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# Parity Funding of Health Care Contributions in Germany: A DSGE Perspective

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## Abstract

Germany reintroduced parity funding of the statutory health insurance scheme in January 2019 by lowering the contribution rates for employees and raising those for employers, leaving the total rate constant. This reduces the tax wedge between total labour costs and net wages. After a small demand impulse on impact, followed by a small downturn in the first two years after implementation, an estimated New Keynesian DSGE model indicates small positive long-run output and employment effects. However, the reduced tax wedge leads to lower public revenues. Aggregate macroeconomic and welfare effects will depend on how the government compensates for these revenue losses.

*Keywords:* tax incidence, social security contributions, DSGE modeling, macroeconomics (JEL: E32, E24, F41)

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## 1. Introduction

The German government reintroduced parity funding of the statutory health insurance scheme in January 2019 by lowering the contribution rates for employees and raising those for employers by the same percentage points. As could be expected, this is mostly welcomed by labour unions and criticised by employers' federations. Basic economic theory suggests that a pure shift of contribution rates between employees and employers (i.e. changing the legal incidence of these contributions) does not change their economic incidence and, therefore, does not generate long-run employment effects. This result, however, is only valid for a constant tax wedge. The proposed shift of tax incidence keeps the total tax rate constant but reduces the tax wedge such that, in the end, the equilibrium gross wage falls. Hence, we find that the reform can generate positive long-run effects.

This paper analyses the reform within a three-region New Keynesian DSGE model estimated for Germany, the rest of the euro area and the rest of the world. Using an

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estimated DSGE model has several advantages. First, it allows us to quantify the effects of reintroducing parity financing in Germany. Second, with such a framework, we can derive insights going beyond the (partial-equilibrium) impact of such a reform on employment only. Third, we are not only able to perform a comparative static analysis but can also assess the transition from the initial to the new steady state. Fourth, the international dimension of the model allows us to address the impact of the reform on international competitiveness. Last, we are able to derive a model-consistent welfare measure to identify under which circumstances and to which extent which group in the economy gains or loses after this reform.

We find that, also because of the resulting lower gross wage, a one-to-one shift of contribution rates from employees to employers raises employers' labour costs by a smaller percentage than the employees' net wages. This reduces the labour tax wedge, even though the total contribution rate (i.e. the sum of the employer and employee contribution rate) remains constant, which we show formally below. A lower labour tax wedge can generate positive macroeconomic effects because higher real disposable income eventually increases private consumption, employment, and private investment. Labour costs first increase as a result of the tax hike on the employer's side. But they start falling eventually. This happens for two reasons. First, because of the reduced contribution rate for employees, workers are willing to lower their gross wage demands (as the net wage has risen). Second, they accept lower gross wages as a result of the higher contribution rate for employers to mitigate the decline in labour demand. International competitiveness of Germany vis-a-vis the rest of the Euro area follows the pattern of labour costs. On aggregate, all these effects are small, however.

Finding positive long-run effects of reintroducing parity funding may, at first sight, conflict with the "most basic theorem of public finance: the irrelevance of the side of the market on which a tax is levied" (Blinder, 1988). The literature has coined this theorem, namely that the economic incidence of a tax is independent of its legal incidence, the "irrelevance theorem" or the "invariance of incidence proposition" (Kotlikoff and Summers, 1987; OECD, 1990; Goerke, 2002; Rosen and Gayer, 2014; Stiglitz and Rosengard, 2015). In the model employed in this paper, this irrelevance theorem also holds. In order to resolve the *prima facie* contradiction, it is key to understand that, since health insurance contributions are *ad valorem* taxes, the tax wedge and hence the effective total tax incidence changes. This changes the equilibrium gross wage. The "invariance of incidence proposition" does hence not apply to the analyzed reform. It is the tax wedge that determines the economic incidence and the effective burden of social security contributions and labour taxes (see also Goerke, 2002, chapter 6.2).<sup>1</sup> Importantly, the reintroduction of equal funding of health care contributions leaves the overall contribution rate unchanged, but reduces the ratio between total labour costs and net wages. It therefore reduces the effective tax burden. By the same token, abandoning parity funding in

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<sup>1</sup>Indeed simulating a tax shift that leaves the tax wedge constant in our model does not affect GDP and employment in the long run.

