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A one-off wealth levy? Assessing the pros, the cons and the importance of credibility

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Non-technical summary

Research Question

The current crisis resulted in many industrialised countries experiencing sharply rising public debt ratios, some of them lost the confidence of the financial markets and have had to pay high risk premiums on government bonds. However, in some countries high public debt is accompanied by considerable net wealth owned by the private sector. Against this setting, the IMF has recently discussed a one-off levy on private wealth in order to bring down public debt. Given that a one-off capital levy can economically be very harmful, it is of significant policy relevance to spell out the demanding conditions for a beneficial implementation and evaluate its potential economic effects vis-à-vis conventional fiscal consolidation.

Contribution

Using the New Keynesian DSGE model framework FiMod, we analyse how a one-off capital levy may compare to conventional fiscal consolidation in terms of the effects on production, private consumption and investment. We focus on the importance of forming expectations with regard to the one-off nature of the levy. Furthermore, we make an ad-hoc attempt to go beyond the model framework and discuss the impact of alternative model setups, specify the conditions under which the capital levy may become a viable policy option for policy and discuss some of the important practical implementation problems.

Results

Our results show that if the government is successful in credibly committing to not repeating the levy, the levy causes relatively few distortions. If the government commitment not to repeat the levy is, however, permanently non-credible, the wealth levy is much more costly than conventional fiscal consolidation in the long run implying lower output and higher unemployment. The reason is that, in this case, its effects correspond much closer to a permanent increase of taxes on capital returns, which is comparatively costly in the New Keynesian DSGE framework. For policy, the results suggest that the one-off levy may be considered as a relatively attractive alternative for the deleveraging of high-debt crisis countries on the verge of a national emergency such as sovereign default if the one-off character of the levy is credible and given the design of the levy.

Nichttechnische Zusammenfassung

Fragestellung

In der Staatsschuldenkrise sind die Schuldenquoten in vielen entwickelten Volkswirtschaften sprunghaft angestiegen, und oftmals waren ein schwindendes Vertrauen der Kapitalmärkte und hohe Risikoprämien auf Staatsanleihen zu verzeichnen. In einigen dieser Länder stehen hohen staatlichen Schuldenquoten allerdings erhebliche Vermögensbestände im privaten Sektor gegenüber. Vor diesem Hintergrund hat der IWF vor kurzem eine einmalige Abgabe auf privates Vermögen zur Reduktion der Staatsverschuldung diskutiert. Da eine einmalige Vermögensabgabe potenziell sehr schädliche Wirkungen entfalten kann, ist es aus politischer Sicht von Bedeutung, die anspruchsvollen Bedingungen für eine erfolgreiche Umsetzung einer Vermögensabgabe zu nennen und die ökonomische Wirkung der Abgabe mit der von konventioneller Konsolidierung zu vergleichen.

Beitrag

Wir analysieren mit einem Neukeysianischen DSGE Modell, wie die Wirkung einer einmaligen Vermögensabgabe auf Produktion, privaten Konsum und Investitionen im Vergleich zu konventionellen Konsolidierungsmaßnahmen ausfallen. Wir legen dabei ein besonderes Augenmerk auf die Erwartungsbildung hinsichtlich des Einmalcharakters der Vermögensabgabe. Außerdem diskutieren wir mögliche Auswirkungen alternativer Modellierungen, arbeiten die Voraussetzungen heraus, unter denen eine einmalige Vermögensabgabe eine politische Option sein könnte und erörtern einige wichtige praktische Umsetzungsschwierigkeiten.

Ergebnisse

Unsere Resultate zeigen, dass die einmalige Vermögensabgabe eine relativ vorteilhafte Politikmaßnahme sein kann, wenn die Regierung glaubhaft machen kann, dass diese tatsächlich nur einmalig erhoben wird. Wenn die Regierung dies allerdings nicht kann, ist die Vermögensabgabe im Vergleich zu konventioneller Konsolidierung langfristig schädlicher, das heißt hier verbunden mit langfristig weniger Produktion und höhere Arbeitslosigkeit. Dies liegt daran, dass die einmalige Vermögensabgabe in diesem Fall analog zu einer Kapitalertragsteuer wirkt, die in diesem Modellrahmen vergleichsweise ungünstig ist. Für die Politik lässt sich schließen, dass die einmalige Vermögensabgabe nur im Fall einer nationalen Notlage, wie z.B. einer drohenden Staatsinsolvenz erwogen werden sollte. Ferner ist die Vermögensabgabe nur dann eine sinnvolle Option, wenn deren Einmaligkeitscharakter durch die auslösenden Umstände und die Ausgestaltung der Abgabe für die Öffentlichkeit nachvollziehbar und glaubhaft ist.

BUNDESBANK DISCUSSION PAPER NO 29/2014

A One-Off Wealth Levy? Assessing the Pros, the Cons and the Importance of Credibility*

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Abstract

From an economic perspective, imposing a credible one-off net wealth levy in crisis times as a tool to ward off a national emergency appears to be advantageous as, in an ideal world, this would not distort market players' allocation decisions. However, in practice, charging such a levy may give rise to distortions and unwanted effects on the real economy. Credibility that the levy will be imposed as a *once-only* measure is key to ensuring that harmful distortions in the allocation of resources are kept to a minimum. This paper confirms this using an analysis based on a DSGE model. In practice, while a government cannot guarantee that such a measure will be taken once only, it can contribute to the credibility thereof in a number of ways. First, the country's future "business model" must become apparent; second, there has to be a basic level of confidence in the government and a firm belief that the budgetary imbalances were not actively caused by the state – at least not by the government currently in power; third, a verifiable outlook of sustainable public finances must be in place; and fourth, the political costs of a repeat levy must be high. This paper also discusses the potential impact of alternative model setups as well as some practical implementation problems.

Keywords: Wealth Levy, Credibility, Public Finances, DSGE Models

JEL classification: E2, E6, D3.

