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Government debt: causes, effects and limits

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Preface

The Coordinating Committee of the National Academy of Sciences Leopoldina approved the establishment and funding of an interdisciplinary working group on *government debt* in the fall of 2011. The subject has been – and remains – a topic of heated debate in politics, the media, business and the public and even between states. Many of the opinions voiced are not only controversial but also frequently based on dogmas, economic interests and false analogies. Two events added fuel to the public debate in Germany: the financial and economic crisis that started in 2007/08, followed by the debt crisis of some euro-area member states in 2010, and the amendment to the German constitution (still known in Germany as the Basic Law, or *Grundgesetz*) in 2009 to incorporate the debt brake. An interdisciplinary working group called “Government Debt in Democracies: Causes, Effects and Limits”, composed of the Berlin-Brandenburgische Akademie der Wissenschaften (Berlin-Brandenburg Academy of Sciences and Humanities) (lead), acatech – Deutsche Akademie der Technikwissenschaften (National Academy of Science and Engineering) and the Leopoldina – Nationale Akademie der Wissenschaften (German National Academy of Sciences), was formed for the purpose of helping to raise awareness of this topic among policymakers and the public by compiling and answering fundamental questions on government debt.

The topic is, however, also being debated hotly by academics involved in the subject. Each member of the working group brought to the table what Charles P. Kindleberger used to refer to as *strong priors*, i.e. they already had a strong opinion on the utility or risks of government debt. The plurality of views was very large, and an assessment of the members’ willingness to modify their positions during the discussion process in order to incorporate new information was very difficult. Some members of the working group wondered – not only at the beginning of our consultations but long into the discussion process – whether it would even be at all possible to arrive at a report on which all parties could agree. However, the participants’ interest in the topic and their willingness to reach a consensus on core takeaways from the different positions won the day over dogma for its own sake. Group dynamics played an important role in this process.

Usually, theories developed by individuals in any given scientific field are subjected to rigorous scientific discourse. Owing to the wide variety of opinions among the originators of these theories, this leads to the creation of competing schools of thought, i.e. groups of scientists who advocate similar or identical ideas. In order to be able to empirically test the purported and crucial cause and effect relationships in experiments or by observation, theories inevitably imply the need to sharply blunt the forces interacting among one another in the real world. Through model assumptions a whole bunch of parameters with real-world relevance are excluded from the observations, while describing and defining the environment in which the empirical examination of the causal link alleged in the model can be carried out. Due to the differences in the

model assumptions, schools of thought can co-exist even though, for instance, their positions in disputes are irreconcilable. Although the composition of the working group offered the ideal conditions to prompt this, it chose the previously described avenue.

The array of diverging opinions was documented during the course of a two-day international symposium on *Government Debt in Democracies: Causes, Effects, and Limits* which was part of the project that took place at the Berlin-Brandenburg Academy of Sciences and Humanities (BBAW) in late fall 2012.¹ Apart from members of the working group, presenters included renowned scholars and experts on the topic, such as, from the United States, Robert E. Hall (Stanford), Harald Uhlig (Chicago), Alan J. Auerbach (Berkeley) and Gauti B. Eggertson (Brown University), as well as Richard C. Koo (Tokyo) from Japan and Jakob de Haan (Groningen), Norbert Gailard (Paris) und Gernot J. Müller (Bonn) from Europe. The findings were published in a special edition of the *German Economic Review*.² The subject was also the topic of animated debate in a public lecture series of working group members over the course of four evenings from November 2013 to January 2014. Controversy was intentionally built into each evening by teaming up pairs of speakers with diametrically opposed views.

There are more than enough clashing points of view on the subject. Although this may make for stimulating discussions, it usually leaves the audience afterwards with the following impression: *We are still confused, though at a much higher level*. The working group wanted to go beyond the sound bites (some of which even scholars are guilty of) which are a staple of talk shows. It sought to reduce the widespread ignorance of, and confusion on, the topic among politicians, the media and the general public as well as to tear down stereotypes. To this end, we needed to practice what we preached by, as far as possible, reconciling dissenting opinions within the working group. We wanted to deliver a report that, with its consensus on core elements of the public debt issue, would help raise awareness and – as was the case within the working group during the compilation process – to overcome slavish obedience to orthodoxy.³

Apart from our specific recommendations (see the conclusion and executive summary), our main recommendation is that it is a bad idea to censor one's own – or anyone else's – opinions on the topic of *government debt*, and that, when the situation on the ground changes, it is usually a good time to revise one's position on the matter!

On behalf of the working group, I would like to thank the six reviewers of an earlier version of the report: Claudia Buch, Martin Hellwig, Kai Konrad, Manfred Schmidt, Jan-Egbert Sturm and Christian Waldhoff. They also made important contributions to the structure and content of the text. The working group discussed their suggestions and critical remarks in a day-long session and incorporated as many of them in the final report as possible.⁴

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Abstract

I. Background and objectives

1. The worldwide financial and economic crisis caused government debt to skyrocket. The German population, particularly sensitized by its experiences with two currency reforms, each of which followed a World War funded by government debt, was particularly spooked. Nevertheless, the ratio of general government debt to gross domestic product (GDP), or government debt-to-GDP ratio, has risen since the mid-1970s not only in Germany, but in almost all OECD countries, after having initially fallen after the Second World War or remained at the same low level. German reunification drove the government debt-to-GDP ratio up from 40 percent in 1991 to 60 percent in 1997.

2. The German government debt-to-GDP ratio rose by an additional 17 percentage points following the recent financial and economic crisis; this prompted the enshrinement of the debt brake in the German constitution in 2009. Yet this has failed to quell the public debate on government debt; it is being shaped by a confluence of fears, misjudgments and one-sided assertions. This report aims to clarify misconceptions held within the general public, fill knowledge gaps and shed light on what can be confusing discussion by presenting and explaining the existing evidence in economic, political and social sciences. Though confined to the determinants, the problems and the effects of government debt in the Federal Republic of Germany, this report does not ignore international influences, interdependencies and experiences.

II. General information

3. The public sector can finance its expenditure by imposing taxes and other compulsory payments or by borrowing. Revenues from other sources (private-sector activity, shares, privatization) are generally inconsequential. Borrowing produces follow-up costs in the form of interest due and possibly principal payments in future fiscal years. Traditionally – according to the so-called golden rule – only spending for productivity-enhancing investments should be funded by borrowing, as it enlarges the pot from which debt is serviced.

4. All private or public debt results from lending, and thus the creation of an equivalent amount of monetary assets, like two sides of the same coin. The increase in lending and debt can lead to economic progress if it is used for productivity-enhancing investments. However, the government is the only borrower which, because it has a monopoly on the use of force, can generate compulsory revenues by levying taxes. Seen from this angle, the general public is on the hook for public debt, which typically allows the government sector to borrow on capital markets at more favorable conditions than private debtors.

5. Governments borrow if current spending is not completely covered by current revenues. This borrowing, known as financial liabilities, constitutes the annual net new debt, which does not include borrowing meant for debt rescheduling or the rolling-over of loans from previous fiscal years. The net new debt and the loans for debt rescheduling and follow-on financing

together form gross new borrowing, the sum of which is much higher and needs to be authorized by parliament. The ratio of net new debt to gross domestic product is referred to as the deficit ratio. This is, however, different from the debt level, which is equal to the sum (positive and negative) of previous net new debt and forms the numerator of the government debt-to-GDP ratio.

6. Public financial liabilities are explicit, securitized debt obligations, in contrast to so-called implicit, hidden or prospective public debt. The latter refers to future legal intergenerational obligations incurred by the public sector, such as pension obligations for government officials. They also include future public sector payment obligations that cannot, however, be equated with explicit debt. Firstly, all legal obligations (laws on social security and welfare as well as on government subsidies), i.e. a large part of overall public expenditure, are actually implicit government debt. Secondly, future legal obligations can be modified by legislators – social benefits can be cut – while explicit government debt cannot be unilaterally modified, except for sovereign default.

7. In a macroeconomic perspective, the distinction between internal (domestic) and external (foreign) public indebtedness is very significant. In the case of domestic indebtedness, society as a whole is simultaneously both debtor and creditor (“*we owe it to ourselves*”). Government debt corresponds – either directly or indirectly through financial institutions – to creditor assets in the form of government securities and, in macroeconomic terms, both offset each other. Especially in the case of domestic indebtedness, government debt therefore differs substantially from the indebtedness of private individuals. What is more, government can impose compulsory levies on its citizens due to its monopoly on the use of force, and it holds a monopoly on determining legal tender.

Therefore, it can also use inflation as a means of taxation if it still has a national central bank which sets that country’s monetary policy. In a currency union such as the European Monetary Union (EMU), however, this is not possible, as the supranational and independent European Central Bank (ECB) sets monetary policy. Then again, none of this applies to foreign currency-denominated external debt; the public debtor is no better off than a private individual debtor.

III. Determinants of government debt

8. Government debt is said to perform three functions: 1. a stabilizing function, 2. a bridging function and 3. a burden-shifting function. To stabilize the macro economy, government should pay down debt when the economy shows signs of overheating and should be willing to run up additional debt to fight recession. In Germany it is primarily “automatic stabilizers” such as unemployment insurance or the (personal) income tax which come into play. The bridging function describes the goal of tax smoothing. The state should not change tax rates in the short term, e.g. in the case of a cyclically-induced drop in revenues or a temporary rise in spending in response to a disaster, but should then temporarily finance its spending through borrowing. Finally, if the benefits created through spending in the current fiscal year also benefit future taxpayers, then tax burdens should be shifted and spread over time. Public investment can therefore be funded through borrowing (under the *pay as you use* principle). But the extent to which the performance of these three functions of government debt can explain its actual development remains questionable. However the influence of financial and banking crises, whose fiscal costs caused government debt-to-GDP ratio to skyrocket, especially after 2008, is undoubtedly significant.

9. Government debt in modern democracies is influenced mainly by (socio)economic factors such as economic growth, economic cycles, banking crises, wars or demographic change. In addition, there are also political elements specific to constitutional democracies. The politico-economic approach essentially rests on the premise that government debt – by shifting tax burdens to the future – is capable of reducing the political costs of funding government spending, as it is difficult for individual taxpayers to make an exact assessment of future tax burdens (known as the “fiscal illusion”). What is more, future tax liabilities for debt servicing matter less to older voters since their life expectancy is lower than that of younger voters. However, it seems rather unrealistic to assume that voters fully take into consideration these future liabilities (Ricardian equivalence proposition). On the other hand, there is no empirical evidence that elections cause a short-term spike in government borrowing or that left-wing parties are particularly inclined to increase public debt. It has, however, been asserted that, in fragmented political systems composed of coalitions comprising many parties, it is especially difficult to reduce government debt. If the finance minister and head of the executive branch of government have a strong position, this will tend to dampen government debt.

10. Changes in social values and mores have had little impact on government debt growth. It also cannot be proven that, as is often assumed, the welfare state is responsible for the rise in government debt. Though social welfare spending makes up a large chunk of the public budget, this says little about how it is financed, i.e. through borrowing or levies and taxes.

IV. Economic limits of government debt

11. In order to cap government debt, policymakers need to know how sustainable

the debt is. The deficit ratio and the government debt-to-GDP ratio, both of which have GDP in the denominator, are the most important indicators. An additional central indicator is the primary balance of the public budget – the difference between revenues and expenditures of the current budget, excluding interest payments on spending and asset sales on the revenue side. If the primary surplus exceeds interest payments, the debt will fall. If it is lower, or if a primary deficit exists, the opposite applies.

12. As the role of GDP as the denominator is the decisive metric, the real interest rate over GDP growth is the main determinant of sustainability. As long as the real interest rate exceeds GDP growth, a permanent primary surplus will need to be generated in the long run in order to service interest payments. On the other hand, a long-term primary deficit in the public budget is possible only if real GDP growth outpaces the real interest rate. The jury is still out on how the interest rate to growth ratio will unfold, even though without it, no meaningful assessment of whether or not to increase government debt is possible.

13. It is not possible to define a set threshold percentage above which the government debt-to-GDP ratio negatively impacts economic growth. Furthermore, the cause-and-effect relationship is not clear: does high government debt impair growth? Or does low or negative growth increase government debt? Again, the jury is still out here.

14. Public investments also affect the sustainability of government debt, as they can increase the productivity of private sector activities and thus promote economic growth. Empirical research on whether public investment is more or less productive than private investment is inconclusive and controversial. Furthermore, productivity also depends on the stock and quality of the infrastructure.

Nevertheless, there is a preponderance of evidence to indicate that Germany needs public investment, especially as net government wealth has probably diminished significantly since the early 1990s.

15. Demographic trends will affect public budgets going forward. The surge in the 65-and-up population will lead to increased spending on social security benefits and pensions. The amount of fiscal consolidation necessary in this area will depend on two factors: the evolution of the interest rate to growth ratio and future laws and regulations governing social security and pension entitlements. The extension of entitlement programs, such as the increases in retirement benefits recently passed by Germany's "grand coalition" government, will widen the sustainability gap of public finances, which will need to be closed at a later stage through renewed budget cuts.

V. Burden shifting as a distribution problem

16. The widespread claim that future generations will pay for government profligacy is generally based on an analogy between private and government budgets. Individuals can borrow in the present in order to finance expenditure and pay off their debt and interest later in the future. This makes particular sense when the benefits from use also accrue (e.g. when buying a house) at a later stage. The analogy is useful for external government debt, i.e. borrowing from non-residents in domestic or foreign currency. However, it does not hold for internal debt. In a given period, one can only consume what is produced. This means it is impossible to transfer the debt burden to future generations. Creditors and debtors are, macroeconomically speaking, each part of the same generation.

All the same, there are three instances in which future generations may have to foot the bill. (1) If debt-fund-

ed government consumption spending crowds out private investment. This diminishes future generations' potential output, particularly in the case of full employment. (2) One school of thought rejects the macroeconomic aggregation of multiple generations and views bondholders and taxpayers separately. Bondholders acquire securities by choice, whereas future generations of taxpayers cannot opt out of paying taxes. (3) As the generations overlap, cutting taxes today particularly benefits those who will not have to foot the bill later on. The extent of these three burden-shifts is empirically uncertain and fraught with controversy.

17. The effects of government debt on the interpersonal income distribution are totally unclear. This is the case, because holders of government bonds and taxpayers overlap. There is no empirical research on the actual effects so that overall, no conclusive statements can be made at this stage.

VI. Effects of government borrowing

18. High government debt-to-GDP ratios have often given rise to fears that the government will (hyper)inflate away its debt by printing money. Such fears are particularly prevalent in Germany. However, the legal and institutional regulations governing the European Union explicitly prohibit the printing of money in order to finance government spending. As the primary objective of the independent ECB is to maintain price stability, indebted governments have to cope with government debt by reining in spending instead of through monetary policy measures.

19. Numerous studies on the extent of multiplier effects of an expansionary fiscal policy during a financial crisis have shown that the effect of debt-funded government spending on growth and employment

depends greatly on the specific economic conditions, chiefly the effectiveness of monetary policy, the exchange rate regime and the cyclical situation. The multiplier effects during a recession are significantly larger than during boom times and are highest when the increase in spending during recession is financed through spending cuts during the next boom. The multiplier effect is smaller if the initial government debt-to-GDP ratio is high. The concept of expansionary consolidation, according to which drastic austerity measures in times of crisis could possibly even lead to an increase in economic activity, should, however, be viewed with skepticism.

US their impact on overall debt has been negligible, in Switzerland they have been a lot more effective – probably largely due to the underlying political consensus shared by all parties involved in a referendum-based system of direct democracy.

VII. Legal constraints on government debt

20. In 2009 the so-called debt brake was signed into law, superseding Art. 115 of the German constitution. Under the old provision, in force since 1969, government investments usually capped the net new debt (known as the “golden rule”). However, this limit could be breached “to avert a disruption of the macroeconomic equilibrium”. The 1992 Maastricht Treaty set the annual net new government borrowing limit at 3 percent of GDP and the limit for (gross) government debt at 60 percent of GDP. Despite some modifications and additions, these limits still stand. The debt brake of 2009 is composed of three elements: the general principle of zero net new borrowing; a clause which flexibly adapts borrowing and amortization to the business cycle; and an exemption.

21. The German debt brake is largely modeled along the lines set out in the Swiss constitution, whereas the Swiss cantons use their own fiscal rules, which are quite different. Individual US states also have various types of fiscal restrictions in place. The success record of statutory debt ceilings is mixed, however. Whereas in the

1. Introduction

1.1 Background of the report

The global financial and economic crisis caused government debt to shoot upwards rapidly, spooking the German public. Many citizens associate high government debt with the threat that their hard-earned money will be expropriated, either through taxation at extortionate rates or high inflation followed by a currency reform. The Germans experienced a currency reform twice in the first half of the 20th century, and this experience is still seared into the collective memory. Many Germans are more worried about the rise of government debt-to-GDP ratio⁵ (chart 1) than nationals of most other countries.⁶

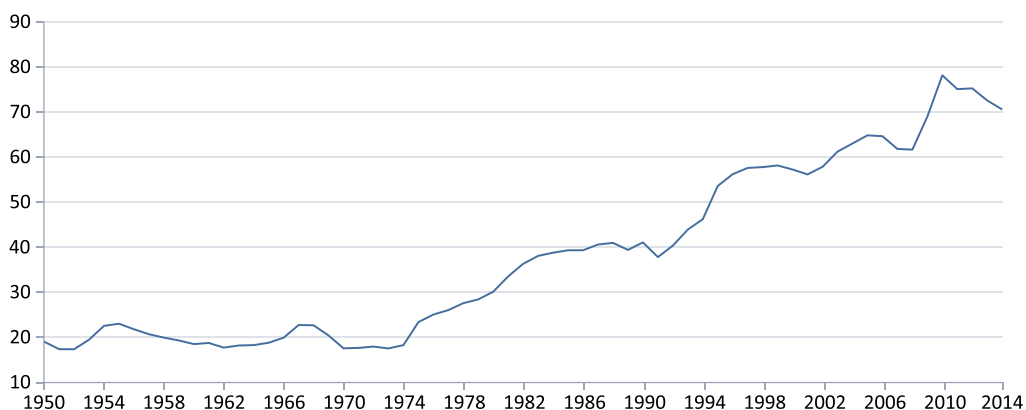
Since the mid-1970s, government debt to gross domestic product (GDP) has been on the rise, not only in Germany, but also in most OECD countries. This followed a quarter-century in which the ratio had either fallen significantly, as in the USA, or had held steady at a relatively low level, as was the case in Germany whose

punishing World War II debts had been pulverized by the 1948 currency reform and the London Debt Agreement of 1953.

The rising government debt ratio in all industrialized nations since the mid-1970s is not necessarily only due to domestic developments. Economic and political factors, as well as institutional structures, can lead to rising gross debt and can therefore increase the ratio. Slower GDP growth rates or even contraction can influence the government debt ratio just as much. At any rate, overall debt grew faster than GDP, leading to an increase in the government debt ratio. In response, economists and fiscal experts increasingly examined the sustainability of public finances.⁷

The rise of government debt had political repercussions. In his successful run for president in 1980, Ronald Reagan – like other fellow Republican Party politicians before him – assailed President Jimmy Carter’s record federal budget deficit, only

Chart 1: General government debt, Federal Republic of Germany (FRG) 1950 – 2014
% of nominal GDP



Sources: Statistisches Bundesamt (2105a, 2015g).

to run up much higher deficits and deficit ratios during his presidency (1981-1989).⁸ During the Clinton era (1993-2001), the US was able to reduce its debt ratio from 64 percent at the end of 1994 to 54 percent in 2000. Owing to decisive budget cuts, from 1998 to 2001 Clinton and Congress ran budget surpluses for the first time since 1969. Rapid productivity and economic growth were essential. Conversely, the US recession from 1989 to 1993 drove the quota up from 50 percent at the end of 1988 to 64 percent at the end of 1993.⁹

In Germany the coalition between the Social Democrats and the Free Democratic Party under Chancellor Helmut Schmidt also came under attack for high budget deficits by his Christian Democratic Union challenger Helmut Kohl in the 1980 election campaign and in debates in the Bundestag. Fiscal consolidation was one of the main objectives set out in the “Lambsdorff Paper,” a seminal policy paper which brought down the center-left coalition. As chancellor since 1982, by curbing government spending Kohl was able to take advantage of a phase of strong economic growth to consolidate public finances despite tax cuts. However, the costs of reunification, funded mainly through government borrowing, drove Germany’s deficit and debt ratios back up during Kohl’s tenure as chancellor. Awareness of the importance of government debt was additionally increased by the signing of the Maastricht Treaty on 7 February 1992, containing national fiscal rules which paved the way for the European Monetary Union (EMU).

In the aftermath of reunification, Germany’s government debt-to-GDP ratio rose from 40 percent in 1991 to 60 percent in 1997. It subsequently remained at around 60 percent until 2001 before going up a further nine percentage points by 2005 during a period of weak economic growth. This caused Germany to breach the deficit and debt criteria of the Stabil-

ity and Growth Pact. Only following a period of economic recovery from 2005 to 2007 did Germany’s fiscal deficits go back down¹⁰, with the government debt-to-GDP ratio falling by more than three percentage points.

In the summer of 2007, the worldwide financial crisis erupted, followed by the Lehman bankruptcy on 15 September 2008 and, on its heels, the Great Recession; the bottom fell out of the economy and employment tanked. Fiscal revenue and expenditure all over the world went off-kilter, with deficit ratios hitting peacetime record highs. The recession, government stimulus programs and the assumption of the “toxic assets” offloaded onto “bad banks” (corporate structures set up to isolate illiquid, high-risk assets as part of measures to rescue distressed banks) caused government debt ratios to jump sharply from 2008 to 2010: e.g. in Germany by 17 percentage points,¹¹ in the US and Great Britain by 30 percentage points and more. This put the debt question squarely back on the political agenda and brought it to the center of attention in the media, the general public and academia.

In Germany this unexpected dramatic increase in the ratio set the stage for enshrining the debt brake in the German constitution in 2009 as the right-left Grand Coalition between the CDU/CSU and the SPD was nearing its end. Negotiations on the revision of the old statutory debt limits under Art. 115 of the Basic Law in conjunction with Art. 109 of the Basic Law had already begun prior to the financial crisis as part of the second stage of the reform of the federal system (Föderalismusreform II) – more accurately following the conclusion of the first reform of the federal system (Föderalismusreform I) in 2006. However, neither the national nor any of the Federal states’ “debt brakes” would have been politically deliverable if government debt had not skyrocketed during the crisis.¹²

Books by economists on government debt and the history of debt crises began to fly off the shelves.¹³ The debt crises which afflicted some southern European euro-zone countries and Ireland since 2010 and the ensuing stimulus packages and bailouts unsettled the German public even more and stoked the debate on debt even further.

1.2 Objective of the report

Uncertainty and fear, as well as public and political interest in the topic of government debt, are considerable. At the same time, the debate has been characterized by a series of misconceptions and one-sided assertions, often guided by financial and political interests. This has added to the confusion in the debate on government debt. Our report seeks to help close these knowledge gaps, to provide guidance in a fog of superficial rhetoric, and hence, to educate the reader.

Given the wide variety of causes, problems and effects of government debt in different countries and political systems throughout the world, however, we found it necessary to focus on the issues germane to Germany. We have chosen not to address the problems of government debt that are specific to dictatorships and authoritarian systems, nor will we go into government debt in the developing and emerging world (which means we will not cover the crises in Mexico and Argentina). The report is based on the conditions of a western-style constitutional democracy. However, this does not preclude international influences and interdependencies. It just means they will only be considered inasmuch as they affect the Federal Republic of Germany. This perspective will also confine our treatment of the euro-area crisis to those aspects which directly concern Germany. We will therefore not address the specific causes and problems of government debt in Greece, the other southern countries or Ireland.