Germany in 2005 by shifting part of the contribution rate from employers to employees led to an increase of the relevant labour tax wedge and, therefore, augmented the effective tax burden (German Council of Economic Experts, 2004, Box 18).

While the reintroduction of parity funding of the statutory health insurance scheme is budget-neutral ex-ante, it is not ex-post (i.e., after the private sector's adjustment to the tax change). As the reform triggers a permanent decline in gross wages, which are the base for taxes and (other) social security contributions, it lowers public revenues in the long run.<sup>2</sup> Hence, the government must adopt additional measures to offset these losses in order to stabilise public debt in the long run.

We exploit the model's rich fiscal structure to analyse how the results depend on the fiscal instrument the government chooses to compensate for these losses. In our baseline simulation, we assume that a lump-sum tax levied only on non-liquidity-constrained consumers (so as to avoid any additional distortions in the system) is used to offset these losses. In this case, an assumed lowering of employees' social security contributions by 0.5 percentage points, given a simultaneous and matching increase in the employer contribution rate, boosts GDP relative to its initial equilibrium value by 0.03% in the long term. While labour costs remain almost unchanged, the net compensation of employees increases by 0.28%. The structural unemployment rate falls slightly by 0.02 percentage points. Reducing transfers to all households generates the same macroeconomic effects, but the financing burden is shared between liquidity and non-liquidity-constrained households. If the government uses higher consumption taxes to compensate for the revenue losses, the positive macroeconomic effects are slightly smaller because the policy-induced increase in prices for consumption goods dampens positive demand effects. A reduction in public consumption to finance the revenue losses does essentially not affect long-run GDP. The reason is that higher aggregate private consumption is then offset by a fall in public consumption such that aggregate demand remains unchanged. When using labour income taxation to finance the revenue losses, macroeconomic effects are mildly negative.<sup>3</sup> These findings highlight the importance of operating in a general-equilibrium framework to analyse the macroeconomic effects of (reintroducing) parity funding. While the literature discussed above has focussed on the labour market effects, it has for the most part neglected the feedback on public revenues in general equilibrium.

The choice of the fiscal instrument used to compensate for the public revenue losses of the reform also determines who gains and who loses from parity funding. Generally, an increase in employment results in a utility loss in our model as providing labour is as-

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<sup>2</sup>In practice, these revenue losses not only affect the health care system, but all other revenue components depending on wage income, such as the unemployment insurance scheme, the pension and long-term care systems as well as public revenue from labour income taxation.

<sup>3</sup>Macroeconomic effects may also turn negative when capital taxes are increased or public investment is reduced, as a result of the distortions these fiscal instruments entail. This is due to a negative effect on the incentive to invest in physical capital, which in New Keynesian models create larger distortions than other fiscal instruments; see Kempkes and Stähler (2016) for a discussion.

sociated with disutility (a loss in leisure). It is, therefore, important whether this utility loss can be compensated for by a utility gain due to higher consumption. In our baseline simulation, where we use lump-sum taxes levied on non-liquidity-constrained households only, aggregate welfare indeed increases. However, while liquidity-constrained consumers benefit, non-liquidity-constrained households actually experience a utility loss. This is because they bear the full financing costs and cannot increase consumption sufficiently to offset the utility loss of less leisure. Increasing consumption taxation or reducing transfers to all households indeed alleviates this burden. But now, labour income of liquidity-constrained households does not rise sufficiently to offset the financing burden. Hence, even though aggregate welfare may increase, these two policies do not entail a Pareto improvement. This is different when using public consumption as the financing instrument. Even though this measure does not generate positive long-run GDP effects, it enables both household types to increase consumption. The reason is that lowering public consumption does not entail a policy-induced increase in private consumption costs nor does it cancel the labour income gain by increasing income taxes elsewhere.

These findings relate our paper also to the literature on budget-neutral labour tax wedge reductions in general equilibrium. In a New Keynesian model, Coenen et al. (2008) also find positive effects on output and employment after a reduction of the labour tax wedge financed by lump-sum taxes. Positive macroeconomic effects when using higher consumption taxation as financing instrument are found in Boscà et al. (2009, 2013), Engler et al. (2017), Gomes et al. (2016), Jacquinot et al. (2018), Langot et al. (2014), Lipinska and von Thadden (2009, 2013) and Stähler and Thomas (2012). Simulating a labour tax reduction financed by different fiscal instruments, Attinasi et al. (2019) confirm our finding that, while financing public revenue losses by lump-sum taxes or consumption taxation generates higher output gains, using public consumption as the financing instrument may be preferred in terms of welfare. These findings are in line with the general result that replacing a distorting tax by a non-distorting fiscal instrument is welfare-enhancing (see, among others, Golosov and Tsyvinski, 2011, Golosov et al., 2015, and Laczó and Rossi, 2018, for a further discussion).