*Contact address: Deutsche Bundesbank, Economics Department, Wilhelm-Epstein-Str. 14, 60431 Frankfurt, Germany. E-Mail: gerhard.kempkes@bundesbank.de, nikolai.staehler@bundesbank.de. We are grateful to Geert Langenus and Karsten Wendorff as well as participants of the European System of Central Banks' (ESCB) Working Group on Public Finance (WGPF) Fiscal Workshop in Sofia for helpful comments. The opinions expressed in this paper do not necessarily reflect the views of the Deutsche Bundesbank or its staff. Errors are ours alone.

1 Introduction

The current crisis resulted in many industrialised countries experiencing sharply rising public debt ratios, some of them lost the confidence of the financial markets and have had to pay high risk premiums on government bonds. This has triggered monetary and fiscal support from other countries and some European Monetary Union (EMU) countries now heavily rely on financial assistance programmes. At the same time, high public debt is accompanied, in some cases, by considerable net wealth owned by the private sector (in some cases, the state also holds large wealth). Against this setting, the IMF (2013) has recently discussed a one-off levy on private wealth in order to bring down public debt via an adjustment of the stocks of private vis-à-vis public wealth.[1] Such a one-off capital levy is fraught with problems and has very demanding requirements to ensure a successful and beneficial implementation. We will argue below that the one-off capital levy may be considered as a relatively attractive alternative for the deleveraging of high-debt crisis countries if governments manage to convince the public that this will be a once-only measure. We will briefly discuss conditions under which this seems more probable, for example in cases of national emergency such as a looming sovereign default. Moreover, the government may have some control over the expectations formed by the public. However, if there is no common belief that the levy is never to be repeated, its long-run effects can be very damaging even when the short-run effects may still look favourable at first glance.

Our goal in this paper is to shed some light on this central aspect of the introduction of a one-off levy on private wealth, the importance of forming expectations with regard to the one-off nature of the levy. Specifically, we analyse how a one-off capital levy may compare to conventional fiscal consolidation (increases in labour income and consumption tax rates as well as a reduction of public consumption) in terms of the effects on production, private consumption and investment using the New Keynesian DSGE model *FiMod*. *FiMod* is a two-country monetary-union DSGE model especially suitable for fiscal policy analyses. In this paper, we also discuss relevant aspects related to a wealth levy that are not (and potentially cannot be) addressed by a stylised model simulation.

As outlined by Eichengreen (1989), the credibility of the government's announcement that the capital levy will not be repeated is key for the relative efficiency of this instrument. We show that, if the government is successful in credibly committing to not repeating the levy, this deleveraging causes relatively few distortions. If the government commitment not to repeat the levy is, however, permanently non-credible, the wealth levy is much more costly than conventional fiscal consolidation in the long run implying lower output, lower consumption and lower investment as well as higher unemployment. The reason is that, in this case, its effects correspond much closer to a permanent increase of taxes on capital returns, which is comparatively costly in the New Keynesian DSGE framework. Our model simulation also suggests that if the population generally believes in the one-off nature of the levy but is sceptical initially (ie the population believes repetition has a positive probability initially, but the government is able to regain credibility), the negative effects of the levy are more moderate.

[1] For a discussion of this topic in a European context, see also Deutsche Bundesbank (2014). We use capital levy and wealth levy as synonyms and refer to a one-off levy on private net wealth.

As any model analysis, our assessment is highly stylised and may not contain important features, such as contagion effects on other countries, administrative difficulties or risk premiums on government bonds. All these issues, which may well alter our results in favour of or against the relative efficiency of the one-off capital levy, are of great importance. Therefore, we also discuss the implications of alternative model setups and further important difficulties related to a wealth levy in this paper. However, future research in this field is definitely needed.

There is a remarkable stream of work accompanying the discussion of capital levies in Europe after World War I, some of it is surveyed in Eichengreen (1989). He also provides an overview of the history of capital levies in the 20th Century, which may also be found in more detail in Hicks et al (1942). Eichengreen (1989) considers the case of Japan directly after World War II, the only example of a successful implementation of a capital levy in times of peace. Suspended democratic institutions and implementation by the US as an outside power facilitated its success. However, the "Lastenausgleich", implemented in Germany in the late 1940s and early 1950s, may also be considered a successful capital levy. Its goal was to mitigate damage suffered due to displacement and its payments were deferred over 30 years, for more details see Bach (2012) or Werner (2012). More recent work focuses mainly on estimating the revenue potential of capital levies, eg Bach, Beznoska and Steiner (2011) and Werner (2012) for Germany, whereas others discuss the capital levy as an instrument for resolving public debt crises (IMF, 2013 and Bundesbank, 2014).

However, to our knowledge, Eichengreen (1989) is the only contribution incorporating the instrument of a capital levy into a macroeconomic model. Using a standard capital taxation framework, Eichengreen (1989) highlights the conditions for success of a capital levy. He finds that - even in the absence of a credible government commitment to never repeat the levy - the damage can be moderate provided that the trigger that causes the government to impose the levy is independently verifiable and not under government control. Thus, if the capital levy is generally perceived as a straightforward consequence of a national emergency, it may still be a comparatively efficient instrument even though the government cannot definitely assure non-recurrence. As outlined above, we contribute to the literature by incorporating the instrument of a capital levy into a New Keynesian DSGE framework and focus on how a one-off capital levy may compare to conventional fiscal consolidation in terms of the effects on output, private consumption and investment. Moreover, we also discuss relevant aspects related to a wealth levy that are not (and potentially cannot be) addressed by a stylised model simulation.

The rest of the paper is organised as follows. In section 2, we describe the model, the simulation design and the results of the model simulation. Section 3 puts these into the perspective of alternative model setups and discusses other relevant aspects. Section 4 concludes.

2 Using *FiMod* to evaluate a one-off wealth levy

In this section, we will first provide a brief overview of the model *FiMod*, a DSGE model developed for fiscal policy simulations. A detailed description may be found in

Stähler and Thomas (2012). Then, we will describe our simulation design and present the simulation results.