Apart from this, our interdisciplinary working group sought to compile the present level of knowledge from economics, political science and social sciences for the general public, the media and political decision makers in a comprehensible form and to extract from it political recommendations. In this sense, the report reflects consensus but also some dissenting voices within the group.

In section 2 of this report we will analyze some of the basic questions that help to define, classify and distinguish between government debt and private debt. Section 3 discusses determinants of the rise in the government debt-to-GDP ratio, covering traditional economic explanations of government debt, the impact of financial crises and the influence of democratic and cultural factors. Section 4 is devoted to an in-depth discussion of the criteria for government debt limits and ends with preliminary findings. Section 5 looks at how government debt is used to shift burdens, i.e. how it impacts on the distribution of income and wealth between individuals and between generations. Section 6 discusses the effects of public borrowing on price movements (inflation) as well as on output and employment (multiplier effect of expansionary and contractionary budget policy). Section 7 assesses the effectiveness of statutory fiscal restrictions. Section 8 presents the conclusions and recommendations of the working group.

2. General information

2.1 Debt as a form of government financing

There are several different ways for government to finance its expenses: taxes, charges, compulsory contributions to social security and other government facilities, proceeds from its private sector activities, shares in companies, profits transferred from the central bank, income from privatization, etc. If it finances its spending through borrowing, this incurs follow-up costs, just as is the case with private debt, i.e. the interest and principal payments due in future fiscal years. Since at least the second half of the 19th century, an old financing rule of thumb in the public sector (as in the corporate sector) has been: spending which increases the economy's productivity in future fiscal years by at least the amount of the additional increase in debt service can be financed through borrowing. In all German constitutions between that of the North German Confederation (Norddeutscher Bund) of 1867 and the 2009 amendment to the Basic Law ("debt brake"), government borrowing limits were, in one way or another, guided by this rule.

2.2 Debt and monetary assets

Financial assets and financial debt are two sides of the same coin – one person's borrowing is another's lending. Increasing borrowing and debt can also facilitate economic progress if they are used for productivity-enhancing investments.

In the past, the growth of lending business did indeed lead to significant

increases in prosperity. In his 1776 book *The Wealth of Nations*, Adam Smith explained that productivity gains resulting from the division of labor were the primary reason why nations became wealthy. Since the *Industrial Revolution*, this process has been significantly accelerated by innovative entrepreneurs investing in real capital in the form of mines and factories, transportation and many other sectors. This has resulted in uneven levels of income growth, with only part of the gains being spent immediately. The rest is saved, i.e. accumulated in the form of financial assets. For these assets there exists a corresponding volume of financial liabilities, which are incurred mainly by non-financial corporations to finance their investments. To some extent they are also incurred by households for real estate investments and by governments and non-residents when they borrow from the pool of domestic savings.¹⁴ Banks, insurance companies and other financial institutions are the intermediaries, i.e. they direct the savings of the national economy to the above-mentioned sectors, unless depositors take direct action by buying government bonds, stocks and other equity stakes, corporate bonds or the like.

In the circular flow model, saving and investment (including that of domestic residents abroad) automatically revert to parity *ex post*. However, the savings and investment plans can diverge significantly *ex ante*, as the decisions are made by different sets of people. If savings exceed planned domestic investments, there are two ways to close this gap. One is through capital exports, i.e. through current account surpluses, which Ger-

many has been consistently running over the last ten years. The other is through involuntary investment in inventories of non-selling goods or through the reduction of savings due to falling prices, salaries and interest rates. If the planned domestic investments exceed planned domestic savings, an inverse offsetting mechanism is set in motion: the current account runs a deficit, and prices, salaries and interest rates go up. The more the financial sector contributes to closing the gap between planned savings and investments – depending on the ratio between the two – e.g. through finding new investment opportunities or through acquiring savings from abroad, the more it helps to stabilize GDP growth.

Creditors earn interest income from lending financial assets for which they currently have no better use. This is also advantageous for the debtor: At the expense of interest payments he can finance purchases which his present income and savings alone would not allow him to afford, e.g. in case of a private household the loan-financed acquisition of a home, a car or the first-time furnishing of an apartment. The part of the in-

come that other households set aside, e.g. for retirement funding, is thus directed to households wishing to make purchases before saving enough of their income to do so without borrowing. Both sides of the loan benefit, as long as the borrower earns enough to repay the loan. If the corporate sector, the government sector or non-residents borrow, they can spend in excess of current revenues and savings. The lenders will, if possible, want the additional spending to increase productivity so that their borrowers will be able to service the debt comfortably. Due to these ongoing “pull-forward effects,” the entire economy sees increased activity coupled with increased productivity growth.

As a borrower, government plays a special role in this credit interaction between private households, enterprises and non-residents. Due to its monopoly on force, it is the only sector that can levy taxes on its citizens and thus expropriate income. As ultimately all citizens as a whole are liable for servicing public debt and this can be enforced by legislation, general government is often in a position to borrow on the capital market at more favorable terms than private borrowers.

Box 1: The history of parliamentary budget rights

The early modern nation state had a fund-based economy which allocated individual revenues to specific expenditures; as the concept of an overarching uniform budget was unknown, government debt as defined today could not exist. Rulers borrowed by incurring private debts with corresponding risk premiums on the interest rate. Only the consolidation of government debt in England at the end of the 17th century redefined public borrowing. Due to their right to authorize taxes, parliaments gradually gained more and more control of – and responsibility for – overall public finances. The UK Parliament was the first in Europe to gain full power to approve spending and borrowing in addition to taxation¹⁵ following the *Glorious Revolution* of 1688, when the new king William III needed funds to pursue a war with France. The French Revolution in 1789 provided the breakthrough in France. In Germany the ball only started rolling in this direction (in Southern Germany) after Congress of Vienna in 1815. The parliaments of Bavaria, Baden and Württemberg had the right to approve taxes and the right to audit spending and the budget, but not the right to approve spending. All the same, new government debt required their approval.

In Prussia such parliamentary rights of approval only prevailed later. In the government debt law of 1820 the Prussian king promised a constitution for the third time,¹⁶ pledging that new government borrowing would be subject to approval by a representative body of the nation state. As revenues were on the rise and the government was being operated frugally, however, this ended up not being necessary until the mid-19th century. Therefore only eight provincial diets without rights of approval for the whole nation state were set up in Prussia in 1823. The united provincial diets established in 1847 were not a representative body of the nation state under government debt law. It was only in the aftermath of the revolution of 1848/49 that Prussia established a parliament with the right to approve taxation and budgets as well as the authority to legislate government bonds into existence. With parliamentary assistance, the wealthy bourgeoisie ended up being put on the hook for government debt.

The German parliaments in the pre-March era (Vormärz), as well as in Prussia after 1850, were mainly bicameral entities in which the first chamber was dominated by the nobility, the clergy and high government officials. The second chamber – which actually represented the people – was initially populated by the bourgeoisie or middle class. Only gradually did universal male suffrage prevail in the 19th century, giving the government (limited) democratic legitimacy through adult (male) citizens. In Prussia there was even a three-class franchise system, representing general but biased suffrage. At the Reich level there had been a general und universal male suffrage since the adoption in 1867 of Constitution of the North German Confederation and the establishment of the German Reich in 1871. The Reichstag had the unrestricted power to approve taxation and budgets, including the right to approve by law the issuance of government bonds. This established the democratic legitimacy of government debt and also fundamentally changed the balance of power: parliament went from being a mere protector of the interests of the wealthy bourgeoisie which curtailed government debt through the (monarchical) executive branch to becoming an important decision-maker in its own right with the power to increase government debt as well.

2.3 Types of government debt

In the general public debate on the complexities of government debt, hardly any distinction is made between the different forms of debt. The catch-all term “government debt” masks its various forms and the significant differences in the effects and hazards of the various types.

Government debt is the financial debt accumulated by the government sector through borrowing¹⁷ and the issuance of bonds, treasury bills, treasury bonds and similar instruments. Governments borrow funds in this fashion if current spending is not completely covered by revenue. If regular expenditure exceeds non-credit revenues, this gap has to be financed through borrowing. Funding raised in this manner, unless earmarked for debt rescheduling or rolling over loans from previous fiscal years, constitutes annual net new debt. The net new debt and the loans for debt rescheduling and follow-up financing together form gross new borrowing which is much larger and requires parliamentary approval. The ratio of net new debt to gross domestic product is referred to as the deficit ratio. This is, however, different from the debt level, which is equal to the sum (positive and negative) of previous net new debt. Divided by GDP, it becomes the government debt-to-GDP ratio. As government borrowing does not mature all at once¹⁸ and the debt level by far surpasses the net new debt, there are constant transactions of (gross) debt relief and (gross) new debt. Whereas under fiscal law the gross principle generally applies, meaning that all gross transactions are recognized, as opposed to the balance of spending and revenues, this is not always the case for debt.¹⁹

Although gross new debt requires parliamentary approval under fiscal law, it is not an additional burden for the capital market, but merely a redistribution of existing debt. The net new debt,

which in itself can impose an additional burden for posterity, is the yardstick for setting the debt brake. Furthermore, it is vital to avoid the misconception that the difference between gross and net new government debt, as is the case with private sector debt, is defined as what is left over excluding, or after deduction of, assets. Such balancing is harder to achieve for government debt than in the private economic sector, as there are generally no market prices to value government assets.²⁰

Financial debt is explicit, secured debt, as opposed to implicit, covert or prospective government debt. These are defined as the government’s future, and thus intergenerational, legal obligations, and can be accounted for in the so-called generation balance. Pension obligations for government officials are a prime example. Just like interest and amortization obligations, they include the government’s future payment obligations. However, they are not the same as explicit government debt, for several reasons.

Firstly, there is a problem of definition. Technically speaking, all legal obligations, from social welfare legislation to statutory future economic subsidies to civil service salary and pension payment obligations constitute implicit government debt in this sense. This means that a large part of the government’s annual budget has the purpose of servicing government debt. Secondly, explicit government debt is generally legally binding and can only be unilaterally abrogated in the event of a sovereign default. By comparison, although the government cannot fully dispose of its legal obligations for the future, it can certainly modify them. Pension obligations as well as social benefits can be cut in the future. A long-term fiscal policy must therefore take into account implicit government debt, but it needs to be treated differently than explicit government debt.²¹

Financial debt can also be classified in various forms. A breakdown by different forms of debt, whose most salient criterion is the term, is less important. Here, the breakdown would be between short-term (up to one year), medium-term (up to four years) and long-term (over four years) debt. The other forms of debt (liquidity, interest, or amortization) can be disregarded.

The distinction between internal national debt (owed to residents) and external national debt (owed to non-residents) is macroeconomically very significant. If a national government is internally indebted, society as a whole is both creditor and debtor at the same time; we can sum this up as *“we owe it to ourselves”*²². Government debt corresponds with creditor assets, held as government securities; in macroeconomic terms, they offset one another. This does not apply to external debt, as the creditors are external third parties. A further differentiation is needed, this time between government indebtedness to non-residents, when the government borrows in foreign currency and possibly in another jurisdiction, and borrowing in its own currency under national law. Hence, particularly in the case of liberalized capital accounts, non-residents can freely buy government debt on the secondary market, something over which the government has no control. Indebtedness within the Eurozone is an intermediate form. Member states borrow under national law, but in a currency over which they have no sovereign jurisdiction, as monetary policy is set by the ECB, and no longer by the national central banks.

2.4 The views of the British Classical School until 1820 and impact of public-finance classics on German economic thinking after 1855

Since the 18th century, economists in states ruled by absolute monarchs as well as in states with parliamentary constitu-

tions have been debating when, and if so why, the government should go into debt, as well as how much. The government’s role in the economic process has been shaped by the prevailing conventional economic wisdom, perceptions about the ideal size of government and contemporary historical experience with government debt. The British Classical School theorists – from David Hume to Adam Smith and David Ricardo – held that government debt would lead to the “ruin” of the national economy.²³ Such government spending to them represented waste, taking away funds from the capital market and hence slowing down private investments, and were definitely unproductive – as, to them, were all services, even those provided by the private sector of the economy. The assessment that government debt would necessarily lead the national economy to ruin contradicted the fact that Great Britain, with a government debt of almost 300 percent of estimated gross national product (GNP) after the Napoleonic Wars, went on to become the world’s leading industrial, trading and financial power in the 19th century.

German public finance economists – from Carl Dietzel to Lorenz von Stein to Adolph Wagner – developed a completely different outlook in the second half of the 19th century. In 1855 Dietzel, in particular, held that the rapid growth of British government debt since the Glorious Revolution of 1688–89 was a crucial cause for the rise of the British economy to leading world power. This revolution ended the era of British absolutism and permanently established Parliament as the center of power – including fiscal power. Dietzel and other German financial economists recognized the productivity-enhancing effect of not only private services but especially of public services in all areas where the private sector could not cope. Typical examples are internal and external security, the education system, an efficient legal and also judicial system and

the attendant enforcement and safeguarding of property rights. In this context the term “immaterial capital” was coined; without creating and growing it, part of the national economy’s production potential would remain unused. These economists held that the same would apply to material investments in large-scale infrastructure projects, the capital requirements and earnings risk of which would be prohibitive for the private sector.

A typical example mentioned in this respect is the building of a railroad in the second half of the 19th century with government guarantees and assistance. Without it, the economy would have remained below its actual path of productivity according to all research findings available today. Other examples include expansions to underground drainage systems and other municipal infrastructure elements (roads, water supply, sewerage, and later power stations and electrical trams). The German public finance economists recognized that governments should be permitted to borrow in order to fund all public, productivity-enhancing investments in government-owned firms, in “immaterial capital” and in the associated material projects (such as school and court buildings), or to fund projects where the costs and risks are too big for the private sector to bear. This applies to all “extraordinary” spending that would mean a higher than “ordinary” spending in the current period and an increase in economic productivity, and thus tax revenue, from a larger national product or a decrease of current ordinary government expenditure in the future. They held that such public borrowing would enlarge the economy’s productivity reserves and would pay for itself. This thinking has been written in some form or another into all German constitutions since that of the “Norddeutscher Bund” (North German Confederation) of 1867 and the German Empire which was established in 1871.

2.5 Differences between private and public debt

In 1863 Adolph Wagner, a German economics professor, member of the “Kathedersozialisten” (academic socialists) school of thought and forefather of public finance in Germany, postulated the principle that “in the public budget, revenue should be based on expenditure, unlike in private budgets.”²⁴ However, he added that principles for the amount of public expenditure were needed to prevent spending and taxes from rising indefinitely.

A further difference results from the national government’s monopoly on force. This does not only exist regarding internal and external security, but also in the area of taking money from the public by force (taxes, charges, social security contributions, etc.) as well as declaring specie issued by it or banknotes issued by its central bank as legal tender, thus forcing creditors to accept it as payment. That is why – unlike households and individuals – it cannot, technically speaking, become bankrupt: in extremis, it can always impose an “inflation tax”.²⁵ This does not apply, of course, to a supranational currency such as the euro, as every member state borrows in a quasi-foreign currency and no individual member state can independently manipulate the euro’s value. Therefore, those who invest in Eurozone member states’ government bonds face an implicit risk of sovereign default.

If the income of individual households shrinks, their only remaining option will therefore be to reduce their spending. Firms also introduce cost-cutting measures if their revenue falls. As this is an integral part of structural economic change, with losses for some and gains for others, the retrenchment measures taken by some firms and individuals can be seen as individual adjustments that do not impact on overall economic demand and hence on economic growth and employment. If,

however, in a state of general crisis, all or most households and firms expect losses in income and revenue and subsequently introduce savings policies in order to stave off insolvency, this would impact adversely on aggregate growth. In economic theory this is known as the “paradox of thrift”, a real-world example of the “fallacy of composition”: although individual insolvency can be prevented by saving, mass collective thrift can be bad for the economy as, for instance, widespread job losses and salary cuts can worsen the overall economic crisis. The collective austerity measures of many private sector firms and households then no longer bring about recovery, but can, due to declining demand, launch the economy into a downward spiral of negative growth.²⁶

3. Determinants of the increase in government debt-to-GDP ratio

3.1 Traditional functions of government debt

Government debt has traditionally performed three functions: 1. the stabilizing function, 2. the bridging function and 3. the burden sharing function.²⁷ However, this does not factor in the government's function of providing precautionary services to individuals.

1. Stabilizing function: Particularly in times of crisis, the government is responsible for stabilizing the economy. In this situation, a balanced budget every year should not be the goal. Instead, fiscal policy primarily needs to contribute to balanced economic growth, i.e. to reduce government debt when the economy shows signs of overheating and to allow an increase in government debt when the economy is underperforming.²⁸

If slower economic growth or a cyclical downturn costs the government certain expected revenues from taxes and social contributions, and if the government reduces its spending accordingly, this would lead not only to increased private sector saving but also to an intensification of adverse effects on aggregate demand, i.e. on growth and employment, given that the German government's share of the economy's income flows is some 50 percent of GDP.

The national government can discharge its responsibility for economic stabilization by, in times of crisis, not cutting spending and/or increasing taxes, i.e. renouncing a balanced budget policy, but instead allowing "automatic

stabilizers" to work, which are particularly pronounced in Germany.²⁹ It can also tackle a recession by means of a discretionary increase in government spending in order to support future economic growth and prosperity, by making investments which are sustainable in the long term and stabilize economic growth. An investor-friendly tax system could also serve this goal.

2. Bridging function: It describes the aim of *tax smoothing*. Walter Eucken pointed out in his "*Grundsätze der Wirtschaftspolitik*" (*Principles of Economic Policy*)³⁰ that *consistency* in economic policy was necessary to start off sufficient investment activity for economic growth and employment. "The long-term setting of taxes... is of considerable significance." (p. 176) Only in this manner could an "atmosphere of trust" be created in which entrepreneurs could plan and calculate investments, including those that only pay off 15 to 20 years down the road.

Taking into account these considerations and because other market participants, e.g. consumers, would suffer efficiency losses, it does not make sense to raise or lower taxes during economic crises or whenever unexpected events cause sudden tax shortfalls or temporary increases in expenditure. In such cases, public expenditure should temporarily be funded through borrowing instead. Conversely, governments should run surpluses in good times in order to comply with the *intertemporal budget constraint*. Constantly changing tax rates would entail aggregate welfare losses.

3. *Burden sharing function*: It distributes tax burdens over time. It should always apply when the utility created by spending in the current fiscal year benefits taxpayers in future fiscal years as well. In this case, taxpayers in the current period should not have to pay the total costs of such government activities; future taxpayers should also contribute in line with the benefits they derive from the previous period's expenditure (*pay as you use*). Through debt financing they can participate in the project costs, as they then will have to finance the debt servicing (interest and amortization) by paying current, ongoing taxes. Typical examples include public investments, which increase the efficiency of the economy in the long term but cause temporary budget deficits. It is a question of an "equitable" sharing of burdens between (taxpayers across different) generations. The political scientist Lorenz von Stein already got to the heart of this principle in 1871 by writing that "A government without government debt is either doing too little for its future, or asking too much from its present."³¹

The *golden rule* that government borrowing cannot exceed its investments is based on this thinking. Due to numerous problems of measurement, definition, depreciation and other issues, this rule and consequently also the "*pay as you use*" principle were removed from Art. 115 when the Basic Law was amended in 2009 (to introduce the debt brake).

In March 2007 the "Sachverständigenrat zur Begutachtung der gesamtwirtschaftlichen Entwicklung" (German Council of Economic Experts), in its expert opinion commissioned prior to the amendment of the Basic Law in 2009, recommended maintaining a modified version of the Golden Rule, e.g. to only fund net public investments and not gross investments through borrowing.³² The "Wissenschaftlicher Beirat beim Bundesministerium der Finanzen" (Scientific

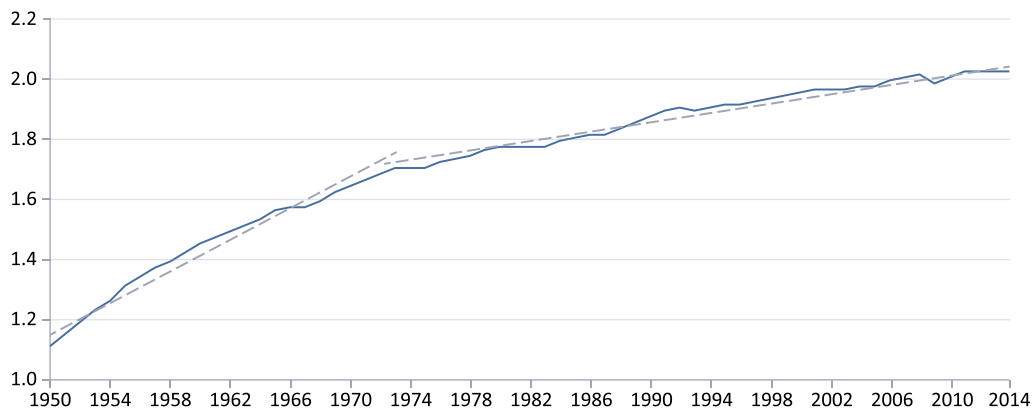
Advisory Council to the Federal Ministry of Finance) had already voiced its opposition in a letter to then-Finance Minister Peer Steinbrück dated 10 February 2007. On 9 July 2007 the Federal Constitutional Court ordered the German parliament to pass a more effective debt limit than that contained in Article 115 of the Basic Law, which had been in force since 1969. Section 1, sentence 2, according to which "The revenues from credits cannot exceed the sum of the spending on investments foreseen in the public budget; exceptions are only permitted to prevent a macroeconomic imbalance," had "not proven to be effective in reality."³³ The "Wissenschaftlicher Beirat beim Bundesministerium für Wirtschaft und Technologie" (Scientific Advisory Council to the Federal Ministry of Economics and Technology) was asked for its expert opinion and, in its report of January 2008, also came out against the *golden rule*, particularly because "the separation between public investments and public consumption as well as the definition of real investments for the most part [would be] arbitrary. From an economic perspective many types of spending, from road building to the "BAföG" (Federal Education Assistance Act), to external security could be seen as investments, as in each case future generations could benefit."³⁴ However, all three expert councils unanimously agreed that the invitation to raise government debt to finance public consumption and transfer spending through borrowing "to prevent a macroeconomic imbalance" should be abolished.

3.2 Actual growth

To what extent the perception of these three functions of government debt can explain its actual growth is, however, questionable. Chart 2 plots the growth of Germany's real GDP from 1950 to 2014. Chart 3 shows the development of the unemployment rate. Both illustrations suggest that the impetus for increasing the general

Chart 2: Real GDP growth (log), FRG 1950 – 2014

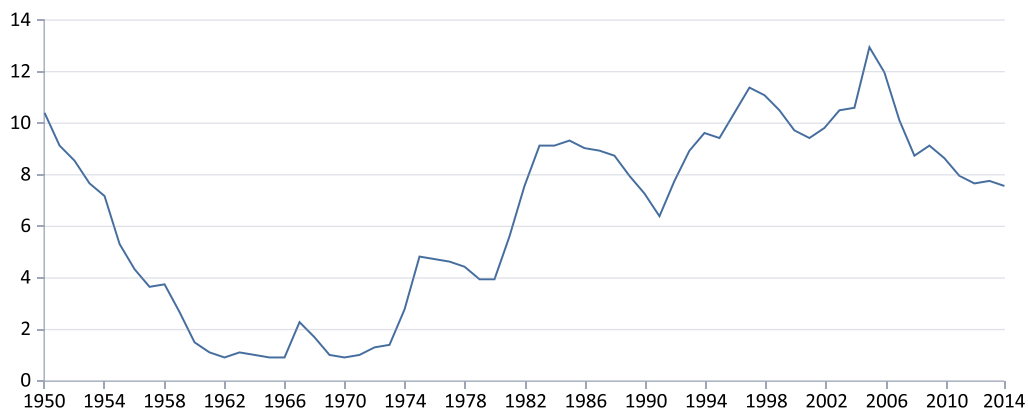
--- = Growth trend, 1950 – 1973 and 1973 – 2014



Source: Statistisches Bundesamt (2015g).