The rest of the paper is organised as follows. In section 2, we explain the underlying economic mechanism formally and highlight the importance of using a general equilibrium framework to deal with the question. Section 3 describes the New Keynesian DSGE model that we use for our numerical exercise, which is presented in detail in section 4. A welfare assessment can be found in section 5. Section 6 concludes.

## **2. Building intuition**

In this section, we provide a very simplified model framework to build intuition for the numerical results presented below. The statutory health insurance scheme in Germany is financed by contributions paid from wages and salaries at a flat rate. Benefits from the scheme are the same for everyone. Contributions are split between employees

and employers.<sup>4</sup> Like the general contribution rate to the statutory health insurance scheme (currently 14.6%), the supplementary contribution rate (varying by insurance company and currently averaging 1.08%), which was paid by employees only before January 2019, will be divided equally between employees and employers. In addition, the scheme receives an annual transfer of the federal government, currently amounting to 14.5 billion Euro.<sup>5</sup>

In a standard model framework with a Walrasian labour market setup, household utility maximization equates the marginal rate of substitution between consumption and leisure,  $MRS_t$ , which equals the marginal disutility of working divided by the marginal utility of consumption, with the net wage:

$$(1 - \tau_t^w - \tau_t^{sc,w}) \cdot w_t = MRS_t, \quad (1)$$

where  $w_t$  is the gross wage,  $\tau_t^w$  the labour income tax rate and  $\tau_t^{sc,w}$  the contribution rate to the health care insurance scheme levied on workers. In that same model framework, profit maximization of firms equates the marginal product of labour,  $MPL_t$ , to total labour costs:

$$(1 + \tau_t^{sc,f}) \cdot w_t = MPL_t, \quad (2)$$

where  $\tau_t^{sc,f}$  the contribution rate to the health care insurance scheme levied on firms. An equilibrium in the labour market is given by

$$\frac{MPL_t}{(1 + \tau_t^{sc,f})} = w_t = \frac{MRS_t}{(1 - \tau_t^w - \tau_t^{sc,w})} \Rightarrow \frac{MPL_t}{MRS_t} = \frac{(1 + \tau_t^{sc,f})}{(1 - \tau_t^w - \tau_t^{sc,w})}. \quad (3)$$

The marginal product of labour is decreasing in employment ( $\partial MPL_t / \partial N_t < 0$ ), while the marginal rate of substitution between consumption and leisure is increasing in employment ( $\partial MRS_t / \partial N_t > 0$ ). If we increase the contribution rate  $\tau_t^{sc,f}$  and decrease the rate  $\tau_t^{sc,w}$  by the same amount (i.e. assume  $d\tau_t^{sc,f} = -d\tau_t^{sc,w}$ ), the right-hand side of equation (3), which represents the labour tax wedge, becomes smaller.<sup>6</sup> Hence, employment must increase (for the left-hand-side to fall, too). Intuitively, a reduction of the

<sup>4</sup>Only a small fraction of workers (with a wage income above a certain threshold) is able to opt out and buy private health care insurance. Currently, this holds for 10% of the population, including civil servants, with a falling trend (see <https://de.statista.com/statistik/daten/studie/155823/umfrage/gkv-pkv-mitglieder-und-versichertenzahl-im-vergleich/>).

<sup>5</sup>For further details, see [www.bundesgesundheitsministerium.de/finanzierung-gkv.html](http://www.bundesgesundheitsministerium.de/finanzierung-gkv.html).

