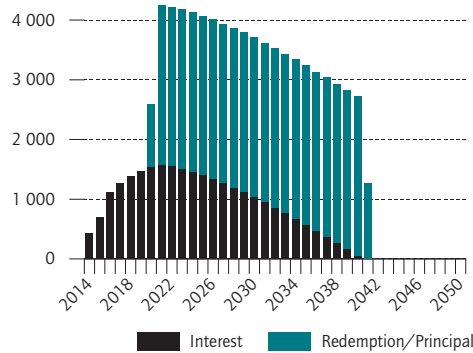Sources: EFSF; IMF; European Commission.

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The repayment burden will be high particularly over the next two years.

Figure 4

Redemptions and Interest Payments in the Greek Loan Facility
In million euros

Sources: EFSF; IMF; European Commission.

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Only interest payments on GLF loans must be paid by 2020.

The debt level and composition is an enormous burden for Greece. In the past year alone, the government had to pay four percent of GDP in interest. This money flows out of the country since almost all liabilities are held outside of Greece, leaving less money for domestic consumption and investment.

In its Fifth Review of Greece dated June 2014, the IMF predicts that the debt ratio in 2020 will drop to 128 percent. This is expected to be achieved through a combination of higher growth, primary surpluses, and lower interest payments. Specifically, the IMF forecasts that GDP will grow at a rate of 0.6 percent in this year. For the years from 2015 onwards, it anticipates rates of mostly over three percent. Inflation is not expected to exceed the zero threshold until the following year, but then increase to two percent by 2022. The primary surpluses are estimated to be 1.5 percent of GDP in 2014 and three to four percent in the years up to 2022. However, IMF forecasts are fraught with uncertainty. Many observers predict lower growth rates.

Third Bailout?

Overall, Greece will have to make particularly high principal payments in 2014 and 2015 (see Figure 3). On the other hand, interest payments are relatively evenly distributed over the entire repayment period. Consequently, there will be a very high demand for funding in the next two years, which could be met through a third bailout. Another option would be to change existing credit terms.

Loans from the Greek Loan Facility (GLF) have a maturity of 30 years. Repayments are spread over 20 years, not beginning until 2020 (see Figure 4). Interest rates are variable. These are derived from the three-month Euribor and a margin of 50 basis points. The current conditions of the loans are already the result of three renegotiations. In their original form the loans only had a term of five years, and the interest margin was supposed to increase gradually from 300 to 400 basis points. Since the predicted recovery of the Greek economy from 2011 to 2013 did not materialize, however (see Figure 1), conditions were repeatedly relaxed.

In order to estimate future interest payments GLF loans, the money market rates expected by market participants are calculated on the basis of current market prices. The interest payments amount to around 400 million euros or approximately 0.2 percent of nominal GDP in the current year. By 2021, interest payments will increase up to 1,600 million euros and will steadily decline thereafter. The decrease reflects redemptions beginning in 2020.

EFSF loans have a maturity of 40 years. Repayments will not begin until 2023. The interest rates are flexible (see Figure 5) and are derived from current EFSF refinancing costs and a margin for operational costs. However, interest has been deferred until 2023. This will then be settled with the addition of compound interest accrued. As with loans from the GLF, the current conditions are already the result of a renegotiation, during which the terms were extended and interest reduced.

The following conclusions can be drawn from the analysis of the two programs. First, up until 2023, Greece only has to pay interest to its European creditors on loans from the GLF. Therefore, this provides the only possibility for an imminent and direct reduction of the interest burden. Second, maturities are already long, and the first repayments are not due until 2020. Consequently, a maturity extension or a later start of the redemptions would have no direct effect on the interest burden in this decade.[5]

A Proposal for Greece: GDP-Linked Loans

Many of the growth forecasts for Greece made since 2010 have been off the mark. This factor has repeatedly contributed to a situation in which lengthy and politically difficult negotiations on new rescue packages and concessions for existing credit agreements were necessary.