Chart 3: Official unemployment rate, FRG 1950 – 2014

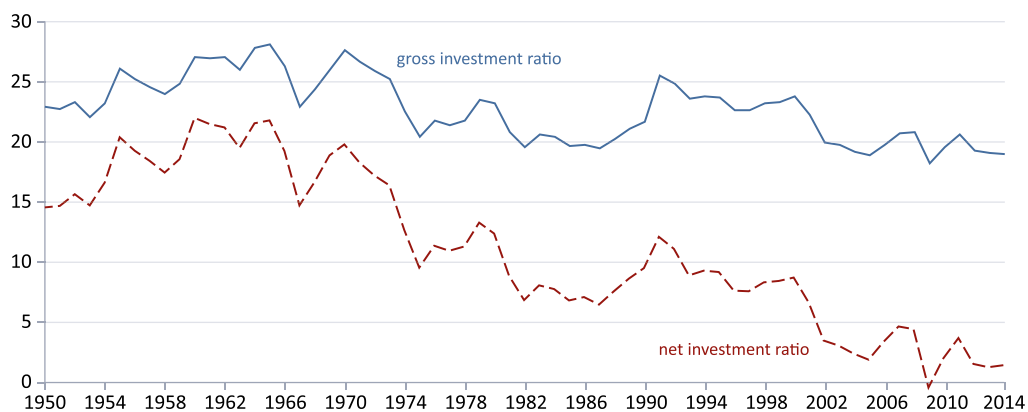
%



Sources: Sachverständigenrat (1994, 2004), Statistisches Bundesamt (2015a).

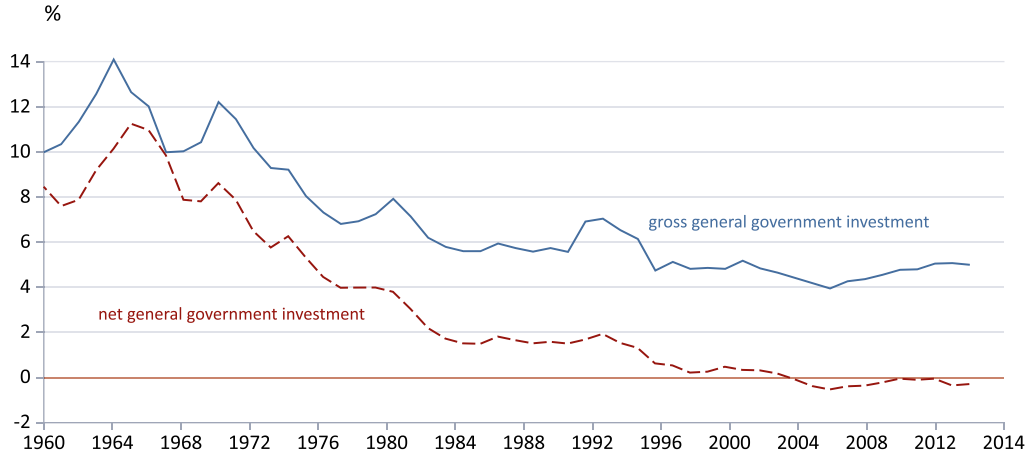
Chart 4: Gross and net investment ratio, FRG 1950 – 2014

%



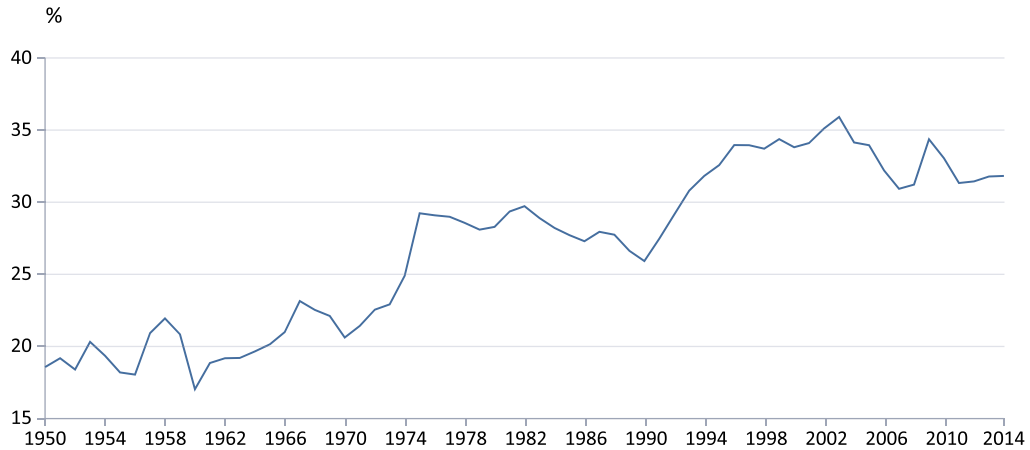
Sources: Sachverständigenrat (1969, 1979, 1994, 2004), Statistisches Bundesamt (1972, 2015d, 2015f, 2015g).

Chart 5: Ratio of gross and net government investment to overall public expenditure, FRG 1960 – 2013



Sources: Sachverständigenrat (1994, 2002, 2004, 2015), Statistisches Bundesamt (2014, 2015e).

Chart 6: Ratio of public welfare benefits to national income, FRG 1950 – 2014



Sources: Bundesministerium für Arbeit und Sozialordnung (1992), Sachverständigenrat (1969, 1979, 2004), Statistisches Bundesamt (1972, 2015d, 2015e).

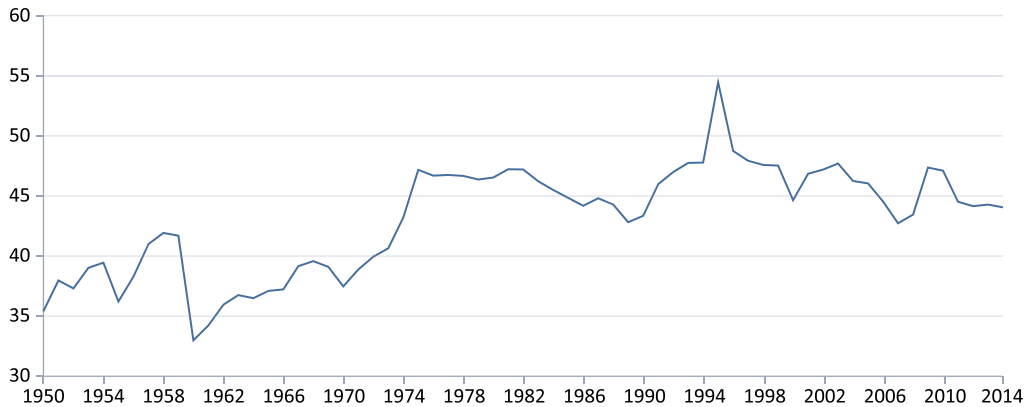
government debt-to-GDP ratio since the 1970s was triggered by cyclical or one-off historical events such as German reunification. It is noteworthy that the structural break in the trend of the Federal Republic of Germany's government debt-to-GDP ratio since 1975 (chart 1) was concurrent with structural breaks in the trends of a number of other economic metrics in the 1970s. In connection with the first oil price shock, the end of the *Bretton Woods system* of fixed exchange rates and the Deutsche Bundesbank's policy shift to strict monetarism, the bottom fell out of GDP growth in 1974 and has since levelled off around a lower growth

trend (chart 2). The pattern of unemployment illustrates the increase in hard-core unemployment from 1974 to 2005 (chart 3). Nevertheless, it is hard to prove a cause-and-effect relationship between economic development and government debt.

We can see that the development of government investments is hardly responsible for the expansion of government debt in Germany. In 1971 the Federal Republic of Germany's trend investment ratio began to fall (chart 4), as did public gross and net investment as a percentage of overall public expenditure (chart 5).

Chart 7: Public expenditure quota, FRG 1950 – 2014

Public expenditure in percent of nominal GDP



Sources: Sachverständigenrat (1994, 2004), Statistisches Bundesamt (1972, 2015e, 2015g).

At first glance it would seem that the spreading of the social welfare state increased government debt in Germany. From 1970 to 1975 government social benefit payments as a percentage of national income soared by 10 percentage points (chart 6). Over the same period, the public expenditure-to-GDP ratio also grew from below but close to 40 percent to below but close to 50 percent (chart 7).

These descriptive findings cannot be interpreted as causal relationships. What we can conclude from these findings is that, on the contrary, the rising government debt ratio in the Federal Republic of Germany since 1975, perceived as threatening, was at most a symptom and not a cause of other economic aberrations. Naturally, international causes also played a role, as the trend of rising government debt ratios since the 1970s as well as a levelling off of the growth trend since the middle of that decade can be observed in many industrialized nations.

3.3 The influence of financial crises

The last 140 years of modern economic history have seen three distinct phases in the development of government debt in industrialized countries: first, starting from the moderate late 19th century levels,

debt surged due to two world wars in the first half of the 20th century; second, debt was paid down rapidly during the period of strong growth between the Second World War and 1973; third, a subtle rise in government debt ratios beginning after the mid-1970s.

The long-term rise of government debt ratios since the mid-1970s is particularly noteworthy because the rise, unlike previous debt cycles, occurred in peacetime. This led policymakers to assume that unmanageable social expenditure together with declining growth rates were primarily responsible for the rise in government debt in the Western world. A possible explanation for the rise in debt beginning in the 1970s could be that, for a variety of reasons, governments in many countries were unwilling to accept the reality of slower growth: although tax revenues had fallen off, governments were still spendthrift, causing debt ratios to increase.

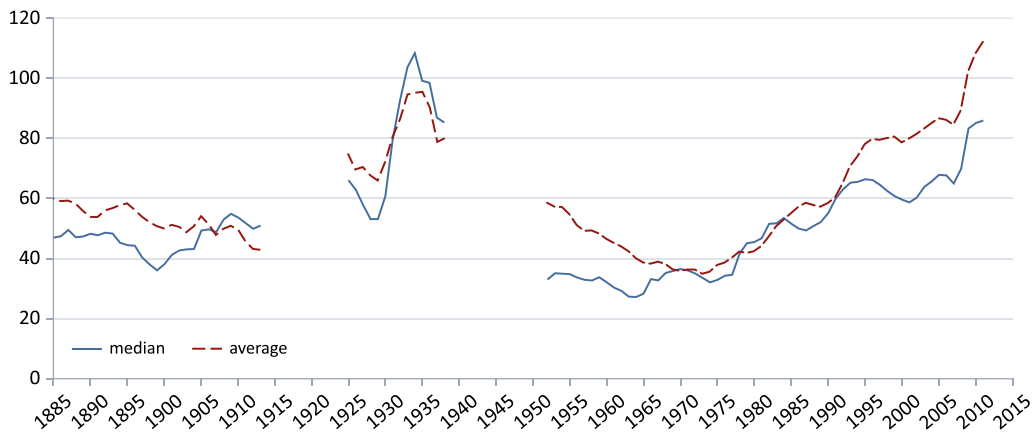
However, a closer look shows that, for a number of reasons, such generalizations are dubious. For one thing, government debt ratios in the Western industrialized world did not rise at the same rates. While average ratios rose, the pattern of debt growth varied considerably

across individual countries. In Australia and Switzerland they fell, or at least remained stable, from 1970 to 2010 (chart 11). The increase was also fairly moderate in the Swedish welfare state with twenty percentage points. However, in Germany the increase was significant, at around 60 percentage points. Finally, one-off effects play a key role in many countries, refuting explanations which posit the primacy of common factors.

One-off effects that relate to Germany include the burdens of reunification and the costs of the financial crisis after 2008. By contrast, government debt growth in the 1970s, however, were not a function of

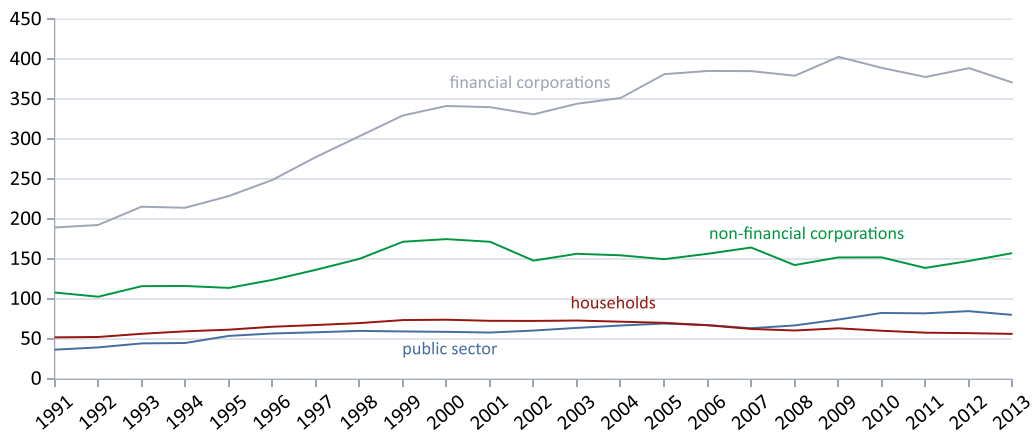
distress in the banking industry. In other industrialized countries it was often the fiscal costs of banking crises that led to a surge in government debt ratios. Since financial sector liberalization began in the 1970s, financial crises have been more frequent. In the first three postwar decades – under the so-called Bretton Woods system – there were no significant financial crises in the Western world.³⁵ Since 1980 there have been more than 20 such banking crises in developed OECD economies alone.³⁶ The fiscal costs of these financial crises have grown. The median rise in government debt ratios caused by banking crises has been around 30 percent of GDP since 1980. The growth of the financial sector is

Chart 8: Government debt in percent of GDP; 1885 – 1913, 1925 – 1938, 1952 – 2011
G7 countries



Source: Jordà et al. (2013a).

Chart 9: Debt-to-GDP ratio of various economic sectors, FRG 1991 – 2013
in percent of GDP



Sources: Deutsche Bundesbank (2009, 2013, 2014a), Statistisches Bundesamt (2015g).

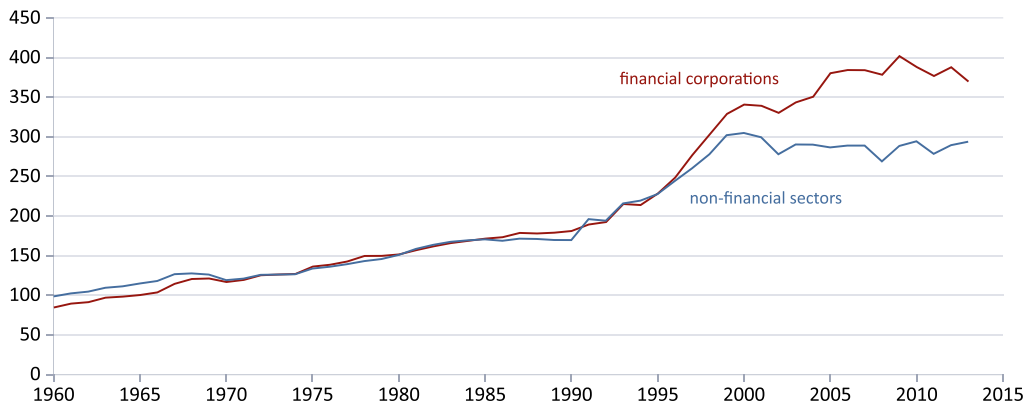
probably an important factor in the rising costs of financial crises.³⁷ According to a study by the IMF, bank bailouts account for only a fairly small share of the costs of financial crises, i.e. around 4 percent of GDP.³⁸ The majority of the rise of government debt is attributable to lost tax revenue following post-crisis slumps.³⁹

If we look at how government debt has grown in the last three decades, we see that structural deficits in the government sector were not the only factor engendering risks to the sustainability of public finances. In countries affected by systemic financial crises, the costs of such crises ex-

plain a substantial percentage of the rise in government debt. However, financial crises are generally a consequence of excessive borrowing and speculative bubbles in the private sector.⁴⁰ They only become a severe strain on public finances over time – an important distinction which does not get enough attention in the public debate. More recent empirical studies have failed to identify any close correlation between growth rates or government debt levels and the risk of financial crises.⁴¹

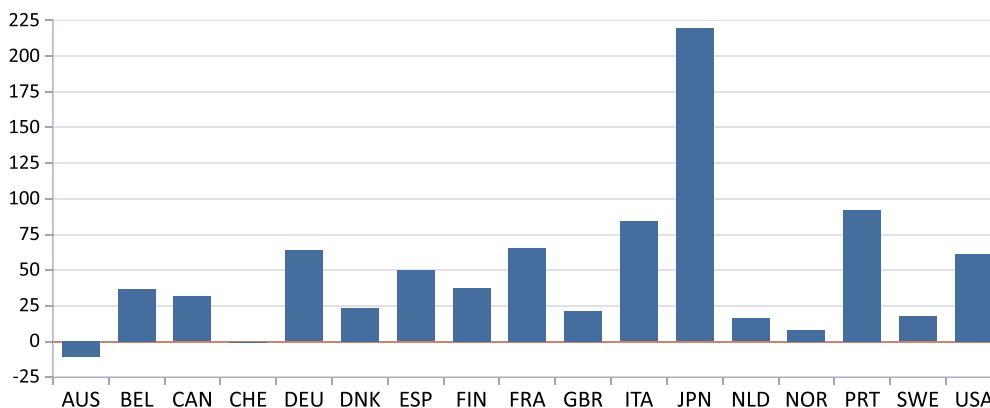
When explaining the level of government debt, it has to be taken into consideration that ultimately government

Chart 10: Debt-to-GDP ratio of the financial sector in comparison to all other sectors of the economy, FRG 1960 – 2013
in percent of GDP



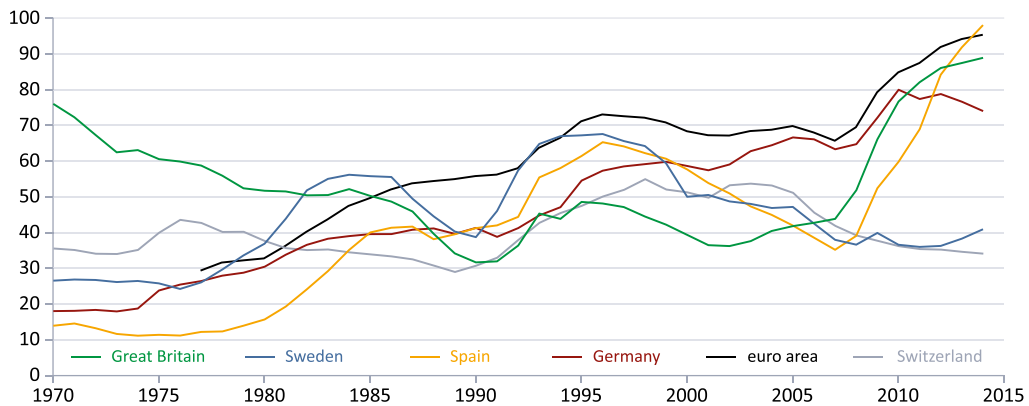
Sources: Deutsche Bundesbank (1994, 2009, 2013, 2014a), Statistisches Bundesamt (2015g).

Chart 11: Government debt-to-GDP growth in OECD countries, 1970 – 2011
in percentage points of GDP



Source: Jordà et al. (2013b).

Chart 12: Government debt-to-GDP ratios of selected countries, 1970 – 2014
in percent of nominal GDP



Sources: Europäische Kommission (2015), Eidgenössische Finanzverwaltung (2015).

borrowing processes vary from one country to another. Whereas in the United Kingdom and in Switzerland phases of consolidation alternate with periods of significant increases in the government debt-to-GDP ratio, in Germany government debt showed unbroken trend growth.

3.4 Government debt in democracies

Historically – and this is noteworthy – in some countries, such as the USA, Great Britain and France, significantly higher levels of debt relative to GDP have been observed. However, this time is different, as the current debt crisis and high level of indebtedness represent peacetime record highs. This raises the question as to whether Western democracies have lost their ability to deal with government debt. It is unclear whether it is exogenous or (political) endogenous factors that boost debt.

In modern democracies, government debt is primarily influenced by economic and socioeconomic factors such as economic growth, economic cycles, banking crises, wars or demographic developments. Although these factors are ultimately also shaped indirectly by the political framework, these parameters can, however, also be regarded as exogenous

to the political system. For some time, researchers have been trying to establish whether elements specific to constitutional democracies also directly influence the extent of government debt.

Research on the politico-economic causes starts with relatively new developments in *public choice* theory, according to which decisions by politicians are not just altruistically geared to the common good but are instead much more motivated by their own personal gain and the interests of their clientele. In a democracy, political gains (votes) can be expected if additional public services are provided, but these are offset by losses (of votes) whenever taxes are imposed in order to obtain the necessary funding of these services. Seen from this perspective, government borrowing looks like a way of reducing the political costs of the financing burdens by shifting taxes into the future.⁴² Rational expectations according to the Ricardo-Barro equivalence proposition would eliminate this effect along with the future burden.⁴³ The more the public is subject to fiscal illusion due to incomplete information, the stronger the effect of the shift will be. Several indicators support this assumption. The costs of obtaining the information needed for an exact assessment of future liabilities is considerable; it is difficult to convert the overall economic tax burden

into the expected actual burden for each individual. What is more, since older voters have a limited time horizon, it is in their interest to defer tax burdens to the distant future. Accordingly, though the politico-economic approach is plausible, the exact extent of these factors is, however, unclear and can hardly be precisely quantified. Various approaches have sought to isolate politico-economic determinants and to empirically prove their existence.

A first approach has claimed that elections in a political economic cycle lead to an increase in the level of debt: it holds that governments – regardless of their political outlook – will attempt to improve their position prior to elections by providing more services and borrowing more to pay for it.⁴⁴ This assertion has ultimately not been empirically proven; at best, a higher incidence of voting and instability correspond with higher deficits.⁴⁵

In democratic systems, moreover, it seems plausible to attribute varying levels of influence on the level of government debt to political parties. In this vein, it has been long asserted that governments dominated by left-wing parties have a greater appetite for borrowing than right-wing governments, as, in order to serve their voting base, they will try to reduce unemployment through higher government spending. What is more, so the thinking, left-wing governments will accordingly lean towards a policy of *deficit spending*.⁴⁶

Empirical investigations, though, tend to suggest that it is, in fact, conservative governments which lower taxes in order to accommodate their voters and therefore tend to run higher deficits, whereas left-wing parties prefer to raise taxes as a means of income redistribution, thus keeping government debt low.⁴⁷ Some scholars contend that conservative governments are particularly guilty of running up government debt as a policy

instrument in order to reduce the fiscal scope of subsequent (left-wing) governments.⁴⁸ US Republican administrations since Reagan have indeed used government debt strategically to force Congress to cut social spending, but not to obstruct the subsequent administration.⁴⁹

Overall, explanatory approaches which are based on differences in political and institutional structures for the evolution of government debt are more plausible and empirically provable. There are essentially two such approaches.