<sup>6</sup>Differentiating the right-hand-side of equation (3) with respect to  $\tau_t^{sc,w}$  and  $\tau_t^{sc,f}$ , we get  $\frac{1}{(1 - \tau_t^w - \tau_t^{sc,w})} d\tau_t^{sc,f} + \frac{(1 + \tau_t^{sc,f})}{(1 - \tau_t^w - \tau_t^{sc,w})^2} d\tau_t^{sc,w}$ . When  $d\tau_t^{sc,w} = -d\tau_t^{sc,f}$ , this implies that  $\frac{1}{(1 - \tau_t^w - \tau_t^{sc,w})} \left[ 1 - \frac{(1 + \tau_t^{sc,f})}{(1 - \tau_t^w - \tau_t^{sc,w})} \right] d\tau_t^{sc,f} = -\frac{(\tau_t^w + \tau_t^{sc,w} + \tau_t^{sc,f})}{(1 - \tau_t^w - \tau_t^{sc,w})^2} d\tau_t^{sc,f} < 0$ .

employees' social security contribution rate accompanied by a simultaneous increase in the employers' social security contribution rate by the same percentage points *decreases* the tax wedge (independent of  $\tau^w$ ). This fosters employment and generates positive macroeconomic effects in partial equilibrium.<sup>7</sup>

It is straightforward to verify by equation (2) that this unambiguously decreases gross wages  $w_t$  and, thereby, contribution-based revenues  $(\tau_t^{sc,w} + \tau_t^{sc,f}) \cdot w_t$  given that  $d\tau_t^{sc,f} + d\tau_t^{sc,w} = 0$ . Hence, while the reform is budget neutral ex ante, it is not ex post. If health care (or other) expenditures are not to decline in response to the reform, federal transfers (or the general contribution rate) must be increased. Higher federal transfers, however, have to be financed by the federal budget. This, in turn, tends to have negative economic effects in general equilibrium (at least in the long run). As we will see in the next section, the re-introduction of parity funding in the health care system can generate small positive effects if the loss in contribution-related revenues is financed by higher consumption taxation and/or a cut in general government expenditures or transfers. Welfare effects will depend on the exact instrument used.

### 3. The general equilibrium model environment

Our general equilibrium world is described by an estimated New Keynesian DSGE model called GEAR. A detailed formal description can be found in the appendix and in Gadatsch et al. (2016). Here, we give only a non-formal overview of the model. Overall, it is quite a prototypical New Keynesian DSGE model comprising three regions. Two of them (Germany and the rest of the eurozone) form a monetary union, jointly representing an open economy. The model is estimated using Bayesian methods.

Germany and the rest of the euro area essentially display the same economic structure. Households optimise their consumption, savings and labour supply decisions. There are no durable goods. Some households are liquidity-constrained and are thus compelled to consume their entire income in each period as in Galí et al. (2007). Involuntary unemployment exists if aggregate labour supply exceeds the labour demand following Galí (2010) and Galí et al. (2011). However, each household type pools its income in line with Andolfatto (1996) and Merz (1995) such that there is no ex-post household heterogeneity. Households enjoy some monopoly power on the labour market as different types of labour are needed in production, and these are not perfectly substitutable. Wage setting is associated with Rotemberg adjustment costs in the sense that changing nominal wages is costly for firms and for workers (see Ascari et al., 2011, and Ascari and Rossi, 2011, for a discussion). For simplicity, we abstract from human capital accumulation decisions.

Labour and capital are the factor inputs for the manufacture of goods. The production side is characterised by monopolistic competition including nominal and real

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<sup>7</sup>Note that this would be different for quantity taxes, in contrast to ad valorem taxes. The tax wedge would remain constant in this case.

frictions in line with Christiano et al. (2005, 2011). Firms produce with Cobb-Douglas technology. Taxes and levies comprise consumption, wage and capital taxes as well as social security contributions. They distort supply and demand decisions as well as savings decisions by ultimately reducing net earnings or net interest income (and therefore potentially increasing financing costs). Fiscal expenditure components are transfers (including unemployment benefit payments), government consumption, which also contains wage payments to employees in the public sector following Forni et al. (2009), and government investment. The provision of government employment and government capital has a positive (multiplicative) impact on private production as in Pappa (2009), Leeper et al. (2009, 2010), Stähler and Thomas (2012) or Coenen et al. (2013). The fiscal instruments react to debt (being more restrictive, the higher it is) and to the business cycle (in an accommodative manner or restrictively depending on the fiscal instrument and the estimated parameters) in accordance with an estimated fiscal reaction function along the lines of Schmitt-Grohé and Uribe (2007). The public sector can borrow to balance its overall budget. It has to pay interest, which corresponds to the nominal interest rate for the euro area as a whole (thus abstracting from country-specific risk premiums). This rate of interest is set by the monetary authority in accordance with a Taylor rule for the monetary union as a whole (see, among others, Christoffel et al., 2008). Furthermore, the trade flows of goods and assets between the regions are modelled endogenously. Developments in the third country (the rest of the world) are given exogenously for the euro area as in Christiano et al. (2011).

