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

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Abstract

Germany will reintroduce parity funding of the statutory health insurance scheme in 2019 by lowering the contribution rates for employees and raising those for employers. This reduces the wedge taxes drive in between the marginal product and the disutility of labour. 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 and individual 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)

1. Introduction

The German government is planning to reintroduce 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.[1] As could be expected, this is mostly welcomed by labour unions and criticised by employers' federations. Basic economic theory, however, 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 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 such a 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 impact of such a reform on employment

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[1]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 currently paid by employees only, will be divided equally between employees and employers.

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. 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.

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. A lower labour tax wedge generates positive macroeconomic effects because higher real disposable income – despite lower labour costs – eventually increases private consumption, employment, and private investment. These effects are small, however. Labour costs fall for two reasons. First, because of the reduced contribution rate for employees, workers are willing to lower their gross wage demands. Second, they accept lower gross wages as a result of the higher contribution rate for employers to mitigate the decline in labour demand.

While the reintroduction of parity funding of the statutory health insurance scheme is budget-neutral ex-ante, it is not ex-post. As the reform triggers a permanent decline in gross wages, which are the base for taxes and social security contributions, it lowers public revenues in the long run. In practice, these revenue losses would 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. 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 boost 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 just under 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.[2] These findings highlight the importance of

[2]Macroeconomic effects may turn negative when capital taxes are increased or public investment is

operating in a general-equilibrium framework to analyse the macroeconomic effects of (reintroducing) parity funding. While the literature, which we will discuss below, has focussed on the labour market effects, it has for the most part neglected the feedback on public revenues in general equilibrium.

Importantly, the choice of the fiscal instrument 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 associated 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 can not 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 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.

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 there is a crucial difference between shifts of social security contributions between employees and employers that (a) leave the overall contributions rate unchanged and (b) leave the ratio between total labour costs and net wages, i.e. the labour tax wedge, unchanged (Goerke, 2002, chapter 6.2). It is the latter that determines the economic incidence and the effective burden of social security contributions and labour taxes.[3] Importantly, the planned reintroduction of equal funding of health care contributions leaves the overall contribution rate unchanged, but reduces the ratio between total labour costs and net

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.

[3]Indeed simulating a tax shift that leaves the tax wedge constant in our model does not affect GDP and employment in the long run.

wages. It therefore reduces the effective tax burden. By the same token, abandoning parity funding in 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).

The result that reducing the labour tax wedge increases employment is a fairly robust finding in the empirical literature (see Nickell, 2004, and OECD, 2011, for surveys). Theoretically, the (un)employment effects of a change in the labour tax wedge have been addressed taking into account the design of unemployment benefits. In particular, it matters whether unemployment benefits are indexed to net wages or not (Pissarides, 1998; Nickell and Layard, 1999; Goerke, 2002; Bovenberg, 2006; Cahuc, Carcillo, and Zylberberg, 2014: p. 764). If unemployment benefits are indexed to net wages, thereby ensuring a fixed replacement rate, a change in the labour tax rate changes net wages and unemployment benefits symmetrically, leaving the attractiveness of employment relative to unemployment unchanged. As a result, unemployment responds only marginally to tax changes (if at all), as gross wages absorb most of the adjustment. By contrast, if unemployment benefits are not indexed to net wages, a change in the labour tax rate alters the attractiveness of employment relative to unemployment, and unemployment responds more strongly to tax changes. Technically, the labour supply curve is steeper when unemployment benefits are indexed to net wages. As a result, tax changes that shift the labour demand curve as well as tax changes that shift the labour supply curve lead to smaller changes in unemployment and to larger changes in gross wages. In GEAR, this is also the case. When unemployment benefits are indexed to net wages, the effects of the reintroduction of parity funding remain the same qualitatively, but are quantitatively smaller.

Our paper is also related 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. (2018) 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.

The rest of the paper is organised as follows. Section 2 describes the model. In section 3, we present the numerical simulation results, while section 4 explains the underlying economic mechanism in more detail. A welfare assessment can be found in section 5. Section 6 concludes.