One sees government funds as fiscal common pool resources, also referred to as the *common pool* problem. This is based on the assumption that numerous different political actors have access to government finances, which each of them will spend according to his specific interests. However, these actors only have to bear or internalize part of the costs of this spending themselves, as they are borne by all actors through taxes, yet derive the concentrated benefits of government activity. Therefore, government expenditure will be inefficiently high and government debt will rise accordingly. This leads to the assertion that, the more fragmented society, the legislative branch and the executive branch are, the higher government debt will generally be, giving the electoral and party systems a major influence on government debt. Therefore, electoral systems with mainly (relative) majority voting or first-past-the-post voting systems will increase government debt less than highly proportional voting systems with a fragmented party system where there are multi-party government coalitions, whose electorates and clientele have to be served after the elections.⁵⁰

A special version of this approach is the theory of fiscal *wars of attrition*. The theory states that a government deficit can only be lowered through raising taxes or lowering expenditure, to which

political costs are attached. None of the political actors (coalition parties, stakeholders) wants to bear these costs; each speculates that the other stakeholders will give in first and foot the bill. Thus, the reduction in government debt is either prevented or at least delayed.⁵¹ Here the degree of fragmentation also plays an important role. While coalition governments do not necessarily have a greater appetite for debt than single-party governments,⁵² government debt is clearly more difficult to reduce in highly fragmented systems.⁵³

Another approach, which is based on the decision-making process in the budgetary cycle, argues with an even greater institutional focus.⁵⁴ If the finance minister has a strong position in setting the budget and in budget implementation, he can thwart the tendencies of the other cabinet ministries and their bureaucracies to maximize their share of spending.⁵⁵ A powerful executive branch in general and head of the executive in particular relative to the legislative branch will have a curbing effect on government debt.

The debt ratios of OECD countries certainly show that even these institutional structures have various effects and should be understood as explanatory factors supplementing the economic factors. The structures of the political and institutional framework of the Federal Republic of Germany, moreover, accordingly tend to be debt-averse, which, however, has not been effective in constraining government debt.

3.5 The influence of cultural differences and mentalities

It is difficult to determine whether the actual differences in government debt between countries are also based on divergent interwar experience or on the institutional framework. Germany had comparatively low levels of inflation in the 1970s, but it also had the first inde-

pendent central bank, which switched to a monetary targeting policy in 1974, i.e. much earlier than the United States or Great Britain. In the United States inflation was very high at times and the central bank, unlike the Deutsche Bundesbank and the ECB, also has the additional mandate of maximum employment. But under Paul Volcker it suddenly lowered inflation by drastically increasing interest rates, at the price of a severe recession and high unemployment.

In most cases the government debt-to-GDP ratio increased at the end of a period of inflation; in Germany, this happened sooner. Amid rising unemployment, social welfare spending increased while the revenues of the social security systems dropped. By the 1990s, all OECD countries had launched significant labor market and pension reforms, as demanded by the OECD and the IMF, which led to an initial wave of fiscal consolidation. In most countries the cuts in the social welfare state were accompanied by financial market deregulation; in some countries the losses in purchasing power due to fiscal consolidation were thereby offset at both the macroeconomic and the individual level. Nevertheless, the fiscal consolidation successes were partly undone by the aftershocks of the financial market crash in 2008.

It is questionable whether the “change in values” claimed by some social scientists and denied by others contributed to government debt. The 1980s and 1990s were a phase of rising social inequality due to growing income gaps and lower tax burdens on businesses and high earners as well as to welfare state reforms. Overall, the number of strikes has been reduced since the beginning of the 1980s; at the same time, tax rates on high incomes declined because of increasingly more open borders (“globalization”). The early 1980s already saw drastic tax cuts owing to growing resistance to taxes, particularly

in the United States. In some countries – though not in all – there was rapid growth in consumer lending, which partially offset the decline in real wages and social transfers. Germany was an exception. Whereas tax revenues were trending downwards, including in Scandinavian countries, high net-worth individuals were forming private assets as fiscal deficits grew and asset holders who had become richer were looking for safe investments. The expanding financial system, in constant search of new investment opportunities, was just as guilty of fostering the shift to a new “capitalism on tick”⁵⁶ as the alleged (“hedonistic”) shift in values and mentalities of broad sections of the general public which is sometimes claimed.

An international comparison cannot demonstrate that the welfare state is chiefly responsible for the rise of government debt. A country such as Sweden, which still has one of the world’s largest welfare states, is far less indebted today than the vast majority of OECD countries, including the United States and the Federal Republic of Germany. In the 1990s it was politically far easier to cut social welfare budgets globally than to defend the rates of tax paid by corporates and high earners. Low taxes, high military spending and the economic wreckage caused by the financial crisis, rather than its relatively anemic welfare state, are what are keeping the United States in debt.

4. Economic limits of government debt

4.1 Metrics for quantifying the sustainability of public finances

It is part of everyone's life experience that loans have to be repaid. But this insight from everyday life no longer applies collectively to households and their debt. Whereas some households pay off their loans, e.g. for buying a house, others take on new debt in order to build or buy a house. In an expanding economy the volume of such borrowing for house purchase by the younger generation is usually larger than the sum of loan repayments by the older generation. The overall volume of residential mortgage loans rose from 61 billion euro in 1968 to 264 billion euro in 1989 and to 935 billion euro in 2013.⁵⁷ Corporate debt has been growing along the same lines. For banks, whose business mainly consists of trading in loans on the asset and liability side of their balance sheet, increasing debt is a necessary prerequisite for the expansion of their business. Customer deposits are the bank's liabilities. In 2006, the debt of financial corporations reached a peak of two and a half times that of non-financial corporations in Germany and was almost six times as high as government debt.⁵⁸ (See chart 10 for the long-term trend).

Neither the absolute nor per-capita figures are enough to assess the sustainability of public finances, as this reference value does not give enough information on the ability to pay. In essence, it makes sense to act like a bank when assessing the creditworthiness of an applicant. The amount of the loan has to be assessed relative to the borrower's income, assets and pre-existing financial liabilities.

Because the national government has access to the income and assets of the national economy through taxation or other coercive measures, aggregate economic performance is a useful indicator for government debt. Accordingly, the Maastricht Criteria apply gross domestic product (GDP) as the denominator of the caps on the government debt-to-GDP ratio (60 percent) and the deficit ratio (three percent).

The *credit financing ratio* (relative to government spending) and the *borrowing ratio* (relative to GDP) are related to the deficit ratio; the difference is that the former are derived from fiscal statistics data while the deficit ratio is derived from the national accounts.

Apart from the deficit ratio the primary fiscal balance is an important indicator of the sustainability of public finances. It is calculated as the difference between revenues and expenditure in the current budget after deducting certain budgetary items. It excludes spending in the form of interest payments and contributions to the reserves as well as revenues from net borrowing, withdrawals from reserves as well as proceeds from sales of government assets (e.g. through privatization). The primary balance indicates whether or not a government is making progress with fiscal consolidation. It is similar to the ratio of net borrowing to the interest expenditure of central, regional or local authorities.

If there is a primary surplus (a positive primary balance), then revenue is sufficient to cover current spending (excluding interest payments). If the primary surplus exceeds interest payments (the

interest charges from previous borrowing), debt falls. If, however, the primary surplus is not sufficient to finance interest payments (or if there is a primary deficit), then debt rises. If GDP growth lags behind debt growth, this creates a higher debt burden for future generations.

Further ratios for assessing the evolution of government debt are the *interest-tax ratio* and the *interest-expenditure ratio*. They are determined according to fiscal statistics data and refer to interest payments on tax revenue or government expenditure, respectively. These ratios have been criticized as having limited informative value. They only provide information on the designated metric without indicating when the danger threshold for government debt is exceeded.⁵⁹

4.2 The relationship between the growth rate and the interest rate (Domar model)

The state can increase its fiscal scope in the short and medium run by borrowing at longer maturities. The response to the question to what extent government debt makes sense in the long run and can be raised without any risk essentially depends on whether the state can finance its spending in this manner without damaging its future creditworthiness and solvency. The implications of government debt for the state's ability to act were pretty much already illustrated by Domar (1944).

Assuming (in a long-term view) a constant real growth rate γ , a constant inflation rate π and a constant real interest rate ρ as well as a constant rate of net new debt (deficit ratio) k , then the debt ratio (total government debt D over the national product Y) converges to the following value irrespective of the starting value:

$$(1) \quad \frac{D}{Y} = \frac{k}{\gamma + \pi},$$

i.e. the debt ratio (government debt divided by the nominal national product) converges over time to the ratio of the deficit ratio and the growth rate of the nominal national product.⁶⁰ This equation becomes clear if we express it as $(\gamma + \pi)D = kY$. The left side is the annual debt increase if it grows as fast as the nominal national product. The right side is also the annual debt increase, expressed with the help of the deficit ratio. Accordingly, the higher the long-term deficit ratio is, the higher the long-term debt ratio will be, and it will be lower, the higher the growth of the nominal national product is. This results from the sum of the real growth rate and the inflation rate. Although the deficit and government debt could rise in the long-term under a sustainable policy, neither should rise faster than the nominal national product.

The long-term debt ratio, together with the difference between the real interest rate ρ (also assumed to be constant) and the real growth rate γ , determine the public sector's fiscal scope in the long run: these parameters determine the primary surplus – expressed as difference between the tax revenue T and (net) government spending (excluding interest payments) G – the state has to generate in the long run in order to remain solvent. Derived from equation (1), equation (2) shows the relationship between the primary surplus and the national product:

$$(2) \quad \frac{T - G}{Y} = (\rho - \gamma) \cdot \frac{D}{Y}$$

As long as the real interest rate exceeds the rate of economic growth, a permanent primary surplus has to be generated in the long run in order to finance the interest charges. The higher the long-term debt ratio and the greater the difference between real interest rate and the permanent growth rate, the higher the interest charges will be. In the long run, a primary fiscal deficit is possible only if the real national product grows faster than the real

interest rate. γ and ρ are real rates. The creation of money can also only slightly modify this condition:⁶¹ In addition to tax revenues, seigniorage⁶², i.e. the profits generated by a central bank through issuing central bank money, also ensues. However, they only constitute a very small share of the national product.

There are theoretical models which illustrate that the real growth rate can be higher than the real interest rate even in a long-term equilibrium.⁶³ This is also referred to as a state of “dynamic inefficiency”. In such a state, the economy is so highly capitalized that a near-term decrease would not negatively affect future prosperity. This is because sustainable consumption peaks when the interest rate is the same as the growth rate, also known as the “golden rule of accumulation”.⁶⁴ In such a case of dynamic inefficiency government debt could be increased without having negative effects on both the state’s future ability to act as well as on economic development. In fact, in the past we have seen longer phases in which real interest rates were higher than real growth rates as well as phases in which they were lower; several countries, particularly Germany, are experiencing the latter.⁶⁵ There is, however, controversy as to how long this phase will last. Furthermore, there are theoretical models that demonstrate that even with a negative real interest rate there can be long-term equilibrium.⁶⁶ Because the nominal interest rate normally cannot become negative, negative real interest rates are possible only if the rate of inflation is positive.

On the other hand, there are theoretical arguments stating that, in the long run, the real interest rate cannot be lower than the growth rate of the economy.⁶⁷ Their proponents particularly point out the existence of non-reproducible factors of production such as land, whose scarcity rent increases proportionally to the national product. These future scarcity rents

would have an “infinite” present capital value at a permanent interest rate that is lower than the growth rate, which means that there is no balanced investment market. Therefore the interest rate would perpetually exceed the growth rate. Under these conditions higher government debt reduces the government’s fiscal scope. Either taxes have to be increased in the long run, without the state providing more services, or the state has to cut back these services accordingly. If borrowing leads to an increase in interest rates, which becomes more likely with an increase in government debt, this can also “crowd out” private investment. All of these factors can constrain an economy’s growth and hence its international competitiveness as well as its job creation potential. The higher the debt ratio is, the more likely it is that the limits of debt sustainability are reached if shocks lead to an increase in debt.

The academic debate on whether and under what conditions the interest rate at which the national government can raise debt is above or below the growth rate of an economy has been by no means resolved. We will not be able to discuss it in any detail at this stage. Also, there is still controversy surrounding the issue of whether government borrowing should be based on the interest rate on government bonds regarded as risk-free, as there is a discrepancy between the interest rate paid by the German treasury and the interest paid by private borrowers – even those with excellent credit ratings. Some economists argue that the latter are a better criterion for decision making, as they indicate the desirability of additional private investment. Other economists note that the state should take the interest it has to pay as a reference point for its debt policy.

Empirically speaking, the interest rate that private borrowers with excellent credit ratings have to pay has mostly exceeded economic growth. Many economists see this as an indicator that govern-

ment debt should be reduced in order to allow for private investments at better financing conditions. However, other economists suggest that, firstly, the interest on debt payable by governments was in the past already frequently lower than the growth rate of the national product and that secondly, especially over time, the increased propensity to save is an indication that current and future interest rates are even lower than in the past. From this point of view a lot speaks against reducing government debt ratio.⁶⁸

The interest rates on risk-free investments are determined on the world capital market. An individual national treasury will only have little influence on them. However, government treasuries can collectively exert a major impact on global capital market rates. A global propensity towards large government debt will lead to high interest rates even on safe investments. A worldwide trend towards fiscal consolidation will reduce world capital market rates. As the propensity of an individual government to borrow should be higher, the lower the global capital market rates are, evidence suggests that an individual government will fare best by not joining the herd rushing towards high or low government debt.

Whether or not to increase or decrease the government debt-to-GDP ratio depends on whether the risk-free real interest rate remains above or below the national real growth rate in the long run. An interest-based government debt policy is therefore beneficial not only for Germany but potentially for other countries as well,

especially the Eurozone's member states. If the risk-free real interest rate is high, then a German policy of reducing government debt will concurrently help lower global interest rates, making it easier for other countries to lower their government debt. If, conversely, interest rates are very low, then a German policy of increasing government debt will cause Germany to become a sort of driver of other countries' economies. This makes it easier for such countries to adjust their public finances if this is necessary due to higher risk premiums on government debt.

4.3 Long-term debt ceilings and government fiscal latitude (Domar model)

The Domar model allows the calculation of a "natural cap" on government debt, which is distinct from other types of caps on government debt (e.g. legal, political, or psychological). A key outcome of the Domar model is that if the government net borrowing to GDP ratio is higher than the sum of the real growth rate and the rate of inflation, the debt ratio will not reach a fixed limit over the long term. The more the two parameters diverge (deficit ratio > economic growth rate plus rate of inflation), the faster the debt ratio will increase and the more likely it is that government debt will "explode". Assuming (in a long-term perspective) a constant real growth rate, a constant rate of inflation as well as a constant rate of net new debt (deficit ratio), then, in the long run, the government debt-to-GDP ratio will converge to the following limit irrespective of the starting value:

$$(3) \text{ Debt limit} = \frac{\text{nominal government debt}}{\text{nominal gross domestic product}} = \frac{\text{deficit ratio}}{\text{economic growth} + \text{rate of inflation}}$$

If we assume a (long-term) deficit ratio of 3 percent, 1 percent economic growth and 2 percent inflation, then, if these parameters remain consistent, the

debt ratio will increase to 100 percent of GDP in the long term. The new debt brake in the Basic Law only allows for a Federal deficit of 0.35 percent of GDP as of 2016

and as of 2020 no deficits whatsoever for the Federal states. With a long-term inflation rate of 2 percent and 1 percent economic growth, Germany's debt ratio would fall to 11.7 percent of GDP in the long run.

Following on from this, the higher the long-run deficit ratio is, the higher the long-run debt ratio will be, and the higher the growth of nominal gross domestic product (approximated as the sum of the real growth rate and the rate of inflation) is, the lower the long-run debt ratio will be. Public finances are therefore also sustainable if the deficit and government debt rise in the long run, yet neither rises by more than (nominal) GDP.⁶⁹

The Domar model can also be used to simulate the future pattern of the government debt ratio. In chart 13 four different scenarios with varying annualized assumptions will be calculated:

- Scenario 1 “Compliance with the debt rule”
- Scenario 2 “Maastricht scenario”
- Scenario 3 “Government projection”
- Scenario 4 “Worst case”

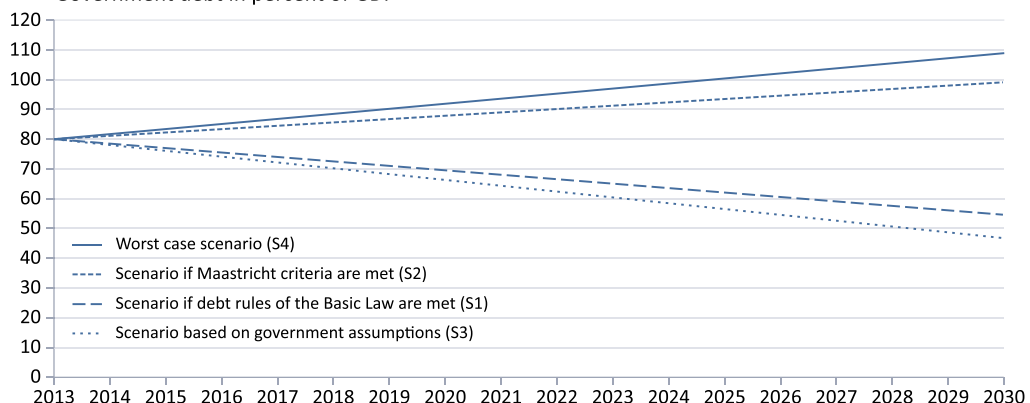
All scenarios are based on the same assumption that inflation remains constant at 2 percent, the ECB's target. In the first model it is assumed that the general government deficit ratio will remain con-

stant at 0.35 percent of GDP, the Federal limit as of 2016. Assuming a growth rate of one percent (= the average from 2000-2010), this would imply a slow and constant reduction in the debt ratio. If the Maastricht reference value of 3 percent of GDP is taken as the basis (see scenario 2 in chart 13), then the debt ratio will gradually rise. The third scenario is based on the government's assumptions for the coming years. The Federal Government bases this assumption on an economic growth rate of 1.6 percent for the coming years and general government borrowing of around 0.1 percent of GDP.⁷⁰ This “optimistic” version would significantly reduce the problem of indebtedness. The government debt ratio would decrease by around 10 percentage points in the present legislative period if the assumptions made remain unchanged. In the medium term, the problem would be significantly mitigated.

The fourth scenario can be understood as the “worst case” projection. It could occur if the euro crisis and the Eurozone debt crisis were to become worse. Under these circumstances, a general government deficit of four percent of GDP in Germany would not be an unrealistic assumption, as well as weak growth of only 0.5 percent of GDP. Consequently, debt ratios would further increase and reach the 100 percent mark by 2024.

Chart 13: Projections of Germany's government debt-to-GDP ratio based on the Domar model

Government debt in percent of GDP



Notes: own calculations based on equation 3.

Which of these scenarios is the most realistic depends both on global and Eurozone developments. Given the deflationary tendencies at present, rising inflation rates are probably no more likely than they were a few years ago, despite high “TARGET2 balances” and the financing of government debt in southern Europe.

Overall it can be said that, even slight tinkering with the assumptions of the Domar model will cause the outcomes to vary strongly even in the short and medium term. After four years there will already be a 25 percent difference between the worst and the best forecast, and after 12 years this difference will be 90 percent. The deficit, or more precisely, net borrowing, is the politically most tractable factor although this metric depends heavily on exogenous factors such

as demographic developments and technological progress.⁷¹ By contrast, economic growth and inflation (as well as interest rates) are endogenous factors that fluctuate on a cyclical basis. This model can be further enhanced if, in addition, different cyclical trends are assumed for the scenarios.⁷²

The long-term government debt ratio, together with the difference between the real interest rate (which is also assumed to be constant) and the real economic growth rate, determine the government’s long-run fiscal scope. These factors determine the amount of primary surplus the government has to generate in the long run in order to remain solvent. The ratio between the primary surplus and GDP can be derived from equation (3) as:

(4) Required long-term primary surplus =

$$\frac{\text{tax revenues} - \text{public sector expenditure (excluding interest)}}{\text{nominal GDP}} = (\text{real interest rate} - \text{growth rate}) \frac{\text{nominal government debt}}{\text{GDP}}$$

As long as the real interest rate exceeds the rate of real economic growth, a primary surplus has to be generated in order to finance the interest charges in the long term. The higher the long-term debt ratio and the larger the difference between real interest rate and real long-run growth rate are, the higher the interest burden is. With a real interest rate of 3 percent and economic growth of 1 percent as well as a government debt ratio of 80 percent of GDP, the primary surplus has to be 1.6 percent of GDP. If the real interest rate is lower, the budget situation will improve. With a real interest rate of 2 percent, the primary surplus generated is 0.8 percent of GDP. In 2013, the Federal Government ran a primary surplus of 8.9 billion euro, i.e. around 0.3 percent of GDP, while the Federal Government’s debt ratio was around 48 percent of GDP. In 2013,

real economic growth was around 0.4 percent. The average interest rate of government debt in the Federal budget was 2.9 percent and inflation was 1.5 percent. The required primary surplus (0.48 percent) was consequently around 0.2 percentage points higher than the actual primary surplus (0.3 percent). In the long term, a primary government surplus would only be possible if real GDP growth were higher than the real interest rate.

In summary it can be said that the long-term debt ceilings derived from the Domar model and debt sustainability, which can be approximated through the long-term primary balance, are both predicated on economic growth. High rates of long-term economic growth will drive down the long-term government debt ratio and widen fiscal scope. The

Domar model also shows that the public sector could inflate away some of its debt. Rising real interest rates and low economic growth will force the government to generate an ever-higher primary surplus.

4.4 When are governments overindebted?

From this vantage point, a government is fundamentally overindebted or insolvent when the present value of future primary surpluses is finite and lower than current public debt. In other words, the government is then unable to service its debt – in all conceivable scenarios the debt exceeds the government’s ability to repay it. In practice, this so-called intertemporal budgetary constraint is not a very helpful criterion. As long as a government is plausibly able to generate future surpluses, no caps on new borrowing can be derived from this. Following on from this, the question of sustainable government debt ratios is therefore central to the practical debate. The analysis of the sustainability of public finances is generally based on the assumption that the government debt ratio should not continually rise and/or surpass certain limits. How high these limits are and how they can best be defined are controversial issues.

A decisive factor when analyzing the sustainability of public finances is the interaction between interest rates, economic growth rates and primary surpluses. Public finances are generally considered to be sustainable when the government debt-to-GDP ratio can be stabilized, given realistic assumptions concerning interest rates, economic growth rates and primary deficits. This specifically means that the primary surplus has to match debt growth, which ensues when the interest rate minus the GDP growth rate is positive, i.e. the debt in the numerator grows faster than GDP in the denominator.