One option for a timely and targeted response to changing macroeconomic conditions is to link (index) the interest rate on GLF loandsto the development of Greek GDP. If the growth rate in a particular year is below a predetermined rate, interest is lower. If the opposite is true, it is higher. Interest payments would be in line with the growth rate and thus automatically take into account the financing situation of the Greek government.

The annual average growth of the Greek economy from 1960 to 2013 was three percent. If this were the predetermined reference growth rate and Greece were to pay an interest rate of four percent on its loans, a GDP-linked interest rate would look as follows: for each percentage point below the three percent mark, Greece pays one percentage point less interest on the loans from the GLF. For instance, at a growth rate of two percent, interest would be reduced to three percent. Conversely, at a growth rate of four percent, the interest rate would increase to five percent.[6]

The idea of tying interest rates to economic conditions has in theory and practice primarily been applied to government bonds.[7] All proposals are based on the idea

Figure 5

Maturities and Interest in the EFSF Program for Greece
In million euros

Sources: EFSF; IMF; European Commission.

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Interest payments on EFSF loans are deferred until 2023.

that countries can afford to pay higher interest in times of high tax revenue and the burden will be eased in the opposite scenario.[8]

One well-known example of GDP-linked bonds being used in the recent past is in Argentina, where a security was issued with coupon payments linked to Argentinian growth as part of its debt restructuring in 2005. With the Greek debt restructuring in 2012 a similar warrant was issued to the former creditors of Greek government bonds. At less than half a percent of the overall total, this was a negligible amount, however, primarily intended to increase the participation rate of private creditors in the restructuring offer.[9]

Linking loans to GDP would have numerous economic benefits for both Greece and its European creditors. One of the key advantages would be the automatic stabilizer effect. Unlike fixed interest rates, GDP-linked interest rates fall in a recession, such that primary surpluses necessary to service outstanding debt can be lower (for example, through lower taxes) than otherwise . In an upswing, however, the government has to achieve higher primary surpluses than with fixed interest rates. Con-

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5 They could, however, ease the burden indirectly, for instance, if they lead to lower refinancing costs on the capital market for Greece.
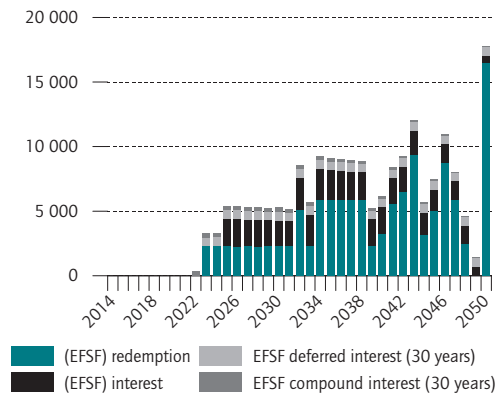
6 This simplified rule could be refined in practice. For instance, floors and caps for the interest rate could be fixed in order to take into account uncertainty about potential future growth.

7 For example, Shiller proposed issuing US government bonds which earn interest in proportion to US GDP growth, see Shiller, The New Financial Order: Risk in the 21st Century (Princeton University Press, 2003). Alternative proposals include linking interest to commodity prices or to exports, see Krugman, "Financing vs. forgiving a debt overhang," Journal of Development Economics 29 (1988): 253–68.

8 This view on debt sustainability is also shared in the literature on strategic government defaults, see Arellano, "Default risk and income fluctuations in emerging economies," American Economic Review, 98 (3) (2008): 690–712. According to this strand of literature, it is precisely during economic downturns that the option of defaulting becomes attractive for a government.

9 J. Zettelmeyer, C. Trebesch, and M. Gulati, "Greek debt restructuring," Economic Policy (2013): 513-563.

Box

Monte Carlo Simulations and Debt Sustainability Analysis

The macroeconomic simulation model used for quantifying the results is based on Chamon and Mauro's approach (2006).[1] This method uses a model economy with limited debt sustainability, which is in the tradition of an ability-to-pay framework. According to the model, there is a partial default and a debt restructuring as soon as a predetermined debt limit weill be exceeded (see below).