2.1 The model

FiMod is a classic New Keynesian two-country model of a monetary union in which country *A* is a member of the monetary union (and country *B* is then the rest of the monetary union). In contrast to most of the larger DSGE models, the integration of a labour market with search characteristics, based on Pissarides (2000), enables involuntary unemployment to be included. It also contains a comprehensive fiscal sector.

More precisely, households make optimal choices regarding savings in physical capital as well as national and international assets and purchases of consumption and investment goods. The latter add to the private-sector capital stock which is rented out to private firms. Household members may find a job in the private or public sector or stay unemployed. Hence, households receive interest and wage payments, unemployment benefits and other fiscal transfers, and they pay taxes. In line with Gali et al (2007), the model also assumes that a fraction of households does not participate in asset markets. Thus, this type of household consumes all of its income each period. These households have become known as "rule-of-thumb" (RoT) households in the literature.

On the firms' side, monopolistic competitors in each region produce a variety of differentiated products and sell these to the domestic and foreign market. No price discrimination between markets is assumed. Firms use labour and private capital as production inputs. A public capital stock is productivity-enhancing. However, its provision is outside the firms' control and conducted by the fiscal authority. Cost minimisation determines the amount of labour and capital input per firm. Because firms enjoy monopolistic power, they are able to set their nominal prices. Wage setting is modelled as a Nash game between workers and firms. Both price and wage setting are undertaken in a staggered manner as in Calvo (1983).

FiMod provides a relatively sophisticated public sector with multiple types of public revenue and expenditure. For instance, revenue comes from taxation on private consumption, labour income (whereby a distinction is also made between taxes paid by employees and those paid by employers), investment income and from lump-sum taxes. Public expenditure comprises unemployment benefits and other transfers, public consumption and public investment. Public consumption is divided between public purchases and the public sector wage bill. The public capital stock has a positive impact on productivity of private firms as in Pappa (2009) or Leeper et al (2010). The model thus features a considerable number of feedback channels between fiscal policy, the government budget and the general economic situation. A fiscal policy rule that responds to the debt ratio ensures that, in the long run, the ratio converges towards a target value and a sovereign default is thus ruled out. The monetary authority sets the nominal reference interest rate. In the euro area, it sets a common rate according to a Taylor-type rule that responds to measured euro-area-wide inflation and the output gap.

2.2 Simulation design

To analyse the difference between consolidation using "conventional" tools and consolidation using a wealth levy, we assume that the debt ratio b_t in country A rises suddenly and unexpectedly by 20 percentage points (pp). Possible reasons for such a rise could be the assumption of private debt (eg from the banking sector) or recourse to guarantees; however, the reason is not specified in our model analysis. Hence, we assume an exogenous change in public debt, and not an endogenous change engendered by a shock on another variable, namely, it is important to outline that fact that the shock is precisely on public debt. The debt ratio is now to be pushed back down to its original level in the medium term. The advantage of this simulation design is that we solely observe the effects of the various consolidation measures.

In order to better understand the following scenario design, let us consider the stylized government budget constraint of our model economy. Defining the (CPI-deflated) per capita value of end-of-period real government debt as $b_t \equiv B_t / P_t$, we can state that it evolves according to a standard debt accumulation equation,

$$b_t = \frac{R_{t-1}}{\pi_t} b_{t-1} + G_t - \left(\tau_t^w \, w_t \, N_t + \tau_t^c \, C_t + \tau_t^k \, (r_t^k - \delta^k) k_{t-1} \right) - T_t^{wealth},$$

where $G_t - \left(\tau_t^w \, w_t \, N_t + \tau_t^c \, C_t + \tau_t^k \, (r_t^k - \delta^k) k_{t-1} \right)$ denotes real (CPI-deflated) per capita primary deficit, ie fiscal expenditures, G_t, minus revenues form labor income, consumption and capital taxation, $\tau_t^w \, w_t \, N_t + \tau_t^c \, C_t + \tau_t^k \, (r_t^k - \delta^k) k_{t-1}$. Here, τ_t^i, with $i = w, c, k$ denotes the labor, consumption and capital tax rate, respectively, w_t is the average economy-wide wage rate, N_t employment, C_t consumption, k_r the capital stock and $(r_t^k - \delta^k)$ capital income net of depreciation. $T_t^{wealth} = \tau_t^{wealth} \, (k_t + d_t + b_t)$ is revenue resulting from a wealth levy on holdings of real wealth in form on private capital, k_t, domestic government bonds, b_t, and internationally traded assests, d_t, where τ_t^{wealth} is assumed to be the tax rate of the wealth levy. We assume its actual value to be zero except for the point in time in which the one-off wealth levy is imposed.

As a basic consolidation scenario, we assume that fiscal policy compensates for the 20 pp rise in the debt ratio after six years (24 quarters) with a mix of various consolidation tools and that the debt ratio returns to its original level. The instrument mix that we implement in our model simulation is motivated by the consolidation measures implied by the recently observed reform packages across Europe. To be precise, it comprises increases in taxes on labour income and consumption as well as reducing public purchases. The tax increases and the reduction of public purchases required are considerable (tax rates up by roughly 5 pp, public purchases down by 10%). It is of course a matter of debate whether political support could be obtained for such fiscal efforts and this is not considered in our simulation. Notice further that different instruments come with different degrees of distortion, and in addition, distortion is different among different types of taxes and different types of expenditure. However, neither extending the consolidation period nor changing the policy mix does not change the qualitative findings of our study. Hence, while our basic consolidation scenario is chosen for illustrative purposes, it does not seem to be an implausible baseline.[2]

[2]See Stähler and Thomas (2012) for a description of the costs and benefits of different consolidation