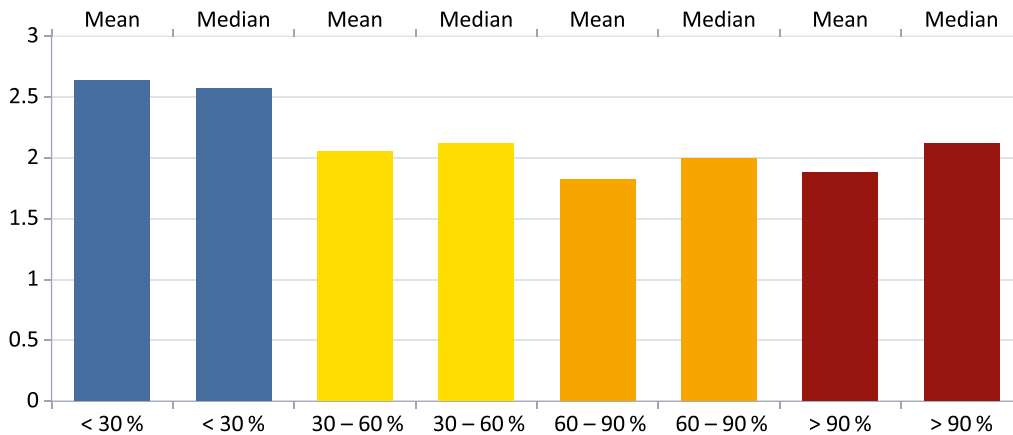
Although this method is an important tool for assessing the sustainability of debt, there are significant practical problems. Such analyses are very susceptible to slight changes in assumptions regarding the long-term pattern of interest and growth rates. Extrapolated over many years, small forecasting errors can skew the analyses upward or downward. What is more, analyses that essentially are based on non-observable factors such as future growth rates or interest rates are prone to politically motivated embellishment or pessimism. In addition, it is impossible to derive from this framework any definitive measure of what constitutes the “critical” government debt ratio level. It is also evident here how dependent the analysis is on fundamental assumptions regarding growth rates, interest rates and the political scope for fiscal consolidation. The government debt ratio could just as easily be stabilized at 50 percent, at 100 percent or at 150 percent of GDP and thus fulfil the criterion of sustainability.

From the perspective of economic history, and contrary to widespread opinion, no clear thresholds for “critical” levels of government debt can be defined. In a widely cited study, Carmen Reinhart and Kenneth Rogoff argue that the negative effects of government debt on economic growth begin to appear once government debt reaches around 90 percent of GDP.⁷³ Upon a more precise analysis, however, it becomes apparent that this correlation is based on individual observations for the years after the end of the Second World War – during which the US government debt ratio had risen to an all-time high of approximately 120 percent of GDP. At the same time, GDP fell sharply during the shift from a war economy to a peacetime economy in 1946 and 1947, which means that the data do actually show a negative correlation between the government debt ratio and the growth rate. However, without the observations for the years 1946 and 1947, the negative correlation vanishes.

Chart 14: Government debt and economic growth, 1880 – 2008

Arithmetic mean and median of 14 industrialized countries*

(x-axis = public debt-to-GDP ratios; y-axis = annual growth rates in percent)



* Australia, Canada, Denmark, France, Germany, UK, Italy, Japan, the Netherlands, Norway, Spain, Sweden, Switzerland, USA
Source: Schularick (2012).

Although the public debate suggests otherwise, the errors found by Herndon et al. (2013) in the calculations of Reinhart and Rogoff are not so important. Cecchetti et al. (2011) and Égert (2012, 2013) also find a negative relationship between government debt and economic growth in more systematic and less descriptive studies. However, the thresholds of the non-linear relationships between the two values these analyses focus on can substantially vary.

If we examine the historical relationship between government debt ratios and growth rates, we are unable to establish any obvious connection that would allow us to identify a distinct threshold. As illustrated in chart 14, on average, no slowing of growth could be observed in the 14 examined industrialized countries in the years in which government debt exceeded the threshold of 90 percent of GDP. The effects on interest rates and private investment activities regularly assumed in the theoretical literature cannot be readily determined from the data, either. Of course, this does not mean that rising government debt does not have any effects whatsoever on the costs of public borrowing. However, historical experience illustrates that such relationships are very context-specific and

depend on external factors which are not covered by the often simplistic lines of argument, such as Ricardian equivalence or *crowding out*. In summary it can be said that, from a historical point of view, nations' fiscal scope is highly heterogeneous and changes over time.

Moreover, no study has so far been able to convincingly solve the problem of causality. Government debt might weigh on economic growth and cause the much-discussed negative effect. However, if economic growth is low, government debt generally increases. In the first case of negative correlation between both factors, it is government debt which impacts on growth; in the second case, growth impacts on government debt. As Panizza and Presbitero (2013) present in detail in their global analysis, this causality problem has remained unsolved.

A large share of debt in foreign currency engenders particular risks for the sustainability of public finances. In such a situation, a devaluation of the currency leads to an increase in the real debt burden, which in turn has a negative effect on debt ratios. In addition, the risk of speculative attacks increases, as the central bank can no longer stabilize expectation formation

on the financial markets. Creditors' expectations are a decisive factor in the growth of debt. If the financial markets do not doubt a country's long-term growth prospects and budgetary policy, interest rates will remain low, and the probability that debt will remain sustainable also increases. In the opposite case, there is the danger of a negative self-fulfilling prophecy: if investors are sufficiently pessimistic, debt securities will already be sold on the market today, which will cause interest rate to go up. This in turn will make it more difficult for that country to consolidate its budget. If expectations are negative, the negative scenario is more likely to materialize.

If countries are indebted in their own currency, central banks can stabilize such situations and can ensure that the economy does not slide from the "good" expectation equilibrium with low interest burdens to the "bad" equilibrium with high interest expenditure. Credible announcements by the central bank that it will fight back against such speculative attacks and maintain interest rates of government securities at a low level can prevent a vicious circle of higher interest rates and fast-growing debt. The example of the Eurozone in the last couple of years illustrates that merely the announcement of such possible interventions on the part of the Central Bank can be enough to prevent a slide into the bad equilibrium. This is what happened in the summer of 2012 when ECB president Mario Draghi announced the OMT program, which calmed the financial markets and set in motion a train of positive dynamics, even though the program has not yet been activated.

4.5 Assumptions made when defining the Maastricht criteria versus reality

The Maastricht criteria for the government deficit and debt ratio limits in the European Monetary Union are intended

to contain negative externalities. If government debt rises disproportionately in one Eurozone member state, the negative external effects can spread from there to the other members, particularly if the interest rate increases for all.

The threshold of three percent for the deficit ratio and of 60 percent for the government debt-to-GDP ratio, as set out in the Maastricht Treaty and in the Stability and Growth Pact, go back to considerations based on the Domar model. The fathers of the Maastricht Treaty did not want to let the EU average debt ratio, which had been rising, especially since 1975, and in 1990 stood at around 60 percent of GDP, to rise under any circumstances, but rather to bring it back down. The question of whether and under which conditions a government debt-to-GDP ratio of 60 percent or even more was too high and dangerous, only played a minor role.⁷⁴

The setting of limits for the deficit and government debt-to-GDP ratio was based on the following assumptions: It was presumed that the long-term annual growth rate of GDP would be a real three and a nominal five percent. It was therefore expected that the annual inflation rate would match the target of the Bundesbank and later that of the ECB (2 percent). As described in equation (1), based on these assumptions, the government debt-to-GDP ratio will converge to 60 percent regardless of the initial level if the deficit ratio is three percent. The debt ratio will also fall to 60 percent in the long term in countries with a higher initial debt ratio if the deficit ratio remains at three percent and as long as nominal GDP growth is five percent.

In the first two years following the launch of monetary union on 1 January 1999, when the world economy was still booming, the euro area's GDP actually grew in real terms by the assumed three

percent and nominally came close to the assumed five percent.⁷⁵ The member states, apart from Greece, had no problem complying with the deficit criterion. But then the Eurozone member states encountered a phase of slower growth following the bust of the *New Economy Boom* in 2001. From 2001 to 2005 euro-area GDP growth averaged a mere 1.4 percent in real terms and 3.5 percent in nominal terms. The growth rate of the euro area's public revenues was lower than that of its GDP. Despite all austerity measures, public expenditures grew more than GDP.

The consequence of these developments was that the deficit ratio of the entire euro area, which had fallen from 5.2 to 1.0 percent from 1995 to 2000, rose to 2.7 percent in 2003 and 2004 before dropping slightly to 2.5 percent in 2005. Apart from Greece, it was especially the two largest member states, i.e. Germany and France, which overshot the deficit limit of three percent. Their government debt ratios, which had fallen in the previous years, went back up after 2002.

4.6 Public investment and sustainability of government debt

Public investments are important for the sustainability of government debt, as they can increase private sector productivity and can therefore contribute positively to economic growth. If the additional growth contribution is higher than the effect of additional credit-based investments on the level of interest, this additional debt will not affect the sustainability of government debt. In such cases the growth-enhancing effects of public investments are more important.

Studies on this issue come up with different findings. At least they went some way to deflating the notion that prevailed in the 1950s and 1960s that public investments were as productive as private sector

investment.⁷⁶ Moreover, the public investment to GDP ratio (investment ratio) fell across the OECD from 1971 to 1990. The explanation given for this, however, was that if fiscal scope is limited, it is easier to cut back on investments and consolidate, with less political resistance, rather than to cut back current public expenditure on personnel and the social welfare sector, which labor law and other statutory provisions render from very difficult to impossible.⁷⁷ According to calculations based on figures published by the Bundesbank, which are, however, very controversial,⁷⁸ there has been a significant decrease of public net wealth. This is a dangerous trend for the sustainability of public finances.

Academic research on the productivity of public sector expenditure in general and public investment in particular was intensified beginning around 1990.⁷⁹ The need for research was based on two factors: the decrease in the public investment ratio and the infrastructural shortcomings and bottlenecks that have become apparent, and the assumption that this decrease slowed the growth of productivity in the 1970s and 1980s. In the course of this research, numerous empirical findings were generated applying different methodical approaches. When Sturm, Kuper and de Haan (1996) summarized contemporaneous and older research, their results ran the entire gamut: the marginal productivity of public investments ranged from much higher, about the same, significantly lower and in some cases even negative compared to the marginal productivity of private investment.⁸⁰ Romp and de Haan (2007) updated this overview of the empirical literature. They noted that the methods for estimation had improved. The empirical findings still differed regarding the effects of public investment on the growth of productivity and the economy. However, the empirical analyses tended to indicate that public investment had a growth-stimulating

effect.⁸¹ The extent of the effects of public investment depended on the quantity and quality of the existing infrastructure capital stock. In this context, the closing of infrastructure bottlenecks was of utmost importance.

Moreover, there is a complementary relationship between private and public investments. For example, if land needs to be opened up for building real estate, public and private infrastructural development on the site are crucial to making the real estate sellable. This includes municipal streets, water pipes and sewage, gas and electricity, cables for telephone and internet connectivity and much more. In Germany, public investment – as part of the large overall public expenditure – have been reduced the most. This also includes the above-mentioned negative net investment (see chart 5) over the past ten years. For Germany as a business location this consequently means that public investments have fallen more than the fairly low private investments.

Now public-sector data are available on the magnitude of the investment backlog in Germany. In May 2013, the Kreditanstalt für Wiederaufbau (KfW) surveyed 526 cities, municipalities and counties. The survey estimated the backlog for the municipal sector, in which 60 percent of public building investments are carried out, at 128 billion euro. The big-

gest gaps were in funding to repair transportation infrastructure and schools. Both the “Deutsche Landkreistag” (German County Association) as well as the “Deutscher Städte- und Gemeindebund” (German Association of Towns and Municipalities) therefore called on the federal states to provide better funding for the regional authorities. Although the municipalities generated a collective budget surplus of 1.8 billion euro, this was mainly due to canceling or deferring their investment projects.⁸²

But it has to be taken into consideration that the communal umbrella organizations are also pursuing an agenda of their own because they expect higher revenues from an investment surge. It can generally be said that certain public investments for infrastructure maintenance are necessary. In addition, there are new infrastructure needs, such as the expansion of power grids. But this does not mean that every public facility in need of renovation, be it schools, hospitals, community centers, administrative buildings, gymnasiums, swimming pools or any other public building, leads to a need for investment. In light of demographic change, careful consideration should be given instead to areas and regions where it makes sense to reduce infrastructure and where it should be rebuilt or expanded. Put differently, it is important to invest public funds where returns are sufficiently high.

Box 2: Is double-entry accounting better suited to setting the limits of government debt than cameralistic (single-entry) accounting?

Financial management in the government sector has traditionally been based on cameralistic (single-entry) accounting since the 16th century, i.e. the public administration's accounting is based on a statement of receipts and outlays. Only transactions that affect cash flow are recorded. Double-entry accounting had already been developed and practiced by Italian merchants in the Middle Ages out of their own commercial motives. This system made it possible to establish profits at any time by drawing up a balance sheet with the "assets" on one side of the ledger and "debt" on the other, as well as a profit and loss statement with flow variables on the expenses and revenues side. In order to tax profits, the government requires commercial businesses, apart from small sole traders, to undertake double entry accounting according to the "generally accepted accounting principles".

In Germany, double-entry accounting has increasingly been practiced at the government level for only the last two decades. For a long time it was not seen as necessary because, unlike businesses, the government did not regard its purpose as making profits or increasing its wealth. The government was there to cover public requirements and to fulfil public tasks set in the budget of the legislative branch of government. Cameralistic (single-entry) accounting allowed a comparison of the actual revenues and expenditures in the budget during a fiscal period, thus ensuring exact control over the implementation of the budget. Questions regarding the efficiency of implementation and trends of the balance of government assets and debt are hidden by "simple cameralistic (single-entry)" accounting.⁸³

In Germany, four states –Bremen, Hamburg, Hesse and North Rhine-Westphalia (NRW) – and almost all municipalities have already implemented or adopted double-entry accounting. In Bavaria, Schleswig-Holstein and Thuringia it has only been introduced as an option in addition to single-entry accounting.⁸⁴ The other federal states have decided to report their finances using "extended cameralistic (single-entry) accounting", i.e. introducing certain additional calculations such as management accounting, the product budget⁸⁵ for managing the output, balancing of accounts or wealth accounting and the like.

The Federal Government decided not to introduce double-entry accounting and with its reform project "Modernisation of the budget and accounting system" in 2010, it opted for a model of "extended cameralistic (single-entry) accounting" that lags far behind that of the federal states and has therefore been referred to as "rudimentary". Its key elements are wealth accounting as well as management accounting. The latter does not apply universally.⁸⁶ And on the former method the Sachverständigenrat (German Council of Economic Experts), in its expert opinion on the limitation of government debt in 2007, commented as follows: "It is true that the annual financial statement the Federal Ministry of Finance has to submit annually includes a statement of assets and liabilities apart from the revenue and expenditure account. ... [This does], however, have no informational value whatsoever, as assets and liabilities of the Federal Government are only incompletely accounted for and in some cases not at all."⁸⁷

Different parallel developments have led to double-entry accounting being used more frequently in public accounting in Germany since 1996⁸⁸:

- Following the reunification boom, average economic growth from 1993 to the present has been very meagre compared to the 20 previous years. This has been a burden for the public coffers, particularly those of the municipalities with their limited powers to raise taxes. This explains why the municipalities began to shift to double-entry accounting.⁸⁹

- The financial burdens of the reunification process – together with the decline in economic growth after 1992 – caused the government debt-to-GDP ratio to rise strongly up until 1996.
- More than the explosion of the explicit government debt, the rise of the much higher implicit debt fueled public debate on sustainability and intergenerational justice of public finances on the political stage and in public discourse.⁹⁰
- Methodologies have been developed for empirical research on effects; they are also applied to public finances but require data which single-entry accounting is unable to provide.⁹¹

Single-entry accounting is focused on present cash effects and does not cover information on past or future public revenues or expenditures, but only provides a one-dimensional picture of payment flows in the current fiscal year. Even if it shows present budget surpluses, this information is not suitable to answer questions on the sustainability and intergenerational justice of public finances.

Apart from the more or less expanded single-entry accounting system, the introduction of double-entry accounting at the level of all regional authorities, i.e. also at the federal level, would be a milestone in government accounting in view of securing the sustainability of public finances.⁹² It is a well-established instrument for safeguarding businesses' future, in that it is a device for the early detection of threats to the sustainability of corporate policy or even a business' viability, e.g. future charges in the reserves for company pension schemes. Double-entry accounting could be of similar significance for the sustainability of government debt, as it would also cover implicit government debt.

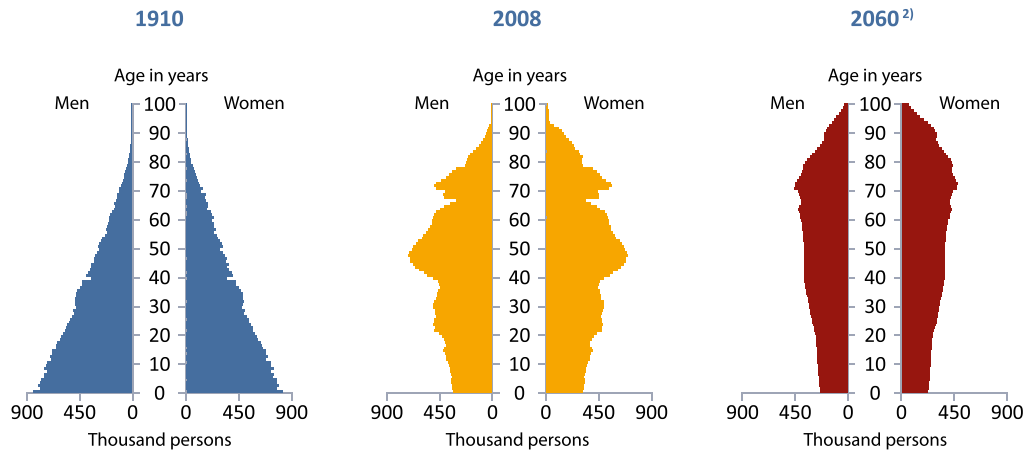
4.7 Demographics

A study of the state of public finances would be incomplete without considering the demographic transition taking place in Germany. The generation of baby boomers of the 1950s and 1960s was followed by cohorts with low birth rates. This meant that once the baby boomer generation reaches retirement age, the active labor force will have to work harder to fund the bulging pensioner generation.

Chart 15⁹³ shows the age structure of Germany's population. While in 1910 there were still enough young people and the age structure was pyramid-shaped, in 2008 there was a relatively large baby boomer generation slowly approaching retirement age and younger cohorts with significantly lower birth rates. In 2060 this effect will have all but disappeared from the data. From the demographic transition it follows that the ratio of persons age 65 and up per 100 persons ages 20 to 64 will continually increase in the coming decades (chart 16).

The data and calculations shown here are based on the “median population” variant of the 12th population projection of the Statistisches Bundesamt (Federal Statistical Office), which were updated with the help of the latest census and are adapted to the latest modified net migration figures. It assumes a near constant total fertility rate of 1.4 children per woman, an increase of life expectancy among newborns by 2060 to around 89 years for girls and around 85 years for boys, as well as a decline of annual net immigration from around 450,000 persons a year in 2014 to 100,000 persons in the long run (version 1-W1). Given annual emigration figures, such net immigration would require gross immigration of around 800,000 to 1 million people.

This demographic development means that on balance, government spending will increase in the future, as the larger cohorts of retirees will entail higher expenses for social insurance and pensions. Following from these considera-

Chart 15: Age structure of the population¹⁾

1) Reference dates are 31 December of each year. – 2) According to 12. koordinierte Bevölkerungsvorausberechnung des Statistischen Bundesamtes (Variante 1-W1), revised with data from the latest census.

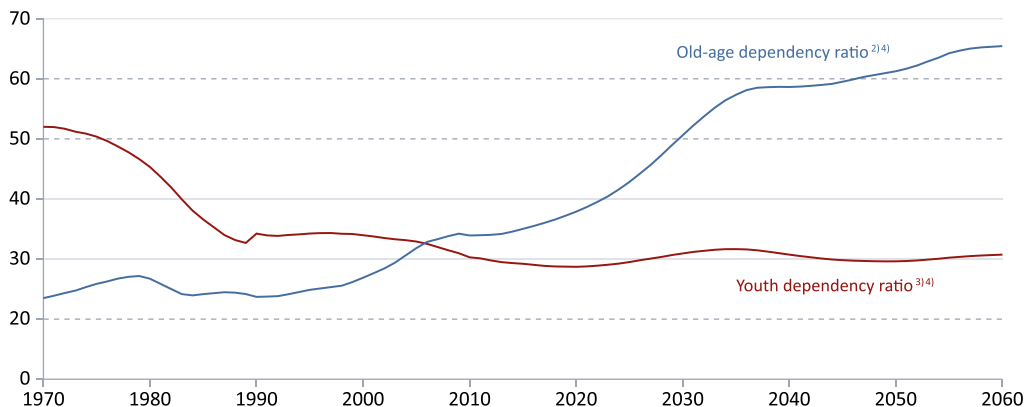
Source: calculations by the Sachverständigenrat zur Begutachtung der gesamtwirtschaftlichen Entwicklung.

tions, the concept of the sustainability gap was developed; it enables us to determine to what extent the primary balance has to be increased directly and permanently in order to keep public finances sustainable. When identifying a sustainability gap, a fiscal consolidation is imperative so that the national government debt-to-GDP ratio will not permanently increase.

These sustainability analyses imply that the average interest rate for long-term government securities is permanently

higher than the GDP growth rate and that the government therefore cannot expect faster economic growth to relieve it of its consolidation requirements. If the interest rate were permanently lower than GDP, no such sustainability gap could exist.

In its demographic expert opinion the German Council of Economic Experts (Sachverständigenrat 2011) reports a sustainability gap of 3.1 percent until 2060. Chart 17 reflects this development with updated calculations. The upper curve

Chart 16: Dependency ratios over time¹⁾

1) Until 1989: former territory of the Federal Republic of Germany. – 2) Number of 65-year olds and older per 100 persons ages 20 to 64. – 3) Number of under 20-year olds per 100 persons ages 20 to 64. – 4) According to 12. koordinierte Bevölkerungsvorausberechnung des Statistischen Bundesamtes (Variante 1-W1), revised with data from the latest census.

Source: calculations by the Sachverständigenrat zur Begutachtung der gesamtwirtschaftlichen Entwicklung.

indicates the growth of the government debt-to-GDP ratio without adjusting the contribution rates for social security insurance. Without consolidation, government debt-to-GDP ratio would rise only slightly up until 2030. This suggests that the social security insurances have become more resilient to demographic changes following the reforms of the past. As of 2030 government debt-to-GDP ratio would go back up to 247 percent, if no countermeasures were taken. The service expansion of the statutory pension scheme (so-called pension package), which was decided by the Grand Coalition in 2014 and has already been implemented will significantly increase the sustainability gap, to 3.4 percent.

4.8 Preliminary findings

We can now list the conditions which keep the government debt ratio at a certain level and thus make it sustainable. As the ratio is a fraction with government debt in the numerator and nominal GDP in the denominator, we can initially say that the ratio remains constant if the denominator and numerator increase by the same rate. While from 1950 to 1973 the government debt ratio in the Federal Republic of Germany remained fairly constant at around

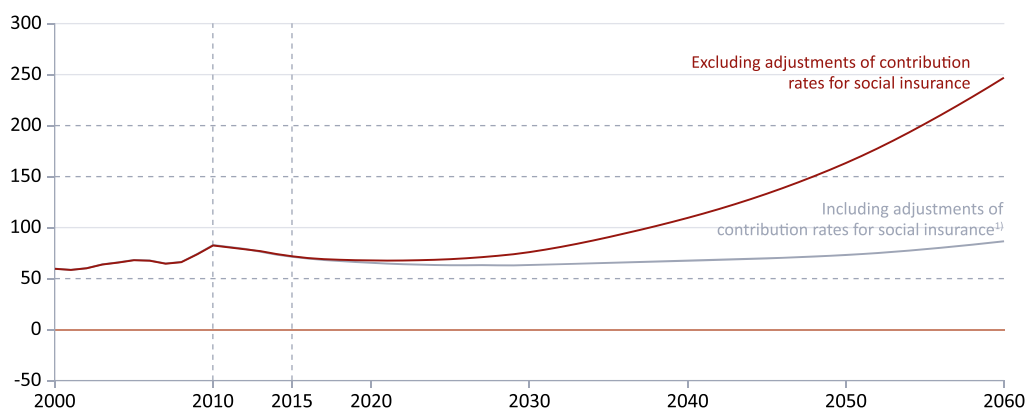
20 percent, the average annual growth of government debt of over 10 percent was much higher than in the following decades. However, the average rate of growth of nominal GDP was just as high.