The equation for the debt level is as follows:

$$\frac{D_t}{Y_t} = \frac{D_{t-1}\,(1+r_t)}{Y_t} - pb_t = \frac{D_{t-1}}{Y_{t-1}} \frac{(1+r_t)}{(1+g_t)\,(1+\pi)} - pb_t$$

The debt level is calculated by dividing the nominal debt level in year t (D_t) by nominal GDP (Y_t).

Simulated stochastic paths for the real growth rate of GDP (g_t) and the primary surplus (pb_t) are used to generate scenarios for the development of the debt ratio. The simulated growth rate is based on the IMF forecast. This is expanded by adding volatility and persistence which are estimated on the basis of Greek data. Economic fluctuations and uncertainty over the projection are thus integrated into the model framework (see Figure 1).

In the case of debt indexation, it is assumed that the interest rate is a function of the real growth rate:

$$r_t = max\,[\, \bar{r} + \sigma\,(g_t - \bar{g})\,,\, r^{min}\,].$$

The rule states that the indexed interest r_t is at least as high as the minimum interest rate (r^{min}). Furthermore, it is determined by combining the base interest rate ($\bar{r}$) and the difference between the growth rate and the reference growth rate ($g_t - \bar{g}$). Finally, a parameter (σ) governs the elasticity of the interest rate with respect to economic fluctuations. When this parameter has higher values, the interest rate reacts more strongly, allowing for a greater "insurance effect" to be achieved.

Using a simulation path for real GDP growth rates as an example, Figure 2 illustrates how the interest rule impacts on the actual interest rate. The parameters in the simple interest formula are

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1   M. Chamon and P. Mauro, "Pricing growth-indexed bonds," Journal of Banking & Finance 30 (12) (2006): 3349–3366.

Figure 1

IMF Forecast for Greece
Real GDP in billion euros
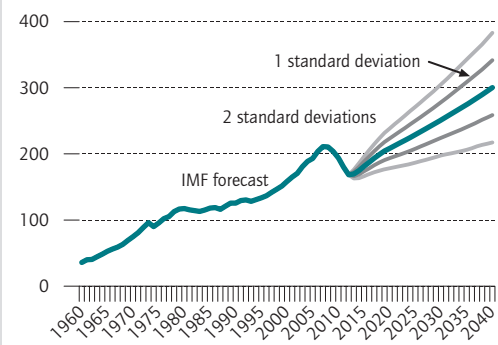
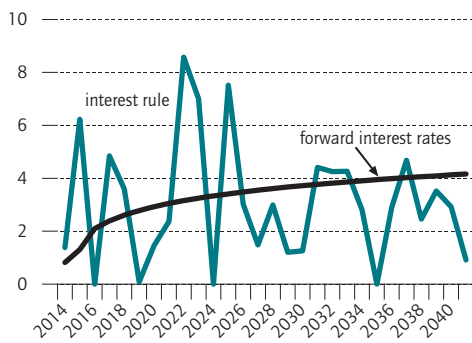*Sources: IMF; calculations by DIW Berlin.*

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selected so that differences from the status quo arising due to macroeconomic fluctuations in Greece are offset over the repayment period in expectation. In particular, interest payments on loans from the GLF have the same expected present values with and without indexation. However, payment differences may arise ex post, i.e. after the end of the repayment period. This is the case if the overall growth of the Greek economy is on average weaker or stronger than predicted by the IMF forecast, and consequently the interest payments differ. Figure 3 shows the distribution of the present value differentials. The mean deviation is 3.77 billion euros; a maximum shortfall in a worst case scenario is reached at a differential in interest payments of just under nine billion euros.

Finally, it is assumed that indexation only affects a share of the overall outstanding debt level. Specifically, this proportion is fixed at the sum of GLF loans in relation to Greece's overall debt level.