Furthermore, the study examines the economic impact of reducing the debt ratio by 20 pp via a one-off wealth levy. The wealth tax is modelled by increasing τ_t^{wealth} such that the debt-to-GDP ratio returns to its original level immediately. The increase in the wealth tax rate is imposed ***once*** and ***unexpectedly*** such that, from the households' point of view, it is considered as a lump-sum levy. However, it is important to know what households in the economy expect with regard to ***future*** taxation on wealth. To this end, three variants are simulated: (i) the levy's one-off nature is credible, (ii) the levy's one-off nature is permanently not credible, ie households expect their wealth to be taxed again in future with a certain degree of probability, (iii) the levy's one-off nature is credible in principle, though this is not initially the case for everyone; in this variant, full credibility can be achieved again within 25 years. Provided the households – or at least some of them – do not believe in the one-off nature of the wealth levy, the "non-believers" anticipate that the debt level can rise again by 20 pp and that fiscal policy would, then, subsequently ensure the reduction of this debt by imposing another wealth levy. The tax rate on wealth applied in this case is high enough such that the debt would be repaid at the expected value.

The two scenarios, in which households permanently or temporarily do not believe in the one-off nature of the wealth levy, are technically implemented as follows (see Annex for formal details). At the time when the wealth levy is imposed, there is both a shock to the debt ratio and an additional shock to the way in which households form their expectations. Whereas, in the original steady-state equilibrium, households did not believe that a wealth levy would be imposed, once the levy has been charged for the first time, they attach a positive probability to a further wealth levy being imposed in the future. If the one-off nature of the wealth levy is permanently considered to be non-credible, the probability of repetition is permanently positive, whereas, in the case of temporary non-credibility, it slowly declines via an $AR(1)$-process. In principle, the latter presents us with a quick *ad hoc* way of approximating a learning algorithm. With a certain degree of probability, households thus now expect their wealth to be taxed in the future.

The expected probability-weighted tax rate is calculated as follows. Households expect a wealth levy to be imposed if the debt ratio climbs again by 20 pp. The probability of this occurring is calculated in line with the theory on fiscal limits (see Corsetti et al, 2013). This amounts to an annual probability of 4%. Therefore, this event is expected to occur around once every 25 years. The tax rate that households expect to be charged on their wealth (capital, government bonds, international assets) in this case is high enough for the debt level, which has increased by 20 pp, to be returned to the target value immediately. Households factor this tax rate, multiplied by the expected probability of occurrence, in their Euler equations for their investment decisions. This implies that households expect a quasi-investment income tax to be raised – although this never actually happens in the simulation.

measures in the *FiMod* model. They show that the choice of instruments and timing may indeed influence consolidation costs, but they can never be avoided.

2.3 Simulation results

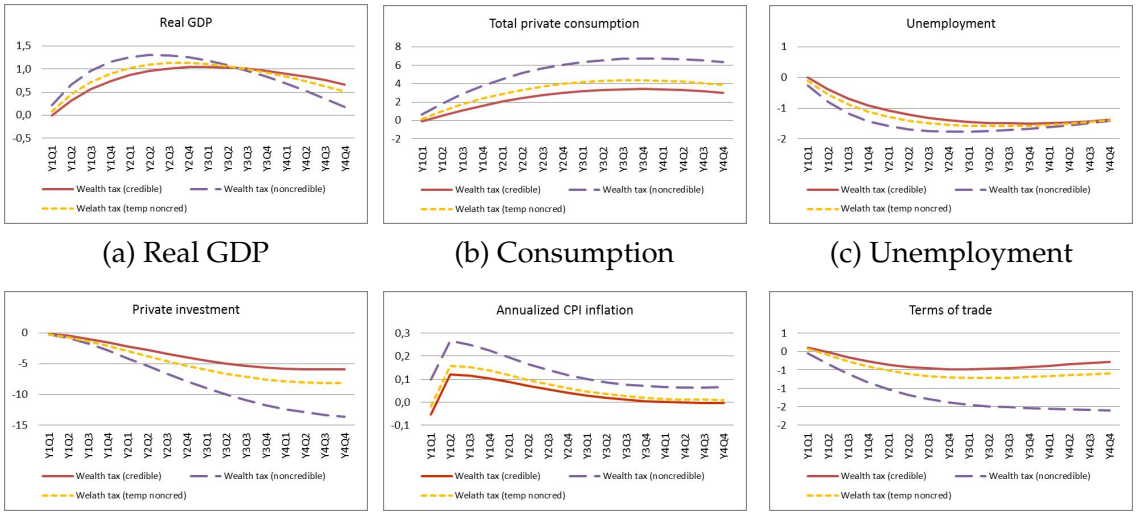
Conventional consolidation measures are always associated with costs in the sense of temporary GDP and consumption losses because they have a direct or indirect influence – via distortions of allocation decisions, for example – on demand and production.[3] In the baseline scenario ("conventional consolidation"), the rise in value-added tax makes the price of consumption more expensive and, at the same time, the increase in labour income tax lowers average net income. Employees increase their gross wage demands, but this cannot offset the decline in net income (higher gross wage demands reduce the incentive for job creation, thus raising the level of unemployment). All of this leads to a decline in private consumer demand. Owing to expectations of temporarily falling real interest rates, optimising households increase the demand for capital goods (known as "crowding in") which, from a macroeconomic perspective, counteracts the fall in consumer demand to some extent, even though it cannot fully compensate for it. Aggregate demand is additionally diminished by the reduction in government consumption. As a result, this lowers macroeconomic output which, alongside elevated labour costs, contributes further to the rise in unemployment. In order to counteract this, companies lower their prices, thus improving international competitiveness and causing exports to rise. Stronger export demand and higher domestic investment cannot, however, offset the contraction in domestic (consumer) demand, resulting in a fall in GDP.