In the years of the upward trend of the government debt ratio from around 20 percent in 1974 to over 80 percent in 2012, the denominator and numerator were no longer increasing in sync. In other words, average nominal GDP growth could no longer even keep up with the dampened increase in government debt. Trend real economic growth collapsed not only in the Federal Republic of Germany but in all major industrialized nations (Chart 2).

With economic growth, the interest rate and the primary balance of the public budget, the conditions for consistency and sustainability of the government debt-to-GDP ratio can be described as follows:⁹⁴

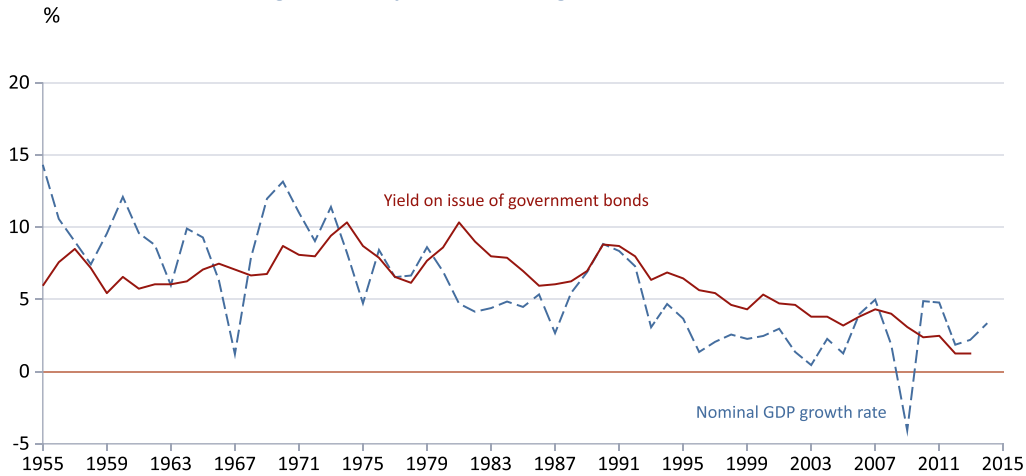
If the real interest rate is equal to the real growth rate of the economy, only the primary budget and not the overall public budget must be balanced. The surplus tax revenue generated through economic growth will then be enough to cover all interest payments from new borrowing, i.e. further overall public budget deficits.

Chart 17: Projection of government debt-to-GDP ratio until 2060
(in percent)



1) Including forward projection of the Federal subsidies according to the prevailing rules.
Source: Werding (2014).

Chart 18: Nominal GDP growth and yield on issue of government bonds, FRG 1955 – 2014



Sources: Deutsche Bundesbank (2000, 2014b), Statistisches Bundesamt (2015c, 2015g).

If the real interest rate exceeds the real rate of economic growth, the primary budget must generate a surplus so that government debt-to-GDP ratio remains consistent.

If the real interest rate is lower than the real growth rate of the economy, then the government debt-to-GDP ratio can even be constant if the primary budget is running a deficit. Like a *Ponzi scheme*, the state can service its debt through more and more borrowing.

These insights are based on the recognition of intertemporal budget constraints: tax revenues have to keep pace with public expenditure in the long run, at least as long as the relevant interest rate on government debt is not persistently below the growth rate of the economy.

The above observation of the conditions for a consistent government debt-to-GDP ratio is based on the assumption of real, i.e. price-adjusted, values. In nominal terms there is additional scope for government debt without endangering the stability of the government debt-to-GDP ratio. If there is real economic growth of zero percent, overall government debt can rise by the rate of inflation of, for instance,

2 percent without increasing the government debt-to-GDP ratio.

The limits of government debt in Germany will depend in the future on the evolution of the relationship between the real rate of economic growth and the real interest rate. If one assumes that the level of interest is permanently low due to the global capital glut and the world economy is meaningfully recovering from the financial and economic crisis – in particular from the ensuing government debt crisis – and is returning to the rate of economic growth prior to the crisis, one will be in favor of increasing government debt and not approve of limiting government debt. Part of the working group shares this view.

Assuming that the interest rate will exceed the growth rate sooner or later, the government's refinancing costs will consequently increase. If economic growth in Germany, owing to the demographic transition and absent an independent increase in the labor force through other measures, is far lower than the long-term interest rate, fiscal consolidation is advisable and government debt limits are welcome. This view is favored by another faction within the working group. The size of growth effects of public sector activity matters here. Investment in classical infrastructure, but

also in a society's human capital, can lead to higher growth rates. Any such positive growth effects in Germany since the 1970s have nonetheless not caused economic growth to outpace the interest rate. This could change in the future, but does not necessarily have to be so.

A third camp within the working group assumes that the interest level will not remain below the GDP growth rate over the long term. However, they hold that, whenever interest rates are lower than the growth rate, the public sector should take on very long run debt in order to finance its investment activities.

5. Burden shifting as a set of distribution problems

5.1 Possible intergenerational burden shifting

When, for instance, politicians talk about encumbering future generations with government debt, generally an analogy between private and public budgets is assumed. Individuals can borrow funds in the present to increase their spending. They thus transfer the burden of repayment to the future. Borrowing is seen as particularly justifiable when the benefits are accrued at a later stage so that benefits and costs offset one another over time, e.g. when borrowing in order to buy a home for one's own use. This is referred to as the *pay as you use* principle.⁹⁵

The analogy holds for external public debt, i.e. if a country borrows from non-residents. In this case it does not matter if the borrowing is denominated in domestic or foreign currency. This allows a country to consume and/or produce more today; but it will then later have to make payments to non-residents out of tax revenues. This is applicable as soon as interest has to be paid, but in particular, when the loan has to be repaid. In this instance, borrowing can also be justified with the *pay as you use* principle, especially if the foreign loan is used to increase domestic investment and thus productivity and tax revenues.

However, this analogy falls apart as soon as the debt is domestic, i.e. as soon as the creditors live in the same country. Already in 1817 David Ricardo – assuming full employment (Say's law) – pointed out that over a given period consumption can never exceed output. Consequently, public

expenditure reduces individuals' productive resources by an equal amount, whether these are financed through taxes or debt. The same applies to the repayment. Thus it is always a distribution problem between contemporaries.⁹⁶ Classical economics is based on this – as advocated by, for instance, Abba Lerner (1948) – asserting the virtual impossibility of shifting burdens to future generations.⁹⁷ This applies both to implicit and explicit debt. However, classical economics suggests that through public borrowing the distribution within later generations is skewed toward bondholders and at the expense of taxpayers. But of course these groups also overlap. Therefore what changes is not intergenerational distribution, but intragenerational distribution. This also applies to both implicit and explicit debt.

Even if he did not believe that this applied to reality, Ricardo showed that – when certain conditions are met, especially complete foresight – the financing by way of tax and debt are allocatively equivalent. This idea of "Ricardian equivalence" was revisited in particular by Robert Barro (1974), who viewed it more positively. For it to apply, a whole set of conditions have to be met; for instance, the taxpayers must have rational expectations and have to behave altruistically toward their descendants.⁹⁸

They know that they themselves or their descendants will later have to pay higher taxes to cover for today's tax breaks. They will therefore make provisions for this in the form of savings. Financing public services through taxes or debt is especially likely to have real con-

sequences when the economic actors have “debt illusions”; i.e. if they ignore the fact that they or their descendants will have to repay public debt at a later stage. Contrary to Barro, Ricardo assumed that a “debt illusion” existed and was thus actually not a proponent of the equivalence proposition which bears his name.⁹⁹

To what extent a debt illusion exists is an empirical question. The empirical literature does not wholeheartedly endorse the Ricardian equivalence as presented by Barro.¹⁰⁰ On the other hand, it can hardly be contested that later generations are burdened when debt is raised internally if the room for manoeuvre of these generations is thereby restricted overall. There are essentially three factors that can cause this:

- (i) The borrowing can influence the division of today’s production between consumption and investment. If public consumption crowds out private investments, which is primarily the case when there is full employment, this diminishes later generations’ potential output and – *ceteris paribus* – reduces their consumption opportunities.¹⁰¹ This argument is admittedly ambivalent. If the government makes additional investments with these funds and only slightly crowds out private investments or does not crowd them out at all, this will increase the potential output of later generations and consequently also their opportunities for consumption. Whether these generations experience a burden or relief from borrowing depends on the use of the additional public expenditure, on the productivity of the public investments (possibly) financed with these as well as on the crowding out of private investments through additional public spending.¹⁰²
- (ii) Buchanan (1958) pointed out that the classical orthodoxy is based on a somewhat questionable aggregation

of the respective generations in that it is assumed that a generation owes itself the respective government debt. If we look separately at securities buyers or holders and taxpayers, there is a substantial difference between the generations. If securities are issued, at the very least some improve their position, but nobody is worse off. The securities are voluntarily purchased and the taxpayers’ burden is lessened. However, the taxpayers of later generations are burdened, as their scope for decision-making is restricted. This also affects people who were not even born at the time of the borrowing or who were not yet eligible to vote, which means that their interests have been inadequately (or not at all) taken into consideration.¹⁰³ From this perspective, the burden is shifted to future generations, full employment or not.¹⁰⁴ In this respect there is also no difference between internal and external debt.

- (iii) The third mechanism through which burden shifting can occur becomes apparent when considering the generational overlap. In the arguments above it is implicitly assumed that the members of society living in one period are all of the same age. However, in reality people of different ages and interests can live contemporaneously – known as generation overlap. The reduction of the tax burden today also benefits those who due to their age will not be responsible for repayment, especially if maturities are long. But at the same time, the unborn are burdened as well. If a more long-term perspective is adopted and a stable population structure assumed, then in the case of borrowing, the first generation will be relieved, while the latter will be burdened.¹⁰⁵ This applies both to implicit as well as explicit debt and is also relevant where Ricardian equivalence

applies. As the population ages, this effect increases. It can gain political importance where aging increases the segment of the population with a stronger interest in raising debt.¹⁰⁶

Although the analogy from internal public debt to private debt does not hold, one cannot – as classical orthodoxy does – assume that there will be no burden for future generations through borrowing. This applies as long as the interest rate is higher than the growth rate.¹⁰⁷ What the extent of this burden will be is not a theoretical but an empirical question. There are now two approaches with which to address these questions: *generational accounting, developed* by Auerbach, Gokhale and Kotlikoff (1994), and a similar method developed by the OECD.¹⁰⁸

That taxpayers of later generations are burdened by borrowing does not necessarily mean that they will be worse off than if there were no borrowing. If the debt is used to finance additional public investments and if these investments are more productive than the potentially crowded-out private investments, the generation to come will be better off overall. Then it is possible that coming taxpayers – in absolute terms – will be better off thanks to the borrowing. This does not mean, however, that there would not be any political problems; for the political debate the relative aspect is generally much more important than the absolute one. If, for instance, the marginal tax rate on labor income rises due to borrowing, this can also lead to social problems even if the real disposable income of the employees concerned increases.¹⁰⁹

interpersonal income distribution are far less clear. This is due not only but also to the fact that both groups overlap. This applies not only when individual taxpayers hold securities, but especially when life and pension insurers hold securities for funded retirement provision.

The effects on functional income distribution are fairly straightforward. Borrowing tends to lead to redistribution in favor of capital owners, at least when the factors of production are being used to capacity. As capital ownership is positively correlated with income, it can be assumed that income distribution becomes more unequal with additional borrowing. This also largely depends, though, on how interest payments are funded: through (progressive) income tax or, for instance, a (regressive) value added tax.¹¹⁰ Inasmuch as additional debt leads to an increase in inflation, this is at the expense of the recipients of nominally fixed incomes. Where the lowest incomes – the lowest pensions as well as social welfare payments – are inflation-indexed, their recipients will not be affected. As there is no empirical analysis of the interest and amortization rates on this borrowing as well as the additional public spending enabled by the borrowing, the effects of government debt on personal income distribution remain highly uncertain.¹¹¹

5.2 Government debt and interpersonal income distribution

While the effects of government debt on taxpayers and securities holders as groups are straightforward, the effects on

6. Effects of government borrowing

6.1 Government debt, monetary policy and inflation

High government debt ratios often raise concerns among the public about strong rises in inflation or even hyperinflation, based on the fear that large debt will strongly incentivize the government to inflate away its debt. The traumatic experience of hyperinflation in Germany would appear to lend credence to these fears.¹¹² In reality, though, the link between government debt and inflation is much more subtle. There are many different ways to reduce a debt overhang. Examples from economic history (for instance, in Great Britain) show that even government debt ratios of almost 300 percent can be reduced without causing high inflation. In order for this to succeed, the economy needs to grow quickly enough or the growth rate has to exceed the real interest rate, for instance as a consequence of financial repression.

If, on the other hand, the economy is growing slowly, debt reduction will require painful adjustments. Whether this really leads to inflation largely depends on the monetary policy response. As long as the central bank maintains the objective of price stability, any increase in borrowing will require fiscal adjustments. The relationship described in equation (2) is essential for understanding the interrelationship between fiscal and monetary policy. It describes the relationship between the government's long-term interest burden and the primary surplus that has to be generated if the real interest rate is higher than the real economic growth rate (otherwise solvency would always be guar-

anteed). In order to rule out sovereign default, the interest burden ultimately has to be covered by primary government surpluses generated in the future. Any rise in the debt ratio (like a rise in the ratio of real interest rate to economic growth) will require adjustments either in the form of higher tax revenues in the future or spending cuts.

This correlation could be eased if the central bank permanently tolerated stronger growth of its money supply, the monetary base¹¹³ (in connection with a constant rise in the rate of inflation), and uses this to increase the revenue from non-interest bearing money creation (seigniorage). As Sargent and Wallace (1981) indicated, the expectations of the market participants that such a shift in policy will be inevitable in the future are enough to trigger an immediate rise in the price level. But the real gains that can be obtained from an anticipated inflation tax are fairly limited: revenues from non-interest bearing money creation only constitute a small share of public revenue. What is more, as inflation rises, the demand for central bank money (and therefore the basis for the inflation tax) decreases. In addition, it does make a difference whether market participants expect a permanent expansion of the monetary base or whether they trust that the monetary policymakers will guarantee price stability in the long term. If the latter is the case, even a strong but temporary expansion of the monetary base will not bring about any inflationary effects.

The key significance of expectations on future policy can lead to multiple self-fulfilling equilibria: as long as

market participants count on price stability, nominal and real interest rates will remain low, even if inflation is moderate, which makes debt servicing manageable. If, however, high inflation is expected and nominal interest rates consequently rise sharply, because financial markets demand a premium on the risk of asset devaluation through inflation, the high real interest burden can jeopardize solvency. The pressure on monetary policy to shift to an inflationary policy mounts, the more sharply the government debt ratio rises.

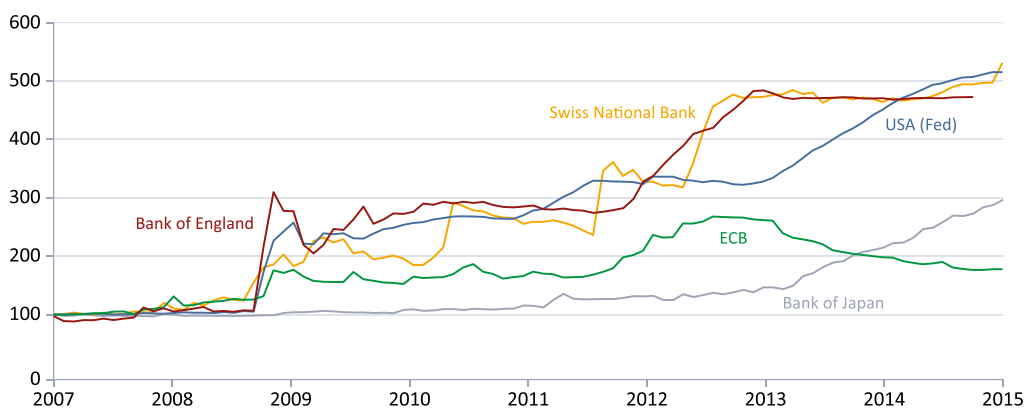
Owing to unconventional monetary policy measures since the onset of the financial crisis, the balance sheets of central banks around the world have been massively expanded¹⁴ (see chart 19). This has often raised fears that central banks will see themselves as needing to buy up government bonds by creating central bank money. In reality, the large expansion of central bank balance sheets is initially a reactive flight by private investors into safe investments, to which central banks have been responding by providing liquidity. Despite the strong expansion of the monetary base, the M3 monetary aggregate in the euro-area private sector has stagnated; lending in the euro area has even decreased (see chart 20). The rate of inflation (measured in terms of the consumer price index) also declined in

the euro area and in Germany, to below 2 percent in 2013 and 2014 and even below 0 percent in the first two months of 2015.

The answer to the question of whether the creation of base money will also cause inflation to rise in the future hinges in great measure on the ability to reverse a rise of inflation while stabilizing economic activity. Schularick and Taylor (2012) show that no rise in inflation rates was observed following a period of high debt overhang in the course of financial crises. Clearly, such episodes are characterized by a regime of monetary dominance. The low nominal interest rate even for long-dated government securities in Germany, but also in the USA and Japan, indicate that the markets expect this regime to continue for a long time.

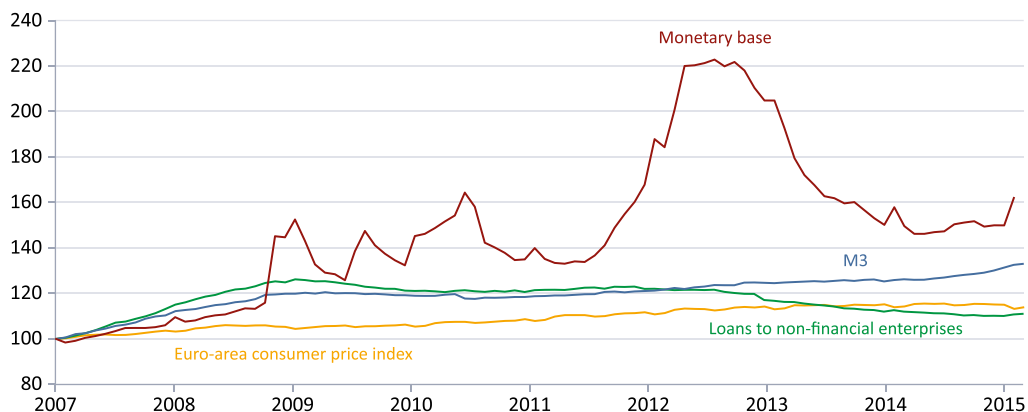
Unexpectedly low rates of inflation cause a rise in the real burden of nominal indebtedness. This could, however, be lowered through a surprise increase in prices as long as the economic actors do not anticipate such a rise and government bonds are not inflation-indexed. Such surprise inflation would be akin to “printing money”. The longer the average term of the government securities, the greater the beneficial fiscal effect. In times of spending shocks, a shift to a regime of fiscal dominance becomes more likely, in which

Chart 19: Expansion of central bank balance sheets since the start of the financial crisis



Source: European Central Bank and national central banks.

Chart 20: Euro-area monetary growth, 2007 – 2015
all indices: 2007=100



Source: European Central Bank.

the central bank would be forced to allow inflation to increase in order to fend off an impending sovereign default.¹¹⁵

According to the fiscal theory of the price level, adjusting the price level accordingly in response to severe shocks can be ideal.¹¹⁶ Indebtedness, expressed in nominal terms, leaves open the option of surprise inflation in order to cushion strong shocks without an explicit sovereign default. The real burden from nominal indebtedness would be reduced by a rise in prices. Past historical experiences with episodes in which runaway inflation (with annual price increases of over 25 percent) were deliberately used as a debt relief instrument, however, show that the misuse of these options can entail high real costs.¹¹⁷

To this end, explicit institutional safeguards were introduced in the euro area in order to rule out such a possibility. The European Central Bank, as an independent entity, is responsible for ensuring price stability. The Maastricht Treaty prohibits the ECB from buying government securities on the primary market, a policy designed to ensure a regime of monetary dominance. The option of “printing money” is no longer in the realm of individual Eurozone governments. They have to deliver sufficiently high primary surplus-

es by adjusting tax revenue and/or government spending. Individual Eurozone governments, in effect, have to borrow in a currency that they cannot create themselves.

Doing away with the option of inflation tax imposes tight limits on government debt. In addition, it exacerbates the problem of self-fulfilling prophecies. As long as investors expect debt to be serviced, they will buy debt at low interest rates. If, however, they fear that government debt might not be sustainable in the long term, the risk premiums they demand will rise sharply, which means the real interest charge will make debt servicing even more difficult. Feedback effects can then set in motion a spiral leading to a sudden drying up of financial flows. If under such conditions credible debt relief is not possible through the generation of primary surpluses, real debt rescheduling – the devaluation of creditor claims through a (partial) haircut – is ultimately unavoidable. Even a problem that was originally purely a liquidity problem can then quickly become a solvency problem. If a country is nominally indebted in its own currency, the domestic central bank could contain such liquidity problems; however, the Eurozone’s unusual makeup and framework make such policy responses more difficult.

Again, the danger of such mood swings does indeed increase in line with rising government debt ratios. This is an important argument for stabilizing the government debt-to-GDP ratio at a low level in the long term so that there is enough scope for a temporary increase in the debt ratio in times of crisis. Also, a monetary policy that is flexible in all directions can make an important contribution to stabilization by fighting deflationary dangers while at the same time preventing an excessive rise in the real debt burden as a consequence of unexpectedly low inflation. As recent events in Japan have shown, the threat of regime change increases if it is not possible to break out from a phase of prolonged stagnation with the government debt ratio continually rising. The greater the fixation on price stability, the greater the threat of a drastic regime change.

6.2 Multiplier effects of expansionary or contractionary fiscal policy

Active fiscal policy only played a minor role as a stabilizing instrument in the past few decades because the strength of multiplier effects was strongly contested for a long time. Modern studies show that the effect of debt-financed government spending strongly depends on the specific economic framework conditions.¹¹⁸ If the level of production is determined by the supply side alone, there will only be very small, possibly even negative multiplier effects. If economic activity is constrained by insufficient demand, the multiplier effect of government spending can be very high. Dynamic equilibrium models with price rigidities show that its effect mostly depends on the effectiveness of monetary policy, the exchange rate system as well as the economic situation. Expectations of market participants on the future path of fiscal and monetary policy are also of central importance. If they expect a debt-fueled surge in government spending to be

financed later on through anti-cyclical expenditure cuts, the multiplier effects will be much stronger than if future tax increases are expected (which induces a negative effect on wealth).