The debt limit is numerically determined through simulation of the model in an iterative process. The debt limit is based on the arbitrage-free condition of a risk-neutral investor. In particular, the debt limit is fixed at a default probability at which a hypothetical

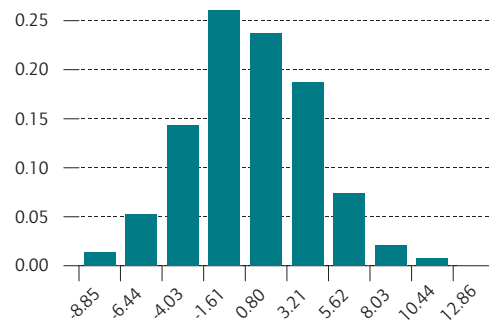Figure 2

Illustration of the Interest Rule
In percent

Sources: Thomson Reuters Datastream; calculations by DIW Berlin.

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Figure 3

Probability Distribution of the Present Value Differential
In percent

Source: calculations by DIW Berlin.

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Greek government bond with a coupon of 4.95 percent would be purchased at par by an investor. This corresponds to approximately the coupon rate of the latest Greek bond issuance.[2] If the debt level reaches the debt limit, restructuring of all outstanding debts is assumed with a recovery rate of 25 percent.

In order to determine the effect of the interest savings on the economic cycle, the interest rate differences from the status quo ($\Delta_t^{(i)}$) need to be calculated. These are added to nominal GDP using a multiplier of one:

$$Y_t = Y_{t-1} \times g_t + \Delta_t^{(i)}$$

Thus, it is possible to determine the smoothing effect on the growth rate from the modified GDP series.

In the final stage, the repayment profiles of a ten-year bond and of the GLF loans are calculated over all simulation paths. Debt payments are determined on the basis of the simulated debt levels and growth rates using the interest rule described above. The default rates are obtained simultaneously. Specifically, once the debt limit has been reached along a simulation path, it is assumed that a default takes place and that the recovery value is paid out to international investors.. In this case, all remaining interest and principal payments are repudiated.. For the sake of comparability, the present values of all repayment profiles generated are calculated so that the distribution function across all simulations can be mapped out. Furthermore, it is possible to vary the share of total debt made up of GDP-linked debts, thus allowing the effects of indexation to be calculated for different debt compositions.

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2   Thus, the default probability of a risk-neutral investor's Greek bonds is extrapolated from the market price on the assumption that this investor uses an identical model to the one described here for evaluating the default risk.

sequently, fiscal policy is more countercyclical and contributes to smoother growth rates. This is particularly important for countries, such as Greece, which may lose access to the capital market and are therefore compelled to follow a procyclical fiscal policy—for instance, a debt consolidation during recessions.

The second advantage is that GDP-linked loans reduce the risk of sovereign default. Should growth be unexpectedly weak, interest payments would automatically be reduced. This in turn would reduce the probability of default. If the reverse happens, however, interest would increase, so that in expectations there is no loss of interest for creditors. The decreased likelihood of Greek government insolvency would also have a positive effect on newly issued debt as the associated default risk would also be reduced. This should lower the returns on Greek government bonds and thus continue to make a positive contribution to solvency.

From a political economy point of view, too, a flexible interest mechanism would have its advantages. It would eliminate the need, if growth forecasts prove to be incorrect, to enter into renewed drawn-out and widely unpopular political negotiations on further loan concessions. Moreover, a commited reduction of the debt burden in times of economic downturn might help remove barriers to reform.[10] From the creditors' perspective, indexation should also be more attractive than simply giving the money to the Greek government, in the form of even lower interest rates, for instance, since indexation includes the possibility of higher returns on existing loans.

There are also disadvantages, however. Above all, creditors would be faced with a higher level of uncertainty about future interest payments[11] which might prompt them to demand a risk premium for increased uncertainty.

Another disadvantage discussed in the literature is a possible moral hazard.[12] Greece might be tempted to deliberately reduce growth so as to avoid higher interest payments. However, simulations conducted as part of the present study show that for every one percentage point of additional growth, only one-fifth flows out to the creditors in the form of higher interest. Therefore, there would be no incentive to intentionally suppress growth.