The charts below illustrate the difference in the developments of each selected macroeconomic variable relative to the baseline scenario for the cases where (i) the levy's one-off nature is credible (red), (ii) the levy's one-off nature is permanently non-credible (blue), (iii) the levy's one-off nature is credible in principle, but a higher repetition probability is initially anticipated (yellow). The following charts each show the difference in the deviations from the baseline scenario ("conventional consolidation") in terms of percentage points. Positive values mean that, compared with the baseline scenario, the observed variable in the alternative scenario develops less negatively by the percentage points indicated on the y-axis, whereas negative deviations signify a relatively larger reaction.

These simulations demonstrate that, in the existing model framework, consolidation via an unexpected and credibly one-off wealth levy has positive effects relative to the baseline scenario. The negative effects on GDP and private consumer demand are significantly weaker (see Figures 1a and 1b), and the rise in unemployment is smaller with the imposition of a wealth tax – primarily owing to higher GDP growth (see Figure 1c). The smaller decrease in demand, however, also results in lower deflationary pressure as companies are not forced to revise prices downwards ("inflation" is thus greater relative to the baseline scenario) to such an extent that the terms of trade are not so greatly improved either (see Figures 1e and 1f). Where a wealth levy is imposed, investment activity develops at a temporarily weaker rate compared with the baseline scenario due to the fact that the temporary reduction of real interest rates is lower (Figure 1d).

[3] Such short-term costs arising from conventional consolidation are standard for this type of model. Depending on which consolidation instrument is used, they can only be reduced and not prevented. Temporal deferral of consolidation does not prevent the costs (see also Stähler and Thomas, 2012).

Figure 1: Relative short and medium-term gains/losses from a wealth levy



(a) Real GDP (b) Consumption (c) Unemployment

(d) Investment (e) Inflation (f) Terms of trade

Notes: Figure shows the percentage point differences of the deviations from the baseline consolidation scenario when consolidating with a wealth levy. Positive values imply that the observed variable develops less negatively in the alternative scenario.

We can be explain this by the fact that, in a New Keynesian model framework, a wealth levy has barely any distorting effects and thus provokes hardly any consolidation costs. This represents, at least to a certain extent, something of a technical property of the model: in the stereotypical New Keynesian model framework with one or more representative households (or types of household), wealth is held by optimising households known as Ricardians. This type of household is characterised, inter alia, by the fact that it determines its consumption and savings path optimally in line with the permanent (real) income hypothesis and it can always invest or borrow as much money as it requires on a perfect capital market at a certain interest rate. In this regard, it is not subject to any restrictions. Clearing the temporary increase in government debt, which itself does not distort the system, through a lump-sum tax that only affects this type of household does not, based on these assumptions, cause any change to this type of household's optimal decisions because this is merely a case of a financial transaction and real implications can be avoided by using the perfect capital market.[4] An unexpected and credibly one-off wealth levy functions in the same way as a lump-sum tax that is only levied on optimising households. Thus, in order to provoke real effects within an economy through such a wealth levy, Ricardian behaviour (an assumption

[4]The picture looks different if it is assumed that government debt will increase, for example, as a result of a temporary rise in government spending. In this case, this leads to demand effects which alter the level of permanent income due to fluctuations in demand. Households are still able to "push away" the financing effects, but not the fluctuations in demand, with the result that this simulation would cause real effects. In order to isolate the effect of the wealth levy from that of other shocks, however, a direct exogenous rise in the debt level, as described above, has been assumed here.

that has already been long disputed) needs to be disrupted.[5]

However, in the model framework used in the simulation, which actually presents very favourable conditions for an unexpected one-off wealth levy, real effects are also perceptible, if it is assumed that optimising households do permanently not believe in the credibility of the levy's one-off nature. As in the previous simulation, the debt level thus returns directly to its original level. Thereafter, however, the optimising households believe that their wealth will be used again in the future to finance the government budget. This leads to a reduction in the expected return on capital investments. Due to the fact that this – as with investments in other assets – decreases, the Ricardians raise their interest claims in order to partially compensate for the taxation, and reduce both their willingness to save and their investments to a far greater extent than when the one-off nature of the wealth levy is still credible, as illustrated in Figure 1d. By comparison, they initially increase their consumption, which in turn leads to short-term GDP growth on account of the elevated demand (see Figures 1a an 1b). Curtailed investment activity, however, leads to a reduction in capital stock, which depresses labour productivity to the extent that companies raise their prices in the medium term. This results in a significant deterioration in international competitiveness, a further drop in exports and – at least in the medium term – a greater rise in unemployment (Figure 1c and Figure 1f). Temporarily rising wage demands cannot be maintained over the long term with the result that real wages decline in the medium and long term, which then also has an impact on domestic consumer demand. Overall, the effects of imposing a wealth levy, whose one-off nature is non-credible, are very similar to those of permanently increasing an investment income tax, though the tax base is somewhat different (earnings versus holdings).

Whereas the temporary adjustment effects of the wealth levy whose one-off nature is permanently non-credible may appear quite positive at first glance (the aforementioned short-term improvements in GDP and consumer effects, for example), the long-term implications are problematic. As can be discerned in Table 1 below, output, consumption and investment all decline permanently amid a rise in unemployment. The effects are substantial in some cases.[6]

In the scenario of a wealth levy being imposed whose one-off nature is credible in principle but initially carries the expectation of a significant repetition probability, the same qualitative effects occur in the adjustment process, as are observed when the imposition of a wealth levy is permanently expected to be repeated. These effects, however, are much less pronounced. According to our simulation design, households make the long-term assumption in principle that their wealth will not be taxed again. Accordingly, they do not take as many precautions as in the case when they safely assume that this taxation will be repeated. Nonetheless, a number of them are initially unsure whether this will actually happen, and trust must be earned once again. The

[5]This can be achieved by incorporating (possibly only occasionally binding) credit restrictions into this model explicitly for all households or by moving to an *overlapping generations model* framework, in which no 100% altruism exists. These aspects are discussed in section 3.

[6]The quantitative values should only be considered an indicator of how serious the negative long-term effects could be, even though a wealth levy in the short term (in the first two to three years) has positive implications – at least at first glance – for GDP and consumption (see previous description). However, the precise extent of the effects relies heavily on how often and in what amount households anticipate a repetition of the levy in the future.