The various social security schemes that exist in reality are not explicitly captured in the model. Instead, the model contains a consolidated government budget constraint for each region, in which the social security contributions by employers and employees add to public revenues. In this context, the social security contributions have the character of a tax and are not based on the equivalence principle. This assumption applies to the statutory health insurance scheme, but not to the unemployment insurance scheme.

In our baseline scenario, deficits or surpluses resulting from the change in social security contribution rates are financed by a change in lump-sum taxes in order to guarantee a constant debt-to-GDP ratio in the long run following the typical fiscal reaction function. These lump-sum taxes are collected only from non-liquidity-constrained households and therefore create no distortions in the economy. The model can be used flexibly to analyse other financing instruments, such as consumption or investment income taxation, transfers to all households, or changing government consumption or investment. Since different financing instruments vary in the degree of aggregate distortion they impose, the resulting macroeconomic effects of the return to parity funding of the statutory health insurance scheme will depend on the choice of the financing instrument. Below we compare the results of our baseline scenario with the simulation results of using alternative financing instruments, also with respect to their welfare implications.



#### 4. Numerical simulation results

This section describes the simulation design and the numerical simulation results. It is followed by a more in-depth examination of the underlying economic mechanism, which is responsible for the positive long-run macroeconomic effects stemming from the redistribution of employees' to employers' contributions to the statutory health insurance scheme.

**Simulation design:** Parity funding of the health insurance scheme without changing the overall contributions rate requires lowering the employees' social security contribution rate by 0.5 percentage points and increasing the employers' contribution rate by the same percentage points. These changes are simulated as a permanent change that occurs unexpectedly.<sup>8</sup> We use lump-sum taxes to compensate for public revenue losses in our baseline simulation in the main text. Showing transition paths when using other financing instruments is relegated to the appendix.

For simplicity, we assume that, at the time of the fiscal change, the economy is in its initial steady state and that there are no future shocks in the economy after the change in tax policy. This allows us to isolate the effects of the return to parity funding from other shocks. Simulations are performed in a non-linear manner under the assumption of rational expectations. Results for the transitional dynamics are summarized in Figure 1 and the long-run effects are shown in Table 1.