Impact of Interest Rate Indexation on GLF Loans

The effects of indexing interest payments on Greek public finances are quantified in the following sections using a macroeconomic simulation model (see box). In particular, the model shows the impact of GDP-linked loans on cyclical fluctuations, on the probability of loan defaults, and on the level of the debt-to-GDP ratio.

Stabilizing the Economic Cycle

In case of GDP-linked interest payments, the current deficit is lowered during a recession compared to the case without indexation due to saved interest payments. As a result, lower primary surpluses would be sufficient to service the outstanding debt. A tax hike to make up for lower revenues during recessions could thus—at least to some extent—be avoided. The burden on the economy would automatically be alleviated, thus easing the recession. An economic upturn would produce the opposite effect. Then the Greek government would pay higher interest due to the indexation which would reduce public demand and thus have a dampening effect on the economy.

Figure 6 illustrates the stabilizing effect of the government adopting a more countercyclical spending policy, using an example for the interest rate under stochastic growth. Overall, the volatility of the GDP growth rate is reduced by around 20 percent in the model (see Table 1). This shows that an instrument of this type can already significantly attenuate the macroeconomic fluctuations in Greece when applied only to loans from the GLF. If the interest payments on loans for a possible third financial support program were also indexed, this effect would increase to an overall reduction of macroeconomic volatility of 23 percent.

Reducing the Probability of Default

If the growth of the Greek economy should be lower than predicted in the IMF forecast, there would be the threat of another debt restructuring in the medium term. If this risk of a partial default is taken into account, it becomes evident that indexing the interest payments would significantly lower the probability of a debt restructuring. The economic intuition for this result can be explained by the following mechanism: If growth is lower

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10 A. Mourmouras and W. Mayer, "Overcoming barriers to reform: On incentive-compatible international assistance," IMF Working Paper WP/07/231 (2007).

11 For practical reasons, this volatility in payments during the repayment period should be taken into account in the national budget of a creditor country by means of a fund which would have to be set up specifically for this purpose.

12 E. Borensztein and P. Mauro, "The case for GDP-indexed bonds," Economic Policy (2004): 165–216.

Figure 6

Growth Rates of Greece's GDP
In percent
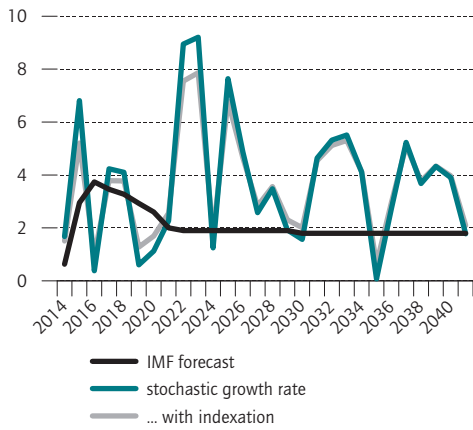
Sources: IMF; calculations by DIW Berlin.

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The economic cycle could be stabilized with indexed loans.

Table 1

Stabilization from Indexation of Greek Loans
In percent or percentage points

	Fluctuations in GDP[1]	Change due to indexation
Without indexation	2.1	–
Indexation of GLF loans	1.7	−19
Including third bailout[2]	1.6	−23

1 Measured as standard deviation of the growth rate in percentage points.
2 Third financial support program as a 12-billion-euro loan.
Source: calculations by DIW Berlin.

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GDP-linked loans reduce macroeconomic volatility.

than assumed in the IMF forecast, this may result in an increase in the debt ratio. This increase would be lower if interest payments were tied to the growth rate. Therefore, it is less likely that the debt limit at which there would be a partial payment default would be reached. Since all outstanding public debt is usually affected if sovereign debt is restructured, all creditors would benefit from an indexation of GLF loans. Thus, the Greek government would also profit from increased solvency ex ante, since its financing costs on capital markets would fall.