Table 1: Long-term effects compared with the original *steady state*

Real GDP	-6.87
Real private consumption	-2.64
Real investment	-14.21
Real exports	-7.38
Real imports	-1.33
Unemployment	1.42
Real wage (pre-tax)	-2.55
Terms of trade	-6.74

Notes: Table shows the percentage deviation of new steady state when the one-off character of the wealth tax is not credible relative to original steady state (percentage pint deviations for unemployment rate).

quicker the uncertainty regarding the one-off nature can be eliminated, the less distorting the effects of the capital levy will be. In our simulation, this takes 25 years, and the effects are substantially weaker than in the case of complete non-credibility. However, the extent to which such an anticipation process is persistent ultimately remains an empirical question and is dependent on fiscal policy's credibility and on the concrete implementation.

3 Discussion and assessment of the simulation results

In the previous section, we showed that a levy on wealth accumulated in the past will cause less distortions in the given model framework than a correspondingly higher ongoing tax burden (income and consumption tax), provided that it applies at a specific cut-off date, there is a belief that it will never be repeated and it is announced unexpectedly. This is because the one-off wealth levy is, under ideal conditions, impossible to avoid. All other things being equal, it would therefore be the more efficient measure in terms of output and welfare. However, this insight is based on a specific model framework. Extending the model to include some relevant features generates further trade-offs, whose impact has to be considered. Moreover, it is likely to prove impossible for the government to guarantee the one-off nature of a wealth levy. Below, we will therefore discuss the circumstances under which the one-off nature could appear (more) credible, and what implications alternative model features could have. In addition, we will look briefly at potential problems with practical implementation.

3.1 The credibility of the one-off character of the levy

The government cannot generally guarantee the one-off nature of the levy, though circumstances could make its exceptional nature more credible if

- the levy is directly related, both materially and in terms of timing, to a national emergency, which is to be averted using the wealth levy,

- the government is not to blame for the budget imbalances it is intended to remedy, at least not actively (for instance, it is the result of a real estate bubble that hardly anyone saw coming versus latent debt bias), and the government is basically considered trust-worthy,
- high legal hurdles to a repetition of the levy are established (this would also often involve high political costs),
- the country's "business model" becomes apparent for the time after the wealth levy, ie necessary structural reforms were carried out or credibly instigated ahead of the levy, and spending has been adjusted to potentially lower medium-term growth prospects,
- the levy generates sufficient revenue, and the budget is balanced once the levy has been raised (ie interest spending should drop sufficiently) in order to dissipate any remaining doubts as to sustainability, which would make repeating such a "one-off" levy necessary. If the wealth levy proves basically practicable, but the revenue generated is found to be too small, further wealth levies are likely to be seen as probable. The proceeds from the levy should be used directly to cut debt, and the outlook for the debt ratio must be believably stable.
- a promise could be given to repay the levy once the debt ratio falls below a certain value. That would potentially increase the credibility of the one-off nature of the levy. After the successful reduction of the debt ratio, it would then, with hindsight, have been akin to a compulsory bond purchase. The government could thus attempt to make one-off levies less attractive for the state. In terms of details, a number of unanswered questions would have to be clarified (eg securitisation of this right etc).

However, especially in those countries for which such wealth levies might be seriously considered, the future business model for the country is likely to be unclear or there is likely to be insufficient confidence that the government or state will put the funds to good use. The state could, however, attempt to increase the credibility of the one-off nature of the levy by incorporating the above points when designing the levy. Overall, it is difficult to determine whether policymakers can make the one-off nature of the levy credible. This is also likely to differ from country to country. The above analysis of macroeconomic causal relationships suggests, however, that this is a basic precondition for a wealth levy to have no negative long-term effects.

3.2 Potential effects of alternative model features

In the following, we will discuss the potential effects of alternative model features or setups. Again, we cannot expect a conclusive analysis, and additional research is certain to be necessary. Nonetheless, we should not lose sight of these aspects in the debate.

3.2.1 Disrupting *Ricardian* equivalence

Where taxpayers have a finite planning horizon because intergenerational altruism is limited, the wealth levy has direct wealth effects (Ricardian equivalence is disrupted). If the wealth levy leads to redistribution in favour of future generations, generations will adapt their decisions in terms of consumption/saving and work/leisure. Given typical preferences, the negative wealth effect for the "living generation" is likely to mean more work and less consumption for the foreseeable future. Overall, output could increase at the current end, and the welfare of the living generation could drop (at least if the government does not adapt its policies in other ways). The question of the welfare effects of intergenerational redistribution depends on the circumstances and is probably difficult to answer even for a concrete case. Thus, the wealth levy may be worth considering, from the welfare point of view, especially in cases where the existing intergenerational distribution already quite obviously disadvantages future generations.

3.2.2 Heterogeneous agents

Besides depending on the credibility that a levy will be a one-off and on the selected model framework, the effects of the wealth levy on **private consumption** will probably hinge on the concrete conditions prevailing in the country, for instance

- wealth itself (amount, distribution, composition, liquidity, assets' market depth),
- wealth and income elasticity of the consumption ratios,
- credit conditions,
- the existence or closure of loopholes (tax evasion, tax avoidance or migration),

and on the specific design of the tax

- in terms of gross versus net assets,
- the size of tax-free allowances,
- the types of wealth taxed,
- and the possibility of spreading the tax payments over time (as, for instance, the "Lastenausgleich" in Germany in 1952 when payments levied on wealth were spread over 30 years).