The monetary policy response is especially important in this context. As long as monetary policy is in the position to stabilize cyclical fluctuations, demand shocks and thus also changes in government spending will hardly affect production. If, for example, the central bank reacts to a rise in government spending by raising interest rates, then the additional government demand will be compensated for through a dampening of aggregate demand; there will be no multiplier effect. The more stabilization through monetary policy is supported by changes in the exchange rate, the more effective it will be. In a regime of fixed exchange rates, monetary policy has to act within tight constraints.

As became apparent during the financial crisis, economic stabilization through monetary policy can also come up against tight limits for other reasons. As nominal interest rates cannot be negative, economic stimulus using traditional monetary policy instruments is no longer possible if interest rates are close to zero. Under such conditions, expansionary fiscal policy can be an effective substitute for monetary policy-based stabilization. A temporary increase in government spending can make up for the drop in private demand without the central bank having to respond by raising interest rates.

The experience of the financial and economic crisis since 2008 provide substantial empirical data to estimate an interval for the level of the multipliers.¹¹⁹ Various econometric studies arrive at fairly similar results. Ramey (2011) estimates the interval to range from 0.8 to 1.5; Spilimbergo et al. (2009) as well as Coenen et al. (2012) find values ranging

from 1 to 1.5. The effect of expansionary fiscal policy is especially strong when it concentrates on the phase in which the scope of traditional monetary policy is limited because of the zero lower bound. If government spending rises over the long term, the multiplier effects will be far lower. They are also lower in open national economies with strong international interdependencies, as part of the additional demand created by general government leaves the country.

If monetary policy cannot balance asymmetrical demand shocks in a regime of fixed exchange rates or in a monetary union, shocks that have varying impacts on different regions require the application of other stabilizing instruments. These can be automatic stabilizers such as unemployment insurance or personal income tax. They allow government deficits to rise in times of recession and to correspondingly run surpluses in good times, consequently reducing economic fluctuations. If, however, no such stabilizers are applied, these fluctuations will increase pro-cyclically.

The fiscal provisions of the Maastricht Treaty are relatively rigid, which is not always helpful in a monetary union. A fiscal pact was therefore recently adopted in order to impose limits on structural deficits and thus allow deficit margins in order to cope with cyclical ups and downs. Even so, it should be noted that the more the stabilizing function is performed through cyclical transfers between the affected regions, the more effective it will be.¹²⁰ Thus, in the US around 30 per cent of individual US states' tax gaps are plugged by federal automatic stabilisers.¹²¹

The stabilizing effects of fiscal multipliers work best whenever a debt-funded rise in government spending in a recession is financed through spending cuts during economic booms. As pointed out by Corsetti et al. (2010) it would be ideal

to combine stabilizing measures during a financial crisis with the announcement of strict consolidation in the future. This is predicated on a credible commitment to consolidate in the future. Nevertheless, there is disagreement among economists as to what extent stimulus measures or, conversely, fiscal consolidation measures should be taken during a financial crisis if credibility is lacking. Again, this depends heavily on the specific circumstances.

An important variable here is how capital market rates will react to the announcement of a specific consolidation path. As an increase in the government debt-to-GDP ratio makes it more difficult to enforce sustainable consolidation paths, there is a danger – particularly in the case of heavily indebted governments – that market participants will undergo abrupt mood swings, which can lead to a self-fulfilling explosion of government debt-to-GDP ratio. The attendant increase in risk premiums will further exacerbate the situation and make it more and more difficult to comply with consolidation. For such governments the scope for active stabilization policy is therefore narrowly limited.¹²²

Proponents of the idea of “expansionary consolidation” therefore advocate immediate implementation of drastic austerity measures while the crisis is in progress. According to the concept of expansionary consolidation, rapid consolidation does not necessarily have to reduce economic activity, but could, contrary to the traditional Keynesian view, possibly even cause it to increase. This is based on the idea that rapid implementation of consolidation will be interpreted by the markets as a confidence-building measure, which in turn will be rewarded by low interest rates (falling risk premiums). But at the same time the following paradox can ensue: if the government austerity measures amplify the economic downturn, fears could be triggered that a fall in tax reve-

nue could lead to a further deterioration of government finances, thus leading to an increase in risk premiums on government securities. The more the austerity measures hinder growth, the more counterproductive it would be to attempt rapid consolidation.

Recent empirical studies, however, are very skeptical concerning the possibility of expansionary consolidation. Alesina and Ardagna (2012) argue that consolidation programs which mainly concentrate on cutting public spending could have an expansionary effect; however, more recent papers question the robustness of these findings. They cite other factors – such as deliberately lowering the nominal interest rates in order to induce currency devaluation – as being crucial for the growth stimuli.¹²³ Cushioning through a relaxed monetary policy as well as an exchange-rate-induced improvement in competitiveness are usually hallmarks of successful consolidation programs.

The critical challenge lies in developing mechanisms to ensure stronger commitment to consolidation in economic boom times. The introduction of fiscal rules represents a promising avenue. The effectiveness of fiscal stabilization can be amplified by independent institutions (such as fiscal advisory councils) which assess compliance with these rules in the budgetary process.

To governments which are currently benefiting from the negative long-term real interest rates because investors are seeking refuge in safe investments, expansionary consolidation ultimately does not make sense. Increased investment in productive infrastructure could improve debt sustainability, as long as real interest rates are lower than the real growth rate. In this case, fiscal consolidation during a recession would definitely be counterproductive, as debt sustainability is not the problem. Although it is conceivable that

the short-term flight to safe investments could rapidly reverse itself, a sudden rise in the interest rate would jeopardize debt sustainability thanks to a high real interest burden: maturing short-term loans would have to be refinanced with more expensive loans. A long-term financing of government securities with terms of 10 or more years can, however, hedge against this risk.

7. Legal restrictions on government debt

The German constitution, or “Basic Law,” was amended in 2009 to incorporate the “debt brake” as part of the second reform of the federal system (Föderalismusreform II). Constitutional government debt ceilings are not a recent invention, but are deeply enshrined in the German constitutional tradition. Given that absolute monarchs were perpetually in debt, the constitutions of the 19th century provided procedural safeguards against exorbitant debt by making borrowing contingent on parliamentary approval. This parliamentary legal reservation still holds today, although its limiting function is insignificant in today’s parliamentary system. Some constitutions, such as the Bavarian constitution of 1818, already included a substantial restriction, as borrowing required an urgent or extraordinary government need as justification. This requirement was adopted in the Constitution of the German Reich of 1871 and tightened by the Weimar Constitution such that not only was an extraordinary need required, but the borrowed funds could only be used for “income generating purposes”. This provision was then retained in the Basic Law in 1949.

Article 115 of the Basic Law remained unchanged until 1969, when it was amended as part of the fiscal reform in order to enable the implementation of a Keynesian anticyclical fiscal policy and to force the government to incorporate macroeconomic exigencies when taking decisions on government borrowing. This meant that government investment spending should normally be the upper limit of net new debt (the “golden rule”). Future burdens from borrowing should

be offset through expenditure benefitting future generations. At the same time, the amended article provided for the option of breaching the limits set by the article “to protect against a macroeconomic imbalance”. The federal states used this as a model to establish essentially identical provisions. The 1992 Maastricht Treaty added to these constraints the permanent public-sector national limits of 3 percent of GDP for the annual public deficit and 60 percent of GDP as the upper limit of government debt. These have since been modified and amended by the Stability and Growth Pact and most recently by the fiscal pact, but have not been fundamentally changed. Nonetheless, the objective of a balanced budget is now being emphasized more strongly.

Given the sharp rise in government debt and the federal states’ debt problems in the aftermath of reunification, the constitutional legislators thought the national regulations were insufficient and sought to replace them with stricter limits, similar to the Swiss model – so-called “debt brakes”. Article 109 paragraph 3 of the Basic Law contains three material elements: firstly, the general no-borrowing principle; secondly, a clause for the flexible adjustment to cyclical trends; and thirdly, a derogation. The article requires the budgets of the federal government and the federal states to be uniformly balanced by 2016 (the federal government) and 2020 (the federal states), essentially without revenues from borrowing. Only the Federal Government is allowed to regularly borrow up to 0.35 percent of gross domestic product. This borrowing does not have to be tied to investment expenditure, where-

as the ban on structural indebtedness applies in full to the federal states. Derogations should nevertheless be permitted for the Federal Government and the federal states “to take into account, symmetrically in times of upswing and downswing, the effects of market developments that deviate from normal conditions“. This cyclical component should help to adapt fiscal trends to cyclical trends. It increases and reduces the fixed debt limit according to the economic situation. Furthermore, this provision allows for exceptions in the event of natural disasters and other uncontrollable and financially significant, extraordinary emergency situations; this lattermost provision was inserted by constitutional legislators with the financial crisis of 2008/2009 in mind. However, such increased borrowing needs to be accompanied by a repayment schedule. The states were obliged to enact appropriate regulations. Twelve federal states have already implemented the provisions (eight by amending their state constitutions and four through a simple Act), while four had not yet implemented the debt brake as of March 2015. Although the federal and state debt brakes apply to special funds, they do not apply to independent public corporate entities.

The structure of the German debt brake is modelled mostly on the provision contained in the Swiss Constitution, which was passed in a national referendum in 2001 and came into effect in 2007 after a transition phase. It contains the obligation “to balance expenditure and revenues in the long term“. The Swiss cantons use their own, in some cases older, fiscal rules that are structured very differently. Legal restrictions can also be found in individual states of the United States of America. Known as *balanced budget requirements*, they also vary widely between states. They apply in some cases to the setting of the budget, in others to the passage of the budget and in still others, to implementation, i.e. that the budget has to be bal-

anced at the end of the year. This has to be jurisprudentially and technically distinguished from borrowing constraints, which can range from an outright ban to restrictions on borrowing expressed in currency amounts to procedural requirements, such as requiring a referendum or a “*supermajority*“, i.e. a majority of parliament that is much greater than 50 percent. However, in essence, debt limits and balanced budget provisions work in a fairly similar manner.

The efficacy of legal limits on government debt depends on numerous factors and does not lend itself to generalizations. First of all, it depends on how strict the limit itself is: does it govern the creation or the passage of the budget, or implementing it such that at the end of the fiscal year the limits really have to be observed? Secondly, it is crucial how strict the stipulations are. Absolute or relative constraints in terms of distinct parameters such as investment, GDP shares or percentages of the overall budget are all suitable criteria. Flexible exemption clauses generally open up possibilities for avoiding a straitjacket by allowing the set limit to be breached in order to prevent a macroeconomic imbalance, as was permitted under the earlier version of the Basic Law.

Finally, the effectiveness depends on whether independent authorities can carry out controls. Inspections by the Federal Court of Auditors can be carried out regularly, but do not entail sanctions. In order for the judiciary to effectively take judicial control, the debt limit has to be enshrined in the constitution. Furthermore, the Federal Constitutional Court has to actually be authorized to verify compliance with debt limits. For instance, US courts, like most European constitutional courts, are not authorized to verify compliance with *balanced budget requirements*. Germany’s Federal Constitutional Court is an exception. Yet

enforcement of the European rules by European Union institutions is essentially a political decision as, pursuant to Art. 126 of the Treaty on the Functioning of the European Union (TFEU), the final decision remains vested with the EU Council as a political organ. Even the monitoring of the debt limits by the German Federal Constitutional Court and the state constitutional courts has not been very successful thus far, as firstly, the courts regularly issue rulings only years after the fiscal periods have been completed and secondly, then only identify a violation of the constitution, but cannot redress or punish it in any way.

The limited effectiveness of legal debt limits is due to often inevitable loopholes, alternative possibilities and evasive strategies. The experiences of individual US states are particularly instructive, but often apply elsewhere, especially also to Germany. In some US states, federal debt limits frequently lead to debt or certain expenditures being shifted to another level of government. This can be avoided by adopting uniform rules at all levels, yet these often prove non-enforceable. Yet the severest form of evasive action is the generally unlimited option of forming legally independent funds or corporate entities that are authorized to borrow independently and for which the debt then can be serviced by the public sector from the overall budget, e.g. *public private partnerships (PPP)*. In the USA, only around half of the government budgets nationwide are therefore covered by the debt limits. The Basic Law of Germany also does not preclude this possibility. Consequently, one frequent problem with rigid debt limits is that they cause both the relevant expenditure and its debt-based financing to be “offshored” from the regular budget. Further possibilities of circumventing the limits include creative accounting; financing through leasing, which does not qualify as borrowing; or the assumption by the government of long-term liabilities

(e.g. corporate pensions) against lump-sum private advance payments; and also derivative or other hedging transactions. This way, hidden loans running into the billions are raised.

The assessment of the overall effectiveness of legal debt limits is therefore mixed. In their immediate field of application debt ceilings can show impressive effects, which are substantially influenced by the specific design.¹²⁴ However, they also significantly trigger circumventive or evasive actions which lead to debt being shifted to other levels of government or to legally independent funds or public legal entities.¹²⁵ Debt limits are virtually impossible to enforce effectively against opposition from political decision makers, especially among governments and parliaments. If statutory provisions enact a previously existing broad consensus among political decision makers, they can substantially promote the effective implementation of the appropriate objectives. This is probably why the debt brake is more effective in Switzerland.¹²⁶ In this case, the answer can be as simple as enacting laws. There are also jurisprudential misgivings in some quarters concerning what they see as weighing down the constitution by imposing economic-policy objectives on it.

8. Conclusions and recommendations

8.1 Conclusions

High government debt can lead to massive problems for society. However, contrary to prejudices held by some, government debt as such does not necessarily have to be detrimental for government and society. Depending on the situation, (additional) government debt can either increase or decrease welfare. Misunderstandings about government debt abound in the public, and these misconceptions have to be corrected. It is thus not the absolute amounts of debt and annual deficit which determine government debt, but rather these two factors as a percentage of a nation's gross domestic product (GDP), which is referred to as the government debt-to-GDP ratio or deficit ratio and which is based on the Maastricht Criteria.

Government debt cannot be compared with private debt, but must rather be seen in the context of economic circular flow systems. This also applies to future debt burdens, which are not identical with the tax burden that future generations will have to shoulder in order to fund amortization and interest. The future burden in particular depends on the extent that private investment is crowded out by public sector borrowing and on the amount of public investment financed through borrowing.

An expansion of government debt as such does not necessarily have to cause inflation. As long as monetary policy ensures price stability, a surge in borrowing, which would threaten the sustainability of debt, requires future fiscal modifications. Historically, no surges in the infla-

tion rate have been observed for a long time after periods of high debt overhang during financial crises. This is borne out by low, even falling inflation rates in the past few years, despite massive expansion of central bank money in many countries around the world.

Although government debt does not have only one unique cause, macroeconomic developments are primarily responsible for it. Economic growth has a particularly strong influence on cyclical and trend movement of the government debt-to-GDP ratio. The extremely high rates of increase in the debt ratio in the aftermath of banking crises are prominent. Moreover, politico-economic determinants add to the explanation, in particular as to why there is frequently no consolidation in good times. In this context, changes in social values or the welfare state as an engine of a rise in indebtedness play a subordinate role.

Considering the different causes and macroeconomic interrelationships, there is no specific percentage of government debt-to-GDP ratio which can be defined *ex ante* as a threshold beyond which governments should expect conditions for obtaining credit on capital markets to deteriorate or the economy as a whole to become caught in a downward spiral. This means that high levels of local currency borrowing are, for instance, far less dangerous than indebtedness to non-residents or in foreign currency.

It has to be the public sector's fiscal policy objective to secure the sustainability of government debt, not so much to reduce it to zero or to a pre-determined

absolute level of government debt. Sustainability is also influenced by various factors. Again, economic growth has to be mentioned first. High growth automatically reduces government debt-to-GDP ratio, by generating higher tax revenues and leading to lower social welfare expenditure, i.e. lower deficits or even surpluses. Moreover, the debt-to-GDP ratio falls in inverse proportion to GDP growth.

If the real interest rate on government debt is perpetually lower than the real economic growth rate, the debt is sustainable. If the real interest rate is higher than the real economic growth rate in the long run, the primary balance – the difference between current public revenue and public expenditure less interest payments on existing government debt – has to show a surplus. Otherwise the share of interest payments in the public budget will further increase and limit the public sector's scope.

Moreover, the development of government debt has to be viewed in conjunction with the development of government assets, which do not chart in government debt-to-GDP ratio. Of course the relationship between government assets and government debt cannot be compared to the balance of private assets and private debt, problems of measurement being just one of the reasons. At the same time, both are connected through public sector investment activity, and borrowing for asset building should be viewed more favorably than borrowing for consumption. In addition, the sustainability of government debt also depends on the level of implicit debt as well as the covert government debt outsourced to funds and other quangos. Finally, the potential impact of demographic developments on economic growth also influences sustainability.

The effects of legal debt limits on government borrowing vary from one country to another. In Switzerland, the experiences have tended to be positive,

while the US experience has been more the opposite. In their immediate area of application such debt ceilings can have considerable effects, which, admittedly, depend on their specific design. But at the same time, they often provoke circumvention and evasive action, through which indebtedness is merely shifted to other federal levels or legally independent legal entities, without meaningfully reducing total government debt. Similarly, the German Basic Law's debt brake does not sufficiently obstruct such possibilities for evasion.

8.2 Recommendations

Germany's present government debt-to-GDP ratio needs to be reduced in the long run in order to guarantee sustainability if the real interest rate persistently exceeds the real economic growth rate. To this end, it is enough to keep further government debt growth lower than the growth rate of nominal GDP. It is not necessary to use budget surpluses to pay down government debt.

The short-term stabilization of the economy in times of crisis by increasing public spending and borrowing to match it does not necessarily run counter to the objective of long-term consolidation.

If the real interest rate is persistently lower than the real rate of economic growth, the sustainability of public finances is assured. In this situation, the government can expand both sides of its balance sheet without incurring financing problems. It is then possible to borrow by issuing long-term government bonds on the liability side and to increase the value of those assets which directly generate earnings and indirectly enhance productivity on the asset side of the balance sheet. Thus, GDP growth can contribute increasingly toward consolidating the government debt-to-GDP ratio in the long run.

Fiscal policy fixation on reducing government debt makes just as little sense as lowering government debt to zero. Besides, fiscal policy is obliged both economically and legally to also take into account the objectives of economic growth and high employment. Consequently, it should advocate a level of public investment that is indispensable for future economic growth. This is even more pertinent as the thesis of expansionary consolidation, i.e. using a rigorous government austerity to enhance economic growth is highly controversial.

Given the strong link between government debt crises and banking crises, enhancing the financial sector's resilience to crises is also advisable in terms of the long-term stabilization of the government debt-to-GDP ratio. Stronger regulation of the financial sector can significantly contribute to this end.

In the last twenty years public sector investments dropped dramatically. Despite all the problems in drawing a line between investment and consumption expenditure in government budgets, this trend should be reversed and public-sector investment should be increased. This is even more pertinent as the incentives for the financing of public investments that had been included in the borrowing provisions of Article 115 of the Basic Law were eliminated upon the adoption of the new constitutional debt brake in 2009.

Finally the transparency of the public budget should be improved. The traditional cameralistic (single-entry) government accounting system is in essence a simple list of revenue and expenditure. It does not reflect altogether, or does not sufficiently reflect, implicit government debt, the indebtedness of partially government-owned entities, government funds and quangos (e.g. social insurance), on the one hand, as well as the net asset position of the public sector, on the other.

However, the jury is out on whether the situation will be improved by introducing double-entry accounting or by reporting additional data within the framework of, or as a complement to, single-entry accounting. At any rate, political decision makers as well as the public require greater transparency, higher-quality government accounting and a much larger volume of information on the state of public finances, in order to make a realistic assessment of the fiscal scope and to make sensible decisions that are sustainable for the future.

Notes

- 1 See the following link for the videos of all the lectures: <http://www.jfki.fu-berlin.de/faculty/economics/research/holtfrerich/symposium/index.html>.
- 2 Holtfrerich, Carl-Ludwig (ed.). *Government Debt in Democracies: Causes, Effects, and Limits*. Special Issue of *German Economic Review*, 15 (2014), pp. 1-271.
- 3 Unfortunately, as of September 2013 Wolfgang Streeck's involvement in the working group's deliberations and the compilation of the report ended due to a research project in the United States.
- 4 I would like to thank the following student assistants who, over various periods of time, were very committed to and involved in the coordination of the project and assisted with the research: Antonia Carl, Farina Casselmann, Stephanie Feser, Jonas Horstkemper, Christian Kusch, Christian Lüdde and Valerie Ross.
- 5 In economic literature and accordingly in language used in economic policy the same phenomenon can be found for the term "debt-to-GDP ratio". As this ratio can be calculated for every sector of the economy, we prefer the term "government debt-to-GDP ratio" for the public sector version of this ratio.
- 6 The twice-yearly "Eurobarometer" survey asks the question "In your opinion, what are the two most important problems our country is presently facing?" Since the second half of 2010 government debt has been on the list of possible answers. Whereas only 14 to 19 percent of the surveyed EU average chose this option, in Germany it was 17 to 40 percent of those surveyed. See European Commission (2010-2014).
- 7 On this see from the 1990s: Kantzenbach (ed.) (1996). And from the Bundesbank: Schlesinger et al. (1993). Greiner et al. (2006), Fincke and Greiner (2011), Burret et al. (2013) are newer contributions.
- 8 In the 1932 election campaign, the Democratic Party candidate Franklin D. Roosevelt accused President Herbert Hoover of running up debt, only to incur even higher budget deficits after taking office.
- 9 Federal Reserve Bank of St. Louis (2013).
- 10 The increase of the value added tax by three percentage points only came into force on 1 January 2007 and additional public revenue was only generated as of that year.
- 11 The government debt-to-GDP ratio rose from 65.2 percent in 2007 to 82.4 percent in 2010. In 2012 it was 81.9 percent. According to the German Federal Ministry of Finance (Bundesfinanzministerium, or BMF) the government debt-to-GDP ratio due to bank bailouts was up by 11.1 percent of GDP in 2012. The measures taken during the EU debt crisis (European Financial Stability Facility, EFSF; European Stability Mechanism, ESM) were 2.5 percent in the same year. The BMF expects that the government debt ratio will drop to around 69 percent of GDP due to cutbacks in the portfolio of the bad banks of the WestLB and Hypo Real Estate until 2019. See also Bundesministerium der Finanzen (2013), p. 32.
- 12 See Kastrop et al. (eds.) (2010), p. 86. In its meeting of 27-28 November 2008 the Scientific Advisory Council to the Federal Ministry of Finance (BMF) sent a letter to Minister Steinbrück, in which it proposed a substantial stimulus package to stabilize the German economy following the Lehman insolvency, which it linked to the demand to introduce a debt brake, as it believed that this could "strengthen the trust of investors and consumers in the soundness of public finances and would therefore also help increase the effect of the current fiscal momentum" (p. 67). See Wissenschaftlicher Beirat beim BMF (2008), pp. 63-68. On 4 December 2008 Ingolf Deubel and Peter Struck published an article in the *Frankfurter Allgemeine Zeitung* suggesting the adoption of a German debt brake, arguing along similar lines.
- 13 See in particular Reinhart and Rogoff (2009), but also Konrad and Zschäpitz (2010).
- 14 In the last eleven years a large part of German savings have been invested abroad, as the very high German current account surpluses show. From 2006 to 2014 these were between 5.6 and 7.6 percent of GDP. They mirror German net capital exports. Instead of the aforementioned domestic sectors, non-residents borrowed from Germany to the extent of the current account surpluses. From 2002 to 2014 the accumulated current account surpluses amounted to 1,769 billion euro. Deutsche Bundesbank (2015).
- 15 Dickson (1967). This process of the modernization of public finances had already begun around 100 years prior to the English Glorious Revolution in the Dutch province of Holland; see Hart (1997); Gelderblom and Jonker (2011).
- 16 The Prussian king made his first constitutional promise in the financial edict of 27 October 1810, a second in the regulation of 22 May 1815 and the third in the law on government debt of 17 January 1820.
- 17 This here includes only loans with a maturity of more than one year borrowed for the purpose of funding expenditure that is not covered by other revenue. These have to be distinguished from short-term loans, which should only bridge cash deficits that result from short-term disparities between revenues and expenditure during current fiscal years (see § 18 of the *Bundeshaushaltsordnung* (BHO)).
- 18 In England perpetual bonds already emerged in the 18th century (pension debt, so-called funded debt). The creditor is not entitled to redemption payments, but is only entitled to the payment of an agreed interest (his pension). The debtor (government), however, has reserved the right to repay debt – e.g. if interest rates are low – in order to borrow again at more favorable conditions.
- 19 One can use figures from 2013 to illustrate the relationship between public net and gross borrowing at federal level. In 2013 net borrowing was 22.1 billion euro (BMF Monthly Report, January 2014), while gross borrowing was more than ten times higher, i.e. 238.6 billion euro (BMF Monthly Report, March 2014).