2. The model environment

The world is described by the estimated New Keynesian DSGE model GEAR. 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. In the main text of this paper, we provide only a non-formal description of the model. A more detailed and formal description can be found in the appendix and in Gadatsch et al. (2016).

Germany and the rest of the euro area essentially display the same economic structure. Households optimise their consumption, savings and labour supply decisions. 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). 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).

Labour and capital are the factor inputs for the manufacture of goods. The production side is characterised by monopolistic competition including nominal and real frictions in line with Christiano et al. (2005, 2011). 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 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. 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.

3. 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 employeesŚ social security contributionrate by 0.5 percentage points and increasing the employersŚ contribution rate by the same percentage points. These changes are simulated as a permanent change that either (a) occurs suddenly, (b) is anticipated, as it was already announced in the first quarter of 2018 but does not enter into force until January 2019, or (c) is implemented in a situation where the monetary and fiscal policy rules are suspended for three years (12 quarters). The latter two scenarios are included to show that anticipation and the current monetary stance do not affect our results much. 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, that the changes are unanticipated (or, in scenario b, anticipated one year in advance) 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 with the non-linear model under the assumption of rational expectations. Results for the transitional dynamics are summarized in Figures 1 to 3 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, ceteris paribus, 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 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.

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 labor 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. As a result, 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.

The fundamental transmission mechanism does not change if the measure is credibly announced in advance (scenario (b)). Under the assumption of rational expectations, economic agents will immediately adjust their behaviour at the time of the announcement that the measure will be implemented as of January 2019. Therefore the expected aggregate wealth effect has an immediate impact. Compared to a situation in which the measure is implemented unexpectedly in January 2019, the adjustment path is basically shifted forward (see Figure 2). The only difference occurs between the announcement and the implementation. This is due to the fact that liquidity-constrained households cannot increase their consumption in anticipation of a future higher net wage income. These households are rather forced to reduce their consumption, as the gross wage declines immediately. However, as the effects are generally relatively small and the rather short announcement period does not offer enough – given the adjustment costs – reaction time, the difference is minor. A longer announcement period would result in larger differences.

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

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

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).