In terms of **private investment**, the levy is likely to make internal funding more difficult for enterprises, at least in the short term, and in the short run, negative effects are probably inevitable, as the tax would likely reduce the capacity to borrow for investment purposes. However, this could – once the government debt ratio has been successfully reduced – be partly offset by declining risk premiums for corporate bonds, provided the latter are correlated with premiums on government bonds. The capital of companies with weak earnings could be eroded in the medium and long term, although the damage could be limited when net wealth is taxed. Moreover, these

problems could be mitigated by spreading the tax burden over time and through tax-free allowances (the latter would probably help only smaller enterprises). The one-off wealth levy should ultimately be neutral in terms of international investment decisions, provided it is linked exclusively to the investor (or, to be more precise, to the investor's place of residence).

The successful mobilisation of a significant sum and societal acceptance could be interpreted by international capital providers as successful frontloading of consolidation. That could result in **risk premiums** on sovereign bonds dropping. Although net assets within the country would be unchanged, the risk of public finances becoming unsustainable or not being serviced would drop. If one assumes that the decline in risk premiums on sovereign bonds would be accompanied by falling risk premiums for private bonds and loans, the one-off wealth levy could potentially be an instrument to achieve just that.

3.2.3 Potential liquidity effects and credit constraints

If the levy refers to net assets, these net assets should in principle be available as collateral at the time the levy is raised. However, restrictions in the banking system could disrupt lending.

Once payment has been made, the wealth levy will, all other things being equal, reduce the present value of the taxpayer's assets, which means that credit constraints among the households/enterprises affected by the tax are likely to be higher than before. This could have negative effects on domestic demand and output.

If, however, the country's banking sector was undercapitalised ahead of the wealth levy mainly because of unsustainable public finances and the levy ensures sustainable public finances, banks could conceivably be more stable as a result and liquidity supply to the private sector might not deteriorate on balance. In this case, the supply of liquidity to those parts of the private sector not affected by the wealth levy could improve.

3.2.4 Distribution issues

Besides the issues surrounding macroeconomic effects and efficiency, the question of a one-off wealth levy versus "conventional" consolidation or one-off wealth levy versus assistance from abroad is also one of a distribution of burdens, which has to be decided at a political level. The distribution effects of a wealth levy of a specified size can be designed mainly using tax-free allowances and by designing the tax schedule.[7] The design of the levy would have to be subject to a broad societal debate and would have to be decided democratically.

In general, older generations and groups of the population with more financial or non-financial assets, real estate and business property would be likely to bear a larger burden. The charge would hit younger generations and groups of the population whose wealth consists mainly of human capital less hard, at least if the one-off nature of the levy is credible. However, this group could also be affected by the wealth

[7] The burden will, moreover, certainly also depend on the exclusion of individual types of asset and the valuation rules chosen.

levy in terms of potential inheritance. The treatment of receivables such as pension assets or pension claims could be controversial.

Whether the one-off capital levy is publicly accepted could also depend on whether the tax is perceived as a necessary complement to the other austerity efforts under the deleveraging process (taxation of wage income and private consumption, limiting government transfers and government consumption such as staff costs) and whether it is considered as a kind of one-off "national task" (see also Ball et al., 2013).

3.2.5 Potential implementation problems in practice

It would be comparatively easy to impose a one-off wealth levy in the form of a (one-off) surcharge on an existing tax for countries where a general and broad (continuous) tax on wealth is currently charged. In all other cases, considerable practical problems may arise which we will discuss briefly below. However, a conclusive evaluation with possible solutions is beyond the scope of this paper.

If the levy were introduced as a tax on business and real estate assets, taxpayers may experience liquidity problems (however, such problems should be limited if the tax is on net wealth). It is also possible that market prices for certain assets would fall. To ease liquidity problems, one conceivable approach would be to spread payment of the levy over a period of time (for instance, as was the case with the "Lastenausgleich" in Germany resolved in 1952 and spread over a period of 30 years). However, this means that, in some cases, the reduction in government debt would not take place in its entirety straightaway and that the present value of the cash flows would be perceptibly reduced if appropriate interest payments are not charged. In cases where the levy cannot be imposed as a surcharge on an existing tax on wealth, the valuation of non-financial assets (if no current market valuation is available) is likely to be relatively time-consuming and rather costly. This is particularly true of real estate, art and business assets.

In some countries, the constitutionality of a one-off wealth levy with sizeable tax rates that is not imposed to manage the consequences of war or a similar catastrophe may be contested. There may also be legal problems if no justification can be given for the selective nature of a tax (above all, if certain types of asset are excluded).

Charging different amounts on different asset types (by means of valuation rules or exceptions for business assets, assets from pension and life insurance as well as for the assets of charitable foundations) would be problematic in other regards, too. Exceptions of this kind open up wide possibilities of evasion thus distorting allocation decisions.

Furthermore, a forced levy can also push up the costs of tax collection and lower tax morality if the measure is not seen to be legitimate. Due to the aspects mentioned above, it cannot be ruled out that tax authorities will see the revenue from other taxes fall (temporarily) due to the wealth levy absorbing administrative costs.

In addition, it is certainly of significance that imposing a one-off wealth levy in one country may trigger contagion effects in other countries if other crisis-hit countries do not introduce such a levy simultaneously. If these countries are experiencing a similar situation, market players may fear that a comparable levy will be imposed in their country, too. This could lead to distortions of allocation decisions, portfolio shifts,

capital flight, tax evasion and, in certain circumstances, even migration and a slump in market prices for certain assets.

4 Conclusion and evaluation

From an economic perspective, imposing a credibly one-off net wealth levy appears, at first glance, to be advantageous especially as this would not distort market players' allocation decisions under ideal conditions. However, in practice, the political implementation of such a levy may give rise to distortions and effects on the real economy.

Credibility that the levy will be imposed as a *once-only* measure seems to be key to ensuring that harmful distortions in the allocation of resources are kept to a minimum. While a government cannot guarantee that such a measure will be once only, it could contribute to the credibility thereof in a number of ways. First, the country's future "business model" must become apparent for the time after the levy; second, there has to be a basic level of confidence in the government and a firm belief that the budgetary imbalances were not actively caused by the government (eg real estate bubble that hardly anyone saw coming versus latent debt bias and nepotism); third, a verifiable outlook of sustainable public finances must be in place; and fourth, the political costs of a repeat levy must be high. Efforts could be made to actively raise the credibility of the consolidation process and wealth levy by considering these elements in the design thereof. Public acceptance of the levy is also likely to be dependent on whether it is seen as a complement to other consolidation measures that generally affect other groups of the society.