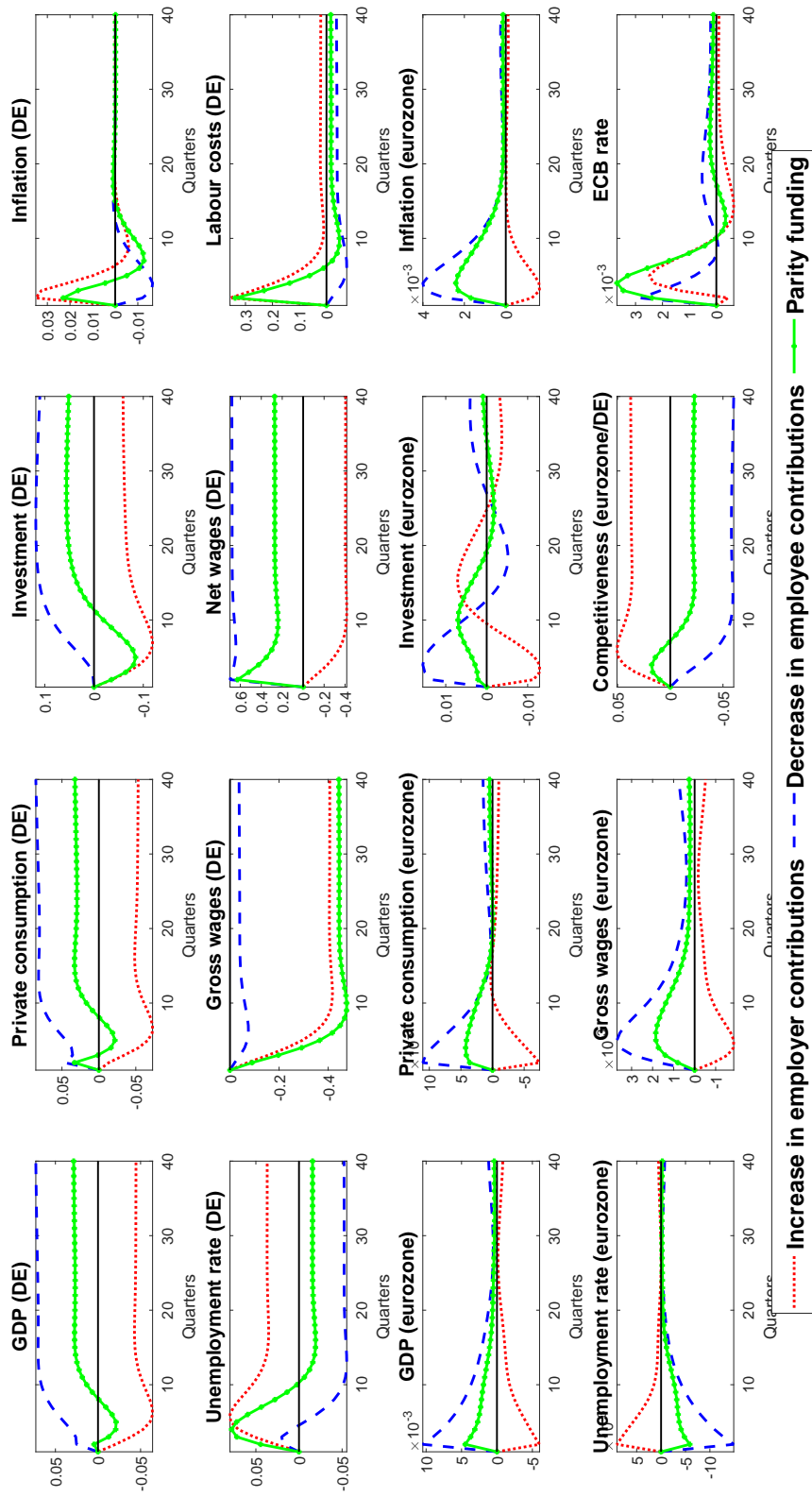
**Simulation results:** Taken by itself, the reduction in the contribution rate for employees initially leads to an increase in the net wage and therefore in households' willingness to participate in the labour market (the labour supply increases). Simultaneously, employees demand lower gross wages, as net wages and not gross wages are the compensation for their disutility of work. Lower gross wage demands lead to a slight reduction in labour costs and thus to an increase in the demand for labour. The resulting increase in employment, however, is not large enough to undo the initial decline in gross wages and in labour costs. Prices can thus be lowered through the marginal cost channel with Germany's international price competitiveness (i.e. foreign producer prices relative to domestic producer prices) rising slightly as a result. The spillovers to the rest of the euro area are nevertheless positive, as the positive impact on import demand for foreign goods due to higher aggregate demand in Germany dominates.

Raising the contribution rate for employers in isolation leads to an increase in the cost of labour, which lowers labour demand and gross wages. This, however, cannot offset the increase in labour costs stemming from the higher contribution rate paid by employers. Overall, this produces analogous opposite developments to those when the employees' contribution rate is lowered.

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<sup>8</sup>Anticipation (as the change was announced in 2018 already) and the current monetary stance do not affect our results much, which we verify in the appendix.

Figure 1: Adjustment paths given changes in the contribution rate



The total effect of reintroducing parity funding depends on which of the two previously described channels is stronger. As can be seen from Table 1, the positive macroeconomic effects dominate slightly in the long run, which is a robust result in the GEAR model. The economic mechanism is described in more detail in the following section. In the new long-run equilibrium, households' net wages rise by 0.28%, while compensation of employees (gross wage including employer social security contributions) fall slightly by 0.01% (see Table 1). The unemployment rate declines by 0.02%-points, and GDP rises by 0.03%. The higher net wage boosts private consumption. Since an increase in employment raises the marginal product of capital, investment also increases and output becomes more capital-intensive overall, reflecting the fact that the tax burden on labour relative to capital is lowered by the reform.

The sequence of short to medium-term effects can be roughly subdivided into three periods (see Figure 1). On impact, the positive net income effect dominates on the side of households. Net wages rise, increasing demand especially on the part of liquidity-constrained households, and GDP increases. The higher unemployment rate is explained by the increased labour market participation. During the following two years, however, the negative effects implied by the higher labour costs dominate. The direct increase in employers' costs leads to a reduction in employment, unemployment goes up further, and households' gross wages as well as individual net income falls (the latter remains higher than in the initial equilibrium, but the positive effect is diminished). Altogether, this has negative effects on consumption demand and GDP over the medium run. Inflation is initially higher, but somewhat lower in the medium run. Due to wage adjustment costs (reflecting staggered wage bargaining processes in the model), it takes two to three years until the gross wage has roughly reached its new equilibrium level. Labour costs fall below their initial level despite the increase in the employers' social security contribution rate, and employment and GDP are eventually higher than before.