For the model calculation on the probability of default, it is assumed that 82 percent of funding for Greece is from non-GDP-linked loans, while the interest on the

Figure 7

Probability Distribution of Present Values with Loan Indexation
In Prozent

Interest payments as percentage of status quo
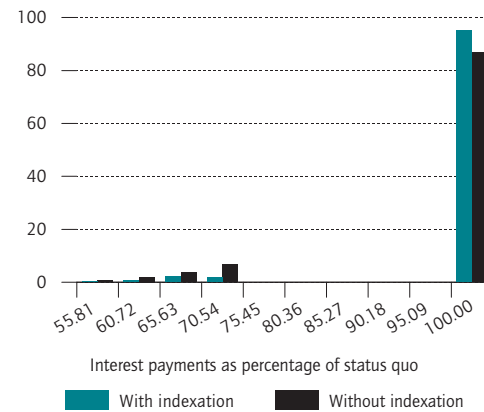
Source: calculations by DIW Berlin.

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Default probability could be significantly reduced if loans were partly indexed.

GLF, which makes up the remaining 18 percent, is tied to the growth rate.[13] In order to simplify the calculation, it is assumed that the maturity of all loans is ten years.

The present value of non-GDP-linked loans—if these are repaid—can be determined by a single value, since the flow of payments in the model is not subject to interest rate fluctuations (see Figure 7). Full repayment of the loans will be achieved without indexation in 87 percent of cases; there will be a debt restructuring before maturity of the ten-year repayment period in around 13 percent of cases. Indexing loans from the GLF increases the probability of full repayment by just under eight percentage points up to 95 percent (see Table 2). It would increase by another percentage point if the loans of a third financial program were also indexed. Furthermore, the simulation of the interest payments on an indexed loan shows that payments might be even higher in the event of positive economic development than in the status quo (see Figure 8).

Stabilizing the Debt Ratio

The objective agreed by the troika and Greece to reduce the debt ratio to around 128 percent of GDP by 2020 can only be achieved if the course of the Greek economy is

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13 The percentage of indexation from GLF loans is calculated as the quotient of the amount of the loans from the GLF (52.9 billion euros) and Greece's total debt (302 billion euros). This corresponds to 18 percent.

Table 2

Default Rates of Greek Loans
In percent

|	Probability of default	Change due to indexation
Without indexation	13.4	–
Indexation of GLF loans	5.5	−59
Including third program[1]	4.2	−69

1 Third program as 12-billion-euro loan.
Source: calculations by DIW Berlin.

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GDP-linked loans reduce the probability of default.

Figure 8

Probability Distribution of Present Values of Simulated Repayment Profiles
In percent

Interest payments as percentage of status quo
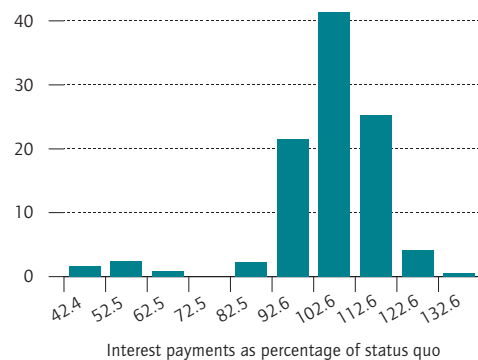
Source: calculations by DIW Berlin.

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Indexation of loans might also provide opportunities for higher interest payments.

as favorable as assumed in the IMF forecast. The question therefore arises as to how the debt ratio would develop with a lower rate of economic growth in the short and medium term.

In an attempt to answer this question, two scenarios have been added to the IMF forecast (see Figure 9). In the pessimistic scenario, the growth rate is significantly weaker, particularly in the years up until 2019. In the optimis-

Figure 9

Scenarios for Greece's GDP
In percent
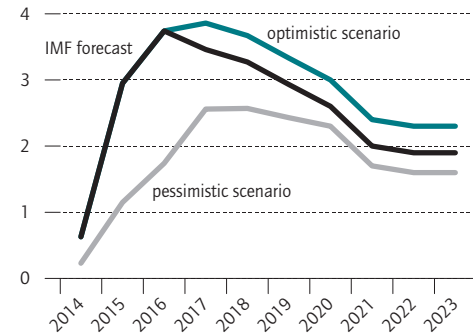
Source: calculations by DIW Berlin.