Furthermore, it is certainly of significance that imposing a one-off wealth levy in one country may trigger contagion effects in other countries. If these countries are experiencing a similar situation, market players may fear that a comparable levy will be imposed in their country, too. This could lead to distortions of allocation decisions, capital flight, tax evasion and, in certain circumstances, even migration.

The valuation of non-financial assets, such as business and real estate assets in particular, is time-consuming, costly and contested. It would probably also be necessary to spread the tax payments on illiquid assets over time, at least in some cases, which means that the reduction in gross debt would not take place in its entirety straightaway. Not least, the constitutionality of a one-off wealth levy with sizeable tax rates that is not imposed to manage the consequences of war or as a similar extraordinary burden is likely to be contested. Of course, opinions may change if the only other alternative available is a sovereign default.

Overall, it appears sensible to consider a one-off net wealth levy only in absolutely exceptional circumstances – however, the potential sovereign default of a country may well be considered such a situation.

Technical details on the implementation of the simulation in *FiMod*

The two scenarios in which households permanently or temporarily do not believe in the one-off nature of the wealth levy are technically implemented by modifying the consumption Euler equation as well as the equations for optimal capital investment (for a detailed description, see Stähler and Thomas, 2012). In concrete terms, this means that the equations for an investment in government bonds or international assets are modified as follows.

$$\begin{aligned}
\lambda_t^o &= \beta \cdot E_t \left\{ \lambda_{t+1}^o \cdot \frac{R_t - \mathbf{e}_t \cdot \tau_{t+1}^{wealth}}{\pi_{t+1}} \right\}, \\
\lambda_t^o &= \beta \cdot E_t \left\{ \lambda_{t+1}^o \cdot \frac{R_t^{ECB} \cdot exp\left(-\psi(d_t - \bar{d})/Y_t\right) - \mathbf{e}_t \cdot \tau_{t+1}^{wealth}}{\pi_{t+1}} \right\}, \\
Q_t &= \beta \cdot E_t \left\{ \frac{\lambda_{t+1}^o}{\lambda_t^o} \left[(1-\delta^k) Q_{t+1} + (1-\tau_{t+1}^k) \cdot r_{t+1}^k + \tau_{t+1}^k \cdot \delta^k - \mathbf{e}_t \cdot \tau_{t+1}^{wealth} \right] \right\}
\end{aligned}$$

where λ_t^o is the marginal utility from consumption in period t, β the discount factor, R_t^{ECB} the gross reference rate set by the central bank, R_t^{ECB} the gross reference rate on government bonds, π_t CPI inflation and τ_t^{wealth} the probability-weighted tax on wealth. $exp\left(-\psi(d_t - \bar{d})/Y_t\right)$ is the risk premium charged on international assets if the asset items deviate from their steady-state value (see Schmitt-Grohé and Uribe, 2003). For capital investments, the shadow price of capital, ie *Tobin's q*, Q_t, changes in accordance with the above description. Here it should be noted that investment income is taxed at a rate of τ_t^k, whereas capital itself depreciates at a rate of δ^k and these devaluations are exempt from tax.

At the time when the wealth levy is imposed, there is both a shock to the debt ratio and an additional shock to the way in which households form their expectations. Whereas, in the original steady-state equilibrium, households did not believe that a wealth levy would be imposed ($\mathbf{e}_t = 0$), once the levy has been charged for the first time, they attach a positive probability to a further wealth levy being imposed in the future, ie $\mathbf{e}_t = 1$. If the one-off nature of the wealth levy is permanently considered to be non-credible, the probability of repetition is permanently positive, whereas in the case of temporary non-credibility, it slowly declines via an *AR(1)* process in accordance with $\mathbf{e}_t = \rho^{wealth} \cdot \mathbf{e}_{t-1} + shock_t$, where $\rho^{wealth} \in [0, 1)$.[8] In principle, the latter presents us with a quick *ad hoc* way of approximating a learning algorithm. With a certain degree of probability, households therefore now expect their wealth to be taxed in the future.

The expected probability-weighted tax rate, τ_t^{wealth}, is calculated as follows. Households expect a wealth levy to be imposed again if the debt ratio again exceeds the level in the original steady state by 20 pp. The probability of this occurring is calcu-

[8] In this case, at time t, when the wealth levy is charged for the first time, $shock_t = 1$ and for all other times $shock_t = 0$. In the case where the wealth tax is permanently considered to be non-credible, $\rho^{wealth} = 1$. We chose $\rho^{wealth} = 0.96$ for the temporary non-credibility simulation.

lated in line with the theory on fiscal limits (see Corsetti et al, 2013). To be precise, the probability of that event, p_t, at a certain level of government indebtedness, b_t^g, will be given by the cumulative distribution fucntion of the generalized beta distribution $p_t = F_{beta}\left(\left[b_t^g/(1.2 \cdot \bar{b}^g)\right], a, b\right)$. $\bar{b}^g$ is the steady-state level of debt, and $a = 4.77$ and $b = 0.44$ are shape parameters matched to get a steady-state probability of 4% which increases at an increasing rate in the level of debt. The event is thus expected to occur roughly every 25 years (in steady state).

The tax rate that households expect to be charged on assets (capital, government bonds, international assets) in this case is high enough for the debt ratio, which has gone up by 20 pp, to be returned to the target value immediately (roughly 25%). Households factor this tax rate, multiplied by the expected probability of occurrence, into their Euler equations for their investment decisions, ie $\tau_t^{wealth} = p_t \cdot 25\%$. Put differently, this implies that households expect the quasi-investment income tax to be raised – although this never actually happens in the simulation.

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