Figure 1: Adjustment paths given changes in the contribution rate

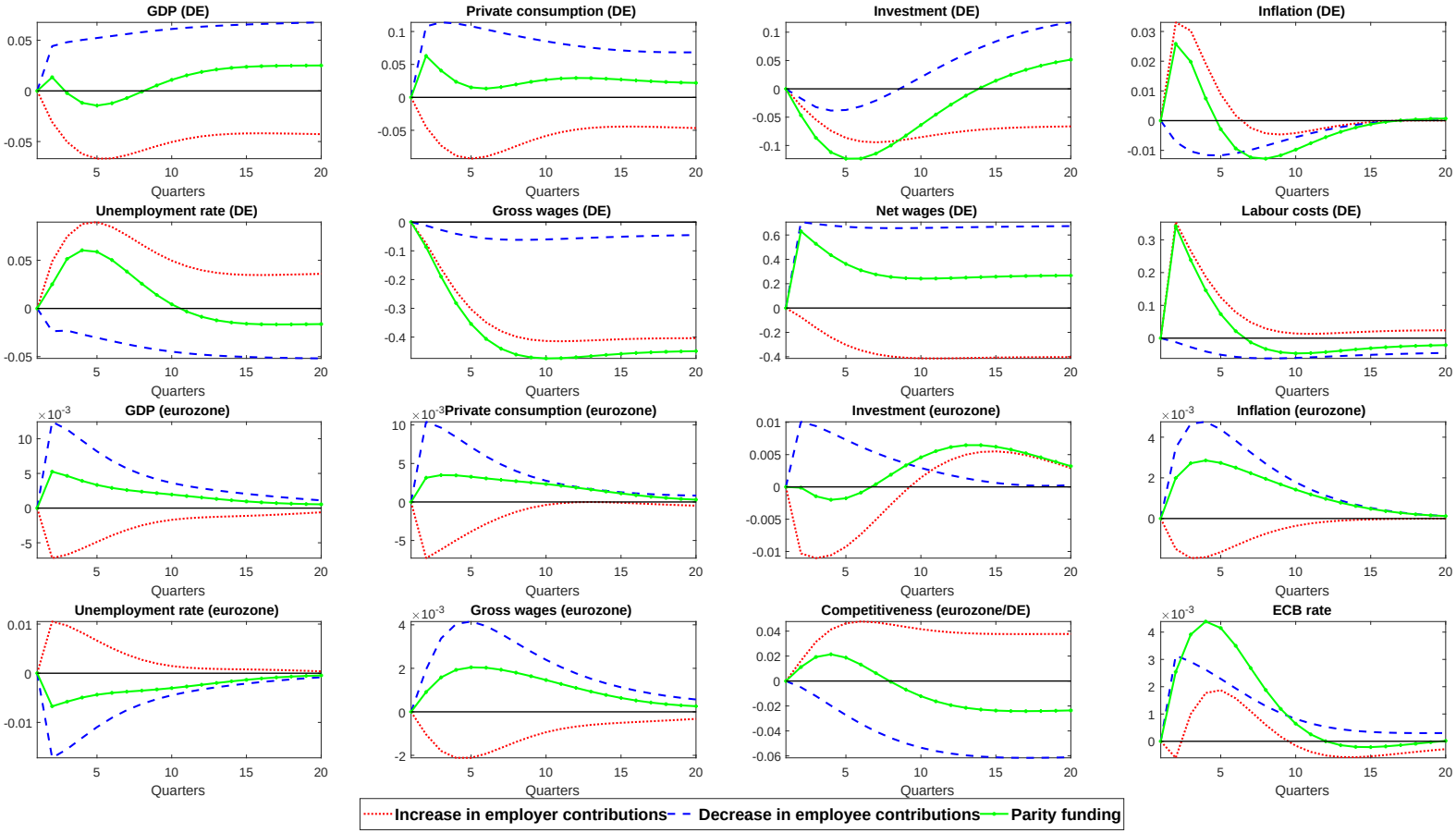


Figure 2: Adjustment paths given a change in the contribution rate with and without anticipation