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The growth rate would be much weaker in the pessimistic scenario, particularly up to 2019.

tic forecast, growth of the economy from 2017 onwards is somewhat more dynamic than in the IMF forecast.[14]

It turns out from the simulations that the troika's objective will not be achieved in the pessimistic scenario without indexation (see Figure 10).[15] Indexation, on the other hand, would bring them closer to their goal since the credit terms are automatically adjusted to economic development, although the effect is modest. Conversely, the course of the debt ratio in the optimistic scenario shows that the additional interest payments would not be particularly significant if the IMF's growth forecast is surpassed in the optimistic scenario with higher growth rates than in the baseline forecast of the IMF. Hence, even in this case Greece would not be in a disproportionately worse position than under the credit terms in the status quo.

Conclusion

There are four advantages to linking interest payments for public loans to Greece with Greek economic performance as proposed here. First, GDP-linked loans would reduce the probability of a further Greek debt restructuring by becoming insolvent. As a result, also the default risk for the German tax payer is reduced. In par-

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14 All other assumptions made in the IMF forecast remain unchanged, particularly the positive development of primary surpluses.

15 The simulation of the debt level adopts the other assumptions made by the IMF, particularly the development of primary surplus.

ticular, the objective of stabilizing the Greek debt ratio could be achieved, even in weaker growth scenarios. Consequently, GDP-linked loans could make a contribution to the sustainability of Greek debt.

A second advantage of GDP-linked loans is that they would provide stronger incentives for Greece to assume responsibility for its own reforms, thus improving the chances of success. Short-term downturns would not lead to a politically costly renegotiation of credit terms but could be bridged by automatically temporarily relaxing the credit terms. As this is known ex ante, the resulting insurance effect for Greek policymakers would then further reduce the current political-economy barriers to reforms. Consequently, European creditors would have access to a financing structure that contributes to improve burden-sharing and is more incentive compatible than the existing non-contingent debt. Thus, the political conflict between Greece and the other euro area countries would be reduced. The troika, which is being increasingly criticized throughout Europe, would no longer have to play the dubious role of "financial inspector."

A third advantage is that GDP-linked loans would ease the burden on the Greek government in the short to medium terms through a deferral (not waiving) of interest payments if the recovery will be delayed, reduce the obligation to pursue a procyclical fiscal policy, and thus contribute to macroeconomic stabilization.

Finally, Germany and the other euro area member states would also benefit from this option. Not only would the credit risk for the German government be reduced, but in the long term, loan repayments could be higher if the Greek economy recovers more strongly and grows again. These benefits have to be contrasted with the fact that GDP-linked loans make interest payments less predictable.

For all these reasons, the instrument of GDP-linked loans is a better option—from both a European and a German perspective—than that favored by the Greek government, i.e., cutting interest rates and extending the loan terms, which would de facto amount to another public debt restructuring.

Figure 10

Simulated Development of Greece's Debt
In percentage of GDP
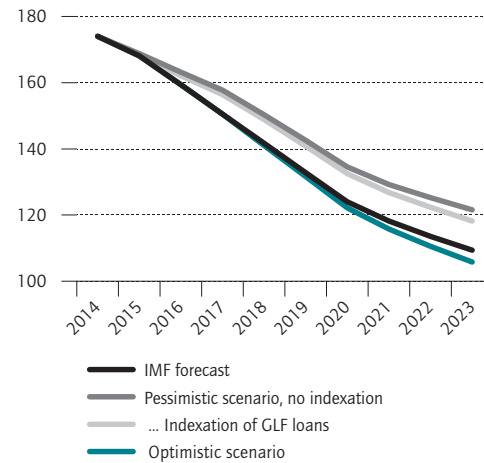
Source: calculations by DIW Berlin.

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In the event of weak growth, the Greek debt level could be better stabilized by means of indexation.

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