Inspecting the differences between the alternative financing instruments to offset long-run revenue losses for the governments, we observe the following (see Table 1). Using lump-sum taxes or transfers to all households generates the most favorable output effects. This is because these measures imply the largest increase in aggregate demand (given that a non-distortive tax substitutes a distortive one). They are followed by the use of higher consumption taxes as financing instrument. Here, the positive demand effects are suppressed because of a policy-induced increase of consumer prices. In terms of GDP, reducing public consumption has the least favorable effects. Even though private consumption demand increases most in this scenario, the output effects of reduced public consumption cannot be offset.<sup>9</sup> Using labour income taxes to finance the revenue losses resulting from parity funding offsets positive effects from reduced

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<sup>9</sup>Note that, in the GEAR model, it is assumed that public consumption entails a full home bias following Brulhart and Trionfetti (2004) and Trionfetti (2000), while part of private consumption is spent abroad. The negative domestic GDP effect of reduced public consumption would be smaller if the home bias was lower. In this case, positive spillovers to the rest of the eurozone, however, would also be reduced.

employee contribution rates and generates small negative macroeconomic losses.<sup>10</sup> The ranking of financing instruments also applies regarding employment and unemployment, respectively.

Table 1: Long-run effects of changes in the contribution rate

Variable	Financing instrument				
	Consumption tax	Transfers	Public consumption	Lump-sum taxes	Labour taxes
<i>...in Germany</i>					
GDP	0.02	0.03	0.00	0.03	-0.007
Private consumption	0.03	0.04	0.13	0.04	-0.003
...of optimisers	0.03	0.11	0.11	-0.01	-0.002
...of liquidity-constrained	0.03	-0.16	0.17	0.15	-0.003
Investment	0.03	0.04	0.00	0.04	-0.003
Unemployment rate	-0.02	-0.02	-0.01	-0.02	0.010
Real gross wages	-0.44	-0.44	-0.46	-0.44	-0.424
Real net wages	0.28	0.28	0.25	0.28	-0.063
Real labour costs	-0.01	-0.01	-0.01	-0.01	0.003
Employee contribution rate	-0.50	-0.50	-0.50	-0.50	-0.500
Employer contribution rate	0.50	0.50	0.50	0.50	0.500
Financing instrument	0.13	-0.47	-0.09	0.11	0.248
<i>...in eurozone</i>					
GDP	0.001	0.002	0.003	0.001	0.000
Private consumption	0.001	0.004	-0.002	0.001	0.000

*Note:* Table shows long-run changes of selected variables relative to initial steady-state values in percent (percentage points for rates and ratios). Financing instrument is expressed in percent (percentage point) deviations from its initial steady state (for tax rates and government-consumption-to-GDP ratio).

## 5. Welfare

We now turn to analysing the welfare implications of the return to parity funding of the statutory health insurance scheme. While being able to increase consumption in the new long-run equilibrium under most scenarios described above, households also need to provide more labour, which creates disutility. Furthermore, reintroducing parity funding creates small recessionary effects in the medium term. The welfare implications of the planned reform are hence not straightforward.

To evaluate welfare effects, we compute the life-time consumption-equivalent gain of each type of household as a result of the change in fiscal policy (Lucas, 2003). We will take into account the welfare difference between the initial and the final steady state as well as the transition thereto. More precisely, we calculate the consumption-equivalent

<sup>10</sup>In terms of the simplified model presented in section 2, the labour tax wedge actually increases due to the change in  $\tau_t^w$ .