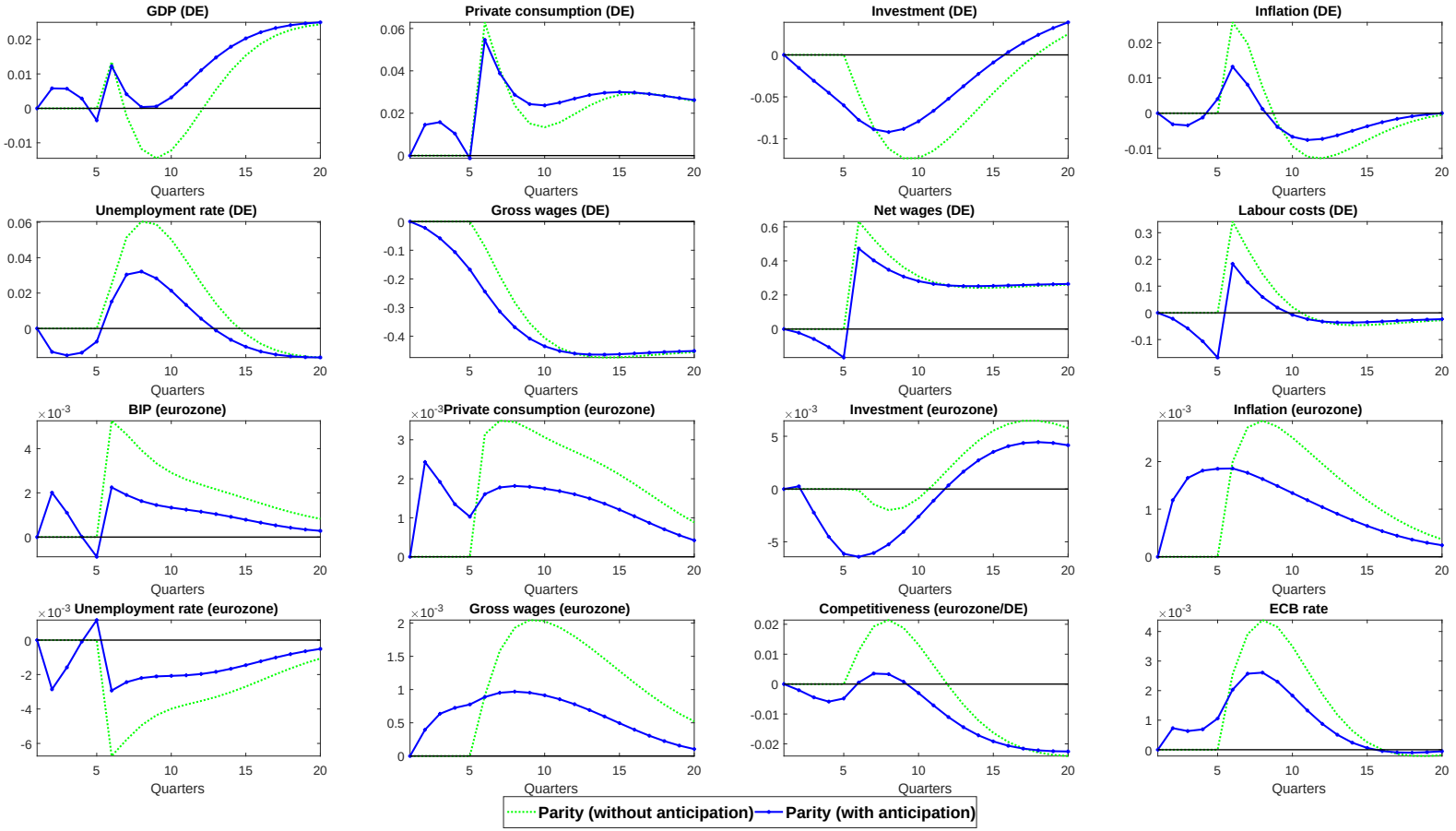
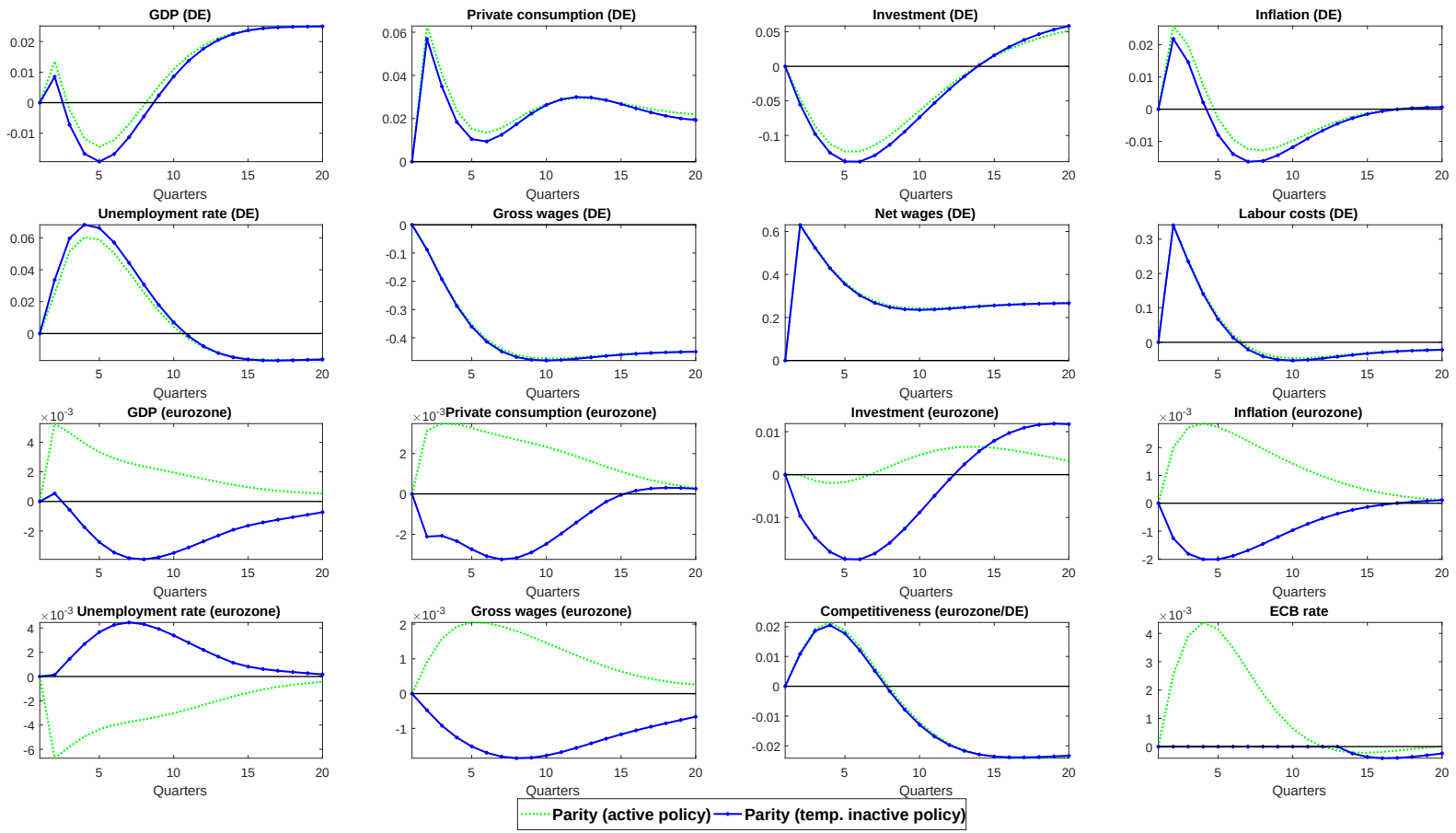


Figure 3: Adjustment paths given a change in the contribution rate with and without fixed reaction functions



If monetary and fiscal policy do not react to changes in the macroeconomic variables for 12 quarters (scenario (c), a kind of proxy for an accommodative economic policy implemented by suspending the fiscal and monetary reaction functions), there are no significant changes in the transmission channel (see Figure 3). The spillovers to the rest of the euro area are somewhat stronger – at least in the short term – because higher import demand in Germany is not dampened by a rise in the policy interest rate. The differences are only marginal in this case, however, and are negligible overall.

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.[4] The ranking of financing instruments also applies regarding employment and unemployment, respectively.

4. Building intuition

Given the "irrelevance theorem" discussed in the introduction, it might at first sight seem somewhat surprising that a mere redistribution from employee to employer contributions gives rise to positive macroeconomic effects in the long run. Here, we inspect the mechanism in more detail. In Walrasian models, the labour market is in equilibrium if labour supply and labour demand are in balance. The intersection between these supply and demand curves determines the market-clearing wage.

The supply of labour on such a labour market is determined by equating the marginal disutility of labour with the marginal "gain" from labour (i.e. marginal utility of consumption financed by net wage income). The former is generally derived from the utility function of households. Forgone earnings, such as forgone unemployment benefits, can affect this disutility. This is the case in GEAR. As a rule, the marginal gain is the net wage (multiplied by the marginal utility of consumption). Abstracting from positive unemployment benefits and public employment, which only complicates the formal expressions without contributing to the intuition, the labour supply function in GEAR – as well as in any other model containing a Walrasian labour market – can be

[4]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.

simplified and shown in a somewhat stylised manner as

$$(1 - \tau_t^w)\, w_t = \frac{\theta^w}{\theta^w - 1} \cdot \frac{\kappa^w\, N_t^\phi}{\mu\, \lambda_t^r + (1-\mu)\lambda_t^o}, \tag{1}$$

where τ_t^w represents the employees' social security contribution rate, w_t the gross wage and N_t employment. λ_t^i is the marginal consumption utility of liquidity-constrained households ($i = r$) and non-liquidity-constrained households ($i = o$), while μ is the corresponding population share of those who face such a constraint. ϕ represents the Frisch elasticity of labour supply, which determines the shape of the disutility of work curve, and κ^w a weighting parameter (relating the disutility of work to the utility of consumption). θ^w describes the substitutability between different worker types, giving some market power to workers in the bargaining process. In the neoclassical framework, $\theta^w/(\theta^w - 1) = 1$.