welfare gain,  $ce^i$ , such that

$$\sum_{t=0}^{\infty} (\beta^i)^t U((1 + ce^i)\bar{c}^i, \bar{N}^i) = \sum_{t=0}^{\infty} (\beta^i)^t U(c_t^i, N_t^i),$$

where the exact utility function  $U(\cdot)$  is given by the corresponding equation in the appendix. Utility positively depends on the level of consumption,  $c_t^i$ , and negatively on  $N_t^i$ , the amount of labour provided (which measures forgone leisure). The bar indicates initial steady-state values. Hence,  $ce^i$  represents the amount of initial steady-state consumption a household of type  $i = o, r$  is willing to give up in a scenario with the policy change. Economy-wide welfare is computed as  $ce^{tot} = (1 - \mu)ce^o + \mu ce^r$ . The results are summarized in Table 2. Positive values imply a welfare gain, while negative values signal a welfare loss. Note that, as  $ce^i$  takes into account the transitional dynamics to the new steady state, we also report “pure” steady-state welfare changes in brackets (ignoring transitional dynamics).

Table 2: Welfare assessment

Financing measure	Consumption equivalents		
	Non-liquidity-constrained households	Liquidity-constrained households	Economy-wide
Lump-sum tax	-0.025 (-0.048)	0.058 (0.109)	-0.002 (-0.004)
Consumption tax	-0.002 (-0.003)	-0.001 (-0.001)	-0.001 (-0.002)
Public consumption	0.020 (0.037)	0.046 (0.088)	0.027 (0.052)
Transfers	0.038 (0.073)	-0.103 (-0.197)	-0.002 (-0.003)
Labour income tax	0.0005 (0.001)	0.0002 (0.0002)	0.0004 (0.0008)

*Note:* Welfare presented as life-time consumption equivalents taking into account the transition. In brackets, we report a pure steady-state comparison.

When taking into account the transition to the new steady state, welfare gains (losses) are smaller (larger) compared to a pure steady-state comparison (ultimately a comparative static analysis). This results from the recessionary effects in the medium run. Independent of these recessionary effects, financing instruments that generate the largest positive GDP effects (lump-sum taxes and transfers) do not lead to a Pareto improvement because at least on household type faces welfare losses. Using higher consumption taxation to offset public revenue losses after reintroducing parity funding actually generates small aggregate welfare losses, and losses for both household types. Only the decrease in public consumption or the increase in labour income taxes is able to produce welfare gains for both household types (and this holds even though these measure generate the smallest positive or even negative GDP effects).

The choice of the fiscal instrument to offset the revenue losses from reintroducing parity funding influences how consumption gains are distributed among household types (see Table 1). Not surprisingly, non-liquidity-constrained households face consumption losses whenever they have to bear the entire financing costs. That is the case when lump-sum taxes are used. The opposite holds when transfers to all households

are cut. In this case, the gain in labour income is not sufficient to offset the reduction in transfers they get from the government. Non-liquidity-constrained households are still able to increase consumption in this case because, by assumption, they are the owners of the firms and, thus, benefit from profits resulting from increased output. This also explains why the loss of non-liquidity-constrained consumers is significantly lower when using lump-sum taxes compared to the loss of liquidity-constrained consumers when using transfers. Both household types are equally affected by an increase in consumption taxes and manage to increase private consumption slightly. However, the welfare gain is not sufficient to compensate the welfare loss from foregone leisure. The largest increase in private consumption can be observed when reducing public consumption. This holds for both household types. As the welfare loss from providing more labour is more or less the same across scenarios (it is even lowest when reducing public consumption due to long-run output not being affected), it is natural that this latter financing instrument is the one that should be preferred in terms of welfare. Small positive welfare effects when using the labour income tax rate as a financing instrument can be explained by the fact that, then, the consumption loss is relatively small, compared to employment losses. In this case, the utility gain from more leisure overcompensates the loss from less consumption from the perspective of our model.

## 6. Conclusions

Using the New Keynesian DSGE model GEAR, this paper shows that the German Federal Government's decision to reintroduce parity funding of the statutory health insurance scheme from January 2019 on by lowering the contribution rates for employees by 0.5 percentage point and raising those for employers by the same percentage points will generate positive macroeconomic effects in the long run. This is due to the fact that the labour tax wedge actually declines. Because a lower tax wedge implies a fall in gross wages, which are the base for labour income taxes and all social security contributions, this measure is budget-neutral only ex ante but not ex post. Without compensating measures, public revenues eventually fall. The welfare implication of the planned reform will ultimately depend on the choice of the financing instrument to keep government debt stable. Reducing public consumption to offset the fall in revenues generates the highest welfare gains. All other measures either reduce aggregate welfare and/or increase welfare of one household type only at the expense of the other household type in the economy.

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