Labour demand is given by equating the marginal product of labour with its marginal costs, generally gross wages plus social security contributions. In a simplified form, it holds that

$$(1 + \tau_t^{sc})\, w_t = mpl_t, \tag{2}$$

where τ_t^{sc} represents the employer social security contribution and mpl_t the marginal product of labour. Given a "normal" production function, which is generally assumed, the marginal product of labour is decreasing in employment ($\partial mpl_t/\partial N_t < 0$).

As described above, market equilibrium is characterised by the fact that labour supply and labour demand are in balance. Formally, this is the case if

$$mpl_t = \frac{1 + \tau_t^{sc}}{1 - \tau_t^w} \cdot \frac{\theta^w}{\theta^w - 1} \cdot \frac{\kappa^w\, N_t^\phi}{\mu\, \lambda_t^r + (1-\mu)\lambda_t^o}. \tag{3}$$

Hence, in market equilibrium, the marginal gain from employment (marginal product of labour) and the marginal loss from employment (disutility) have, in principle, to be in balance. As can be seen from Equation (3), social security contributions (and labour taxes in general) drive a wedge between the marginal product of labour and disutility. Totally differentiating equation (3) with respect to labour and the contribution rates, it can easily be seen that $dN_t/d\tau_t^w = (1 + \tau_t^{sc})/(1 - \tau_t^w) \cdot dN_t/d\tau_t^{sc}$ holds. Therefore, a redistribution of social security contributions that leaves the tax wedge, $(1 + \tau_t^{sc})/(1 - \tau_t^w) > 1$, constant, leaves employment unchanged. Such a neutral redistribution of contribution rates from employees to employers, however, requires an increase of the employers' contribution rate that is *larger* than the decline of the employees' contribution rate (in percentage points).[5]

[5]Note that, in this situation, we would still observe similar short and medium-term adjustments as presented in Figure 1. Hence, while neutral in the long run, such a tax shift would still generate a small recession in the medium term.

Thus, a reduction of the 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. This fosters employment and generates positive macroeconomic effects. At the same time, the gross wage w_t declines; see equations (1) and (2). Given that this wage rate is the base for the labour income taxes and (also other) social security contributions, such a tax shift, through budget-neutral ex ante, is not budget-neutral ex post.[6] Hence, the government faces revenue losses after such a tax shift. As we have seen in the previous section, it matters what the government does to offset these losses for the overall macroeconomic impact. In the next section, we also show that it matters for the welfare evaluation of this policy measure.

Walrasian modelling of the labour market has been criticised, however. Other effects that were neglected here and are relevant in other models could produce different results. This is due to the fact that, in this instance, the concept of the "outside option" is relevant for wage negotiations, which are mostly structured as a Nash game. In other words, the employees' alternatives are relevant. If this "outside option" is structured in such a way that employee taxation changes in line with the net wage (unemployment benefit payments based on the net wage, for example), it tends to be more likely that it is irrelevant whether the tax is paid by employees or employers (see Pissarides, 2000, chapter 9). If the outside option is influenced by constant terms, such as by home production fixed by a single parameter or fixed unemployment benefits (eg for the long-term unemployed), positive effects – by analogy with the above – can also be generated. Therefore, although the simulation results presented above in the context of the GEAR model are robust, alternative labour market models may also produce other outcomes, and research should continue analysing macroeconomic effects of a distribution of the tax burden. For a first step in this direction, see Attinasi et al. (2018), who provide a more formal description of the arguments presented in this paragraph.

5. Welfare

As shown above, the planned return to parity funding of the statutory health insurance scheme implies positive macroeconomic effects in the long run. We now turn to analysing its welfare implications. While being able to increase consumption in the new long-run equilibrium, 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

[6] This holds unless the wage bill increases due to the resulting increase in employment and despite lower gross wages per employee, which would offset public revenue loss. However, given standard utility and production functions with increasing marginal disutility of labour and decreasing marginal productivity of labour, respectively, this does not happen.

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 welfare gain, ce^i, such that

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

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 order to live in the new steady state after 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)

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 is able to produce welfare gains for both household types.

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.

6. Conclusions

Using the New Keynesian DSGE model GEAR, this paper shows that the German Federal Government's plans 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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