- 20 On recording public net wealth with the assistance of double-entry accounting, see Box 2 below section 4.6.
- 21 The debt character of implicit government debt can, however, not be completely denied. This becomes clear when one looks at such obligations of private corporations. When preparing the balance sheet, it is self-evident that, for instance, obligations to present and former employees to pay corporate pensions have to be taken into account in the form of reserves on the liability side of the balance sheet. Similarly such claims on private employers self-evidently form part of the assets of the claimant. In analogy, the pension entitlements vis-à-vis the public sector can also be seen as near-asset entitlements. If one includes the implicit government debt in a country such as Germany or any other country with a similarly well-developed welfare state, then the level of government debt will increase to several times the annual economic output.
- 22 Lerner (1948), p. 256. Section 5 addresses the problems posed by this point of view.
- 23 On this and the following passages on the history of economic theory see Holtfrerich (2013, 2014).
- 24 Wagner (1863), p. 1.
- 25 Keynes (1924). In costly wars this “means of taxation” is regularly used. In German history, high inflation has already twice led to de facto government debt relief: after each of the two World Wars.
- 26 See also von Hayek (1930), pp. 387-429, who pointed out that the use of higher savings through more investment activity plays an important role also in macroeconomic context.
- 27 Gandenberger (1980).
- 28 Lindholm (1950), p. 571, already juxtaposed these alternatives. Also cited by Dettweiler (1969), p. 123.
- 29 Dolls et al. (2012).
- 30 Eucken (1964), pp. 174, 177. See also Barro (1979).
- 31 Von Stein (1871), p. 666.
- 32 Sachverständigenrat (2007), para. 116, p. 73.
- 33 Wissenschaftlicher Beirat beim Bundesministerium der Finanzen (2007). Bundesverfassungsgericht/BVerfG, 2 BvF 1/04 of 9 July 2007, para. 133.
- 34 Wissenschaftlicher Beirat beim Bundeswirtschaftsministerium/BMWi (2008), p. 20.
- 35 Eichengreen (2002).
- 36 Jordà et al. (2013b).
- 37 Laeven and Valencia (2012), Schularick (2012).
- 38 Laeven and Valencia (2012).
- 39 Schularick (2012).
- 40 Schularick and Taylor (2012).
- 41 Jordà et al. (2013a).
- 42 The seminal work to read is Buchanan and Wagner (1977).
- 43 See section 5.1.
- 44 Nordhaus (1975), Tufte (1978). Most recently with a specific focus: de Haan (2014).
- 45 Cf. Roubini and Sachs (1989); for further sources see Wagschal (1996), pp. 95-109, 218-224.
- 46 Initial approach in: Kirschen (1964), p. 227.
- 47 Schick (1993), Steinmo (1995), Wagschal (1998).
- 48 Alesina and Tabellini (1990), Persson and Svensson (1989).
- 49 Cf. Wagschal (1996), pp. 119-126. and Wagschal (1998), pp. 229-232. Pettersson-Lidbom (2001).
- 50 Cf. e.g. Roubini and Sachs (1989), Persson and Tabellini (2003), pp. 81-94.; 179-183. Schaltegger and Feld (2009).
- 51 Alesina and Drazen (1991).
- 52 Cf. de Haan and Sturm (1997).
- 53 Alesina and Perotti (1995), De Haan et al. (1999), Perotti and Kontopoulos (2002).
- 54 Cf. von Hagen (1992), Hallerberg et al. (2009).
- 55 Niskanen (1968), idem (1971), pp. 36-42.
- 56 Dahrendorf (2009).
- 57 Deutsche Bundesbank (2014b).
- 58 Deutsche Bundesbank (2011, 2013).
- 59 See Sachverständigenrat (2007), para. 27, pp. 22-24.
- 60 For the derivation of this relationship also see Kirchgässner (2005).
- 61 A surprising strong increase of the price level could on a one-off basis, however, bring down the real burden of the nominal non-inflation-indexed debt. As soon as the economic agents anticipate such a rise, this is no longer possible (see section 6.1 on government debt, monetary policy and inflation).
- 62 On seigniorage see e.g. Black (1992).
- 63 See e.g. Diamond (1965).

- 64 Cf. Phelps (1961), von Weizsäcker (1962), Frey (1970).
- 65 For an overview of historical developments see e.g. Jordà et al. (2013a).
- 66 See e.g. Blanchard and Weil (2001).
- 67 Cf. Feldstein (1977), Homburg (1991, 2014).
- 68 A more detailed presentation can be found in von Weizsäcker (2014).
- 69 For more on how this relationship is derived see also Kirchgässner (2005).
- 70 Deutscher Bundestag (2012), p. 80.
- 71 Wagschal (1996).
- 72 Ziffzer (1980), p. 123.
- 73 Reinhart and Rogoff (2010).
- 74 Petersen et al. (2012), p. 2. For a more extensive discussion of the negotiation process see: Dyson and Featherstone (1999), James (2012).
- 75 The ECB is the source of the data in this paragraph, in particular its “Statistics Pocket Book”, which is updated on a monthly basis and can be accessed online.
- 76 Romp and de Haan (2007), p. 6. The increasing use of public private partnerships (PPP) since around 1990 to carry out public investment projects is evidence of scarce public resources, but could also be an indication of the higher productivity of private investments in which the public sector would like to participate.
- 77 Streeck and Mertens (2011) recently also wrote on these topics.
- 78 The net wealth of the government sector in Germany, i.e. the value of its gross assets minus its debt, fell from 800 billion euro in 1991 to almost zero euro in 2012. See Deutsche Bundesbank und Statistisches Bundesamt (2013). These statistics are controversial: it is far more difficult to assess gross assets of the government sector than those of private enterprises, as usually there are no market prices for the components of government assets. The Federal Statistical Office calculates the public sector’s capital stock from previous public investments. However, given the outsourcing of certain parts of public services to the private sector and genuine privatization of assets, this approximation may be too imprecise.
- 79 Aschauer’s article (1989) prompted this more recent research.
- 80 Sturm et al. (1996).
- 81 Romp and de Haan (2007).
- 82 KfW (2013), Eberlein and Klein-Hitpaß (2012).
- 83 A summarized description of cameralistic (single-entry) and commercial accounting along with their respective strengths and weaknesses can be found in: Sturm (1999), pp. 14-42. See also: Diemer (1996), pp. 9-52. Diemer recommends switching from cameralistic (single-entry) to double-entry accounting.
- 84 Burth and Gnädinger (2015).
- 85 In this the budget items are essentially arranged according to the products of the respective public administration, e.g. of municipalities into “fire brigade”, “sports facilities”, “roads”, etc.
- 86 Burth and Gnädinger (2015).
- 87 Sachverständigenrat (2007), p. 75.
- 88 The municipality of Wiesloch in the state of Baden-Württemberg took the lead. In a pilot project based on double-entry accounting it drew up an opening balance sheet for 1 January 1996. See: Raupach and Stangenberg (2009), p. 7.
- 89 Another explanation relates to the privatization of public tasks and assets as is being currently conducted by municipalities. The municipalities, which carry out a large share of the public investments and can consequently generate revenues through the sale of assets, were probably the first to realize that selling off assets to cover current spending is not a sustainable policy. Such failures are always exposed by double-entry accounting. For comments on further “weaknesses” of cameralistic (single-entry) accounting see Adam (2004), p. 132.
- 90 This increase was mainly due to demographic changes, namely the inversion of the population pyramid as a result of declining birth rates and higher life expectancy. To this must be added the rising costs of health care and caring for the elderly.
- 91 For an overview with further references: Wissenschaftlicher Beirat beim BMWi (2013).
- 92 On this topic also see Lüder (2003).
- 93 Charts 15 to 17 update a corresponding analysis of the Sachverständigenrat (2011). See Werding (2014).
- 94 Blankart (2011), pp. 370-1. According to the findings of Blanchard et al. (1990).
- 95 Musgrave et al. (1989).
- 96 Ricardo (1817, chapter XVII) only considered one-time debt to cover extraordinary expenditure, such as the financing of a war. Even if it does not change the real situation of private economic actors on the whole, he rejects government debt. He prefers (just as with “normal” public expenditure) financing through taxes, as “[i]t is a system which tends to make us less thrifty – to blind us to our real situation.” (p. 163) Ricardo implies fiscal illusion. On this also see Churchman (2001), pp. 36-39.
- 97 On this topic see Buchanan’s description and critique of this “new orthodoxy”, Buchanan (1958), pp. 5-8.
- 98 Ricardo (1820, p. 187) noted that as taxpayer one can – at least to some extent – evade the burden through shifting repayment to future generations. Modigliani (1961) also pointed out this problem.
- 99 O’Driscoll (1977).

- 100 See e.g. Stanley (1998).
- 101 Modigliani (1961), p. 736, sees three possibilities to influence the output of future generations: (i) depletion of natural resources that will no longer be available at a later stage, (ii) the influence of advances in technology as well as (iii) changes in the physical capital stock. Public borrowing can also crowd out private investments when there is underemployment, which is, however, less likely.
- 102 If the interest rate is lower than the growth rate, government debt that increases the interest rate and aligns it more closely with the growth rate can also improve welfare. See Diamond (1965).
- 103 Konrad (2010), pp. 150-1, on the other hand, argues that all who call for more intergenerational justice represent the interests of the generations to come.
- 104 See Buchanan (1966).
- 105 See the example in Rosen (1999), p. 432.
- 106 Also see Brennan (2011).
- 107 Most economists agree that this is the rule and will presumably also apply to Germany in the future. Some economists, however, reject this idea.
- 108 See Blanchard (1993).
- 109 One can also argue that future generations will definitely be better off due to expected economic growth and will therefore better be able to carry the burden. (See e.g. Scherf (2009), p. 430.) But this does not change the fact that politically it is the relative income situation, not the absolute income situation that particularly matters.
- 110 Also see Andel (1969). Fehr et al. (1995) point out that the turnover tax has become less regressive.
- 111 Also see Gandenberger (1970).
- 112 Taylor (2014).
- 113 Base money, also known as the monetary base, is the money stock directly controlled by the central bank; it is therefore also referred to as central bank money. The money stock in the private sector (such as the monetary aggregate M3) can strongly differ from this (see chart 20).
- 114 Compared to the US, Great Britain and Switzerland, the increase in the euro area was rather moderate.
- 115 Cf. Leeper (2013).
- 116 Cf. Sims (2013) as well as Leeper and Zhou (2013).
- 117 Cf. e.g. Bernholz (1982) as well as Reinhart and Rogoff (2009).
- 118 Woodford (2011) and Eggertsson (2014) provide a theoretical analysis of the relevant factors. For a general overview cf. Illing and Watzka (2014).
- 119 As Auerbach and Gorodnichenko (2012) illustrate, the multiplier effects of government spending are significantly higher during recessions than during times of boom.
- 120 Cf. Farhi and Werning (2012).
- 121 Cf. Auerbach (2009).
- 122 Cf. Müller (2014).
- 123 E.g. Jayadev and Konczal (2010), Guajardo et al. (2011), Perotti (2013) or Jordà and Taylor (2013).
- 124 Heun (2014), Auerbach (2014), Burret and Feld (2014), Sutherland et al. (2005), Bohn and Inman (1996).
- 125 Von Hagen (1992) and Heun (2014).
- 126 Feld and Kirchgässner (2008), Krogstrup and Wälti (2008), Kirchgässner (2013, 2014).

Bibliography

- Adam, Berit (2004). *Internationale Rechnungslegungsstandards für die öffentliche Verwaltung (IPSAS): Eine kritische Analyse unter besonderer Berücksichtigung ihrer Anwendbarkeit in Deutschland*. Frankfurt am Main: Lang.
- Alesina, Alberto and Ardagna, Silvia (2012). "The Design of Fiscal Adjustments." *NBER Working Paper*, 18423. Online: <http://www.nber.org/papers/w18423>. Accessed on 09 May 2014.
- Alesina, Alberto and Drazen, Allan (1991). "Why are Stabilizations Delayed?" *American Economic Review*, 81, 1170-1188.
- Alesina, Alberto and Perotti, Roberto (1995). "Fiscal Expansions and Adjustments in OECD Countries." *Economic Policy*, 21, 207-248.
- Alesina, Alberto and Tabellini, Guido (1990). "A Positive Theory of Fiscal Deficits and Government Debt." *Review of Economic Studies*, 57, 403-414.
- Andel, Norbert (1969). "Zur These von den unsozialen Verteilungswirkungen öffentlicher Schulden." *Public Finance*, 24, 69-77.
- Aschauer, David A. (1989). "Is Public Expenditure Productive?" *Journal of Monetary Economics*, 23, 177-200.
- Auerbach, Alan J. (2009). "Implementing the New Fiscal Policy Activism." *American Economic Review*, 99(2), 543-549.
- Auerbach, Alan J. (2014). "Budget Rules and Fiscal Policy: Ten Lessons from Theory and Evidence." *German Economic Review*, 15(1) [Special Issue: *Government Debt in Democracies. Causes, Effects, and Limits*, C.-L. Holtfrerich (ed.)], 84-99.
- Auerbach, Alan J. and Gorodnichenko, Yuriy (2012). "Measuring the Output Responses to Fiscal Policy." *American Economic Journal: Economic Policy*, 4(2), 1-27.
- Auerbach, Alan J.; Gokhale, Jagadeesh and Kotlikoff, Laurence J. (1994). "Generational Accounting: A Meaningful Way to Evaluate Fiscal Policy." *Journal of Economic Perspectives*, 8(1), 73-94.
- Barro, Robert J. (1974). "Are Government Bonds Net Wealth?" *Journal of Political Economy*, 82, 1095-1117.
- Barro, Robert J. (1979). "On the Determination of Public Debt." *Journal of Political Economy*, 87, 940-971.
- Bernholz, Peter (1982). "Flexible Exchange Rates in Historical Perspective." *Princeton Essays in International Finance*, Princeton University.
- Black, S.W. (1992). "Seigniorage." In: Newman, Peter; Milgate, Murray and Eatwell, John (eds.). *The New Palgrave Dictionary of Money and Finance*, Vol. 3. London and Basingstoke: Macmillan Press.
- Blanchard, Olivier J. (1993). "Suggestions for a New Set of Fiscal Indicators." In: Verbon, Harrie A.A. and Van Winden, Frans (eds.). *The Political Economy of Debt*. Amsterdam: North Holland.
- Blanchard, Olivier J. and Weil, Philippe (2001). "Dynamic Efficiency, the Riskless Rate, and Debt Ponzi Games under Uncertainty." *Advances in Macroeconomics*, 1(2), Article 3.
- Blanchard, Olivier J.; Chouraqui, Jean-Claude; Hagemann, Robert P. and Sartor, Nicola (1990). "The Sustainability of Fiscal Policy: New Answers to an Old Question." *OECD Economic Studies*, 15, 7-36.
- Blankart, Charles B. (2011). *Öffentliche Finanzen in der Demokratie: Eine Einführung in die Finanzwissenschaft*. 8th edition, Munich: Vahlen.
- Bohn, Henning and Inman, Robert P. (1996). "Balanced-Budget Rules and Public Deficits: Evidence from the US States." *Carnegie Rochester Conference Series on Public Policy*, 1996, 13-76.
- Brennan, Geoffrey (2011). *The Political Economy of Public Debt*. Mimeo, Duke University.
- Buchanan, James M. (1958). *Public Principles of Public Debt: A Defense and Restatement*. Homewood: Irwin.
- Buchanan, James M. (1966). "The Icons of Public Debt." *Journal of Finance*, 21, 544-546.
- Buchanan, James M. and Wagner, Richard E. (1977). *Democracy in Deficit: The Political Legacy of Lord Keynes*. New York: Academic Press.
- Bundesminister für Arbeit und Sozialordnung (1992). *Arbeits- und Sozialstatistik: Hauptergebnisse*. Bonn.
- Bundesministerium der Finanzen (2013). *Deutsches Stabilitätsprogramm, Aktualisierung 2013*. Online: http://www.bundesfinanzministerium.de/Content/DE/Downloads/Broschueren_Bestell-service/2013-04-17-Stabilitaetsprogramm-Aktualisierung-2013.pdf?__blob=publicationFile&v=3. Accessed on 20 July 2013.
- Bundesministerium der Finanzen (2014). *Monatsberichte*. Online: www.bundesfinanzministerium.de/Web/DE/Service/Monatsbericht/monatsbericht.html. Accessed on 14 April 2014.
- Burret, Heiko T. and Feld, Lars P. (2014). "Political Institutions and Fiscal Policy: A Note on Budget Rules and Fiscal Federalism." *CESifo DICE Report – Journal for Institutional Comparisons*, 12 (1), 3-11.
- Burret, Heiko T.; Feld, Lars P. and Köhler, Ekkehard A. (2013). "Sustainability of Public Debt in Germany – Historical Considerations and Time Series Evidence." *Jahrbücher für Nationalökonomie und Statistik*, 233, 291-335.
- Burth, Andreas and Gnädinger, Marc (2015). *Haushaltsformen in Deutschland*, as per: 16 April 2013. Online: <http://www.haushaltssteuerung.de/haushaltsreform-deutschland.html>. Accessed on 5 March 2015.

- Cecchetti, Stephen Giovanni; Mohanty, Madhusudan S. and Zampolli, Fabrizio (2011). "The Real Effects of Debt." *BIS Working Paper No. 352*. Bank for International Settlements, Monetary and Economic Department. Online: <http://www.bis.org/publ/work352.pdf>. Accessed on 18 December 2013.
- Churchman, Nancy (2001). *David Ricardo on Public Debt*. Houndsmills: Palgrave.
- Coenen, Günter; Erceg, Christopher J.; Freedman, Charles; Furceri, Davide; Kumhof, Michael; Lalonde, René; Laxton, Douglas; Lindé, Jesper; Mourougane, Annabelle; Muir, Dirk; Mursula, Susanna; de Resende, Carlos; Roberts, John; Roeger, Werner; Snudden, Stephen; Trabandt, Mathias; and in't Veld, Jan (2012). "Effects of Fiscal Stimulus in Structural Models." *American Economic Journal: Macroeconomics*, 4(1), 22-68.
- Corsetti, Giancarlo et al. (2010). "Debt Consolidation and Fiscal Stabilization of Deep Recessions." *American Economic Review*, 100(2), 41-45.
- Dahrendorf, Ralf (2009). "Vom Sparkapitalismus zum Pumpkapitalismus." *Cicero Online*, 23 July 2009. Online: <http://www.cicero.de/weltb%C3%BChne/vom-sparkapitalismus-zum-pumpkapitalismus/39922>. Accessed on 26 November 2013.
- De Haan, Jakob (2014). "Democracy, Elections, and Government Budget Deficits." *German Economic Review*, 15(1) [Special Issue: *Government Debt in Democracies. Causes, Effects, and Limits*, C.-L. Holtfrerich (ed.)], 131-142.
- De Haan, Jakob and Sturm, Jan-Egbert (1997). "Political and Economic Determinants of OECD Budget Deficits and Government Expenditures: A Reinvestigation." *European Journal of Political Economy*, 13, 739-750.
- De Haan, Jakob; Sturm, Jan-Egbert and Beekhuis, Geert (1999). "The Weak Government Thesis: Some New Evidence." *Public Choice*, 101, 163-176.
- Dettweiler, Eberhard (1969). *Beiträge der deutschen Finanzwissenschaft zur Verschuldungstheorie im 19. Jahrhundert*. Dissertation, Tübingen.
- Deutsche Bundesbank (1994). *Ergebnisse der gesamtwirtschaftlichen Finanzierungsrechnung für Westdeutschland 1960 bis 1992*. Statistische Sonderveröffentlichung 4. Frankfurt am Main: Deutsche Bundesbank.
- Deutsche Bundesbank (2009). *Ergebnisse der gesamtwirtschaftlichen Finanzierungsrechnung für Deutschland 1991 bis 2008*. Statistische Sonderveröffentlichung 4. Frankfurt am Main: Deutsche Bundesbank. Online: http://www.bundesbank.de/Redaktion/DE/Downloads/Veroeffentlichungen/Statistische_Sonderveroeffentlichungen/Stato_4/stato_4_ergebnisse_der_gesamtwirtschaftlichen_finanzierungsrechnung_1991_2008.pdf?__blob=publicationFile. Accessed on 12 November 2013.
- Deutsche Bundesbank (2011). *Ergebnisse der gesamtwirtschaftlichen Finanzierungsrechnung für Deutschland 2005 bis 2010*. Statistische Sonderveröffentlichung 4. Frankfurt am Main: Deutsche Bundesbank. Online: http://www.bundesbank.de/Redaktion/DE/Downloads/Veroeffentlichungen/Statistische_Sonderveroeffentlichungen/Stato_4/stato_4_ergebnisse_der_gesamtwirtschaftlichen_finanzierungsrechnung_2005_2010.pdf?__blob=publicationFile. Accessed on 12 November 2013.
- Deutsche Bundesbank (2013). *Ergebnisse der gesamtwirtschaftlichen Finanzierungsrechnung für Deutschland 2007 bis 2012*. Statistische Sonderveröffentlichung 4. Frankfurt am Main: Deutsche Bundesbank. Online: http://www.bundesbank.de/Redaktion/DE/Downloads/Veroeffentlichungen/Statistische_Sonderveroeffentlichungen/Stato_4/stato_4_ergebnisse_der_gesamtwirtschaftlichen_finanzierungsrechnung_2007_2012.pdf?__blob=publicationFile. Accessed on 12 November 2013.
- Deutsche Bundesbank (2014a). *Ergebnisse der gesamtwirtschaftlichen Finanzierungsrechnung für Deutschland 2008 bis 2013*. Statistische Sonderveröffentlichung 4. Frankfurt am Main: Deutsche Bundesbank. Online: http://www.bundesbank.de/Redaktion/DE/Downloads/Veroeffentlichungen/Statistische_Sonderveroeffentlichungen/Stato_4/stato_4_ergebnisse_der_gesamtwirtschaftlichen_finanzierungsrechnung_2008_2013.pdf?__blob=publicationFile. Accessed on 30 January 2015.
- Deutsche Bundesbank (2014b). *Zeitreihe BKK01.PQ3008: Hypothekarkredite auf Wohngrundstücke an inländische Unternehmen und Privatpersonen / insgesamt / Alle Bankengruppen*. As of 13 February 2014. Online: http://www.bundesbank.de/Navigation/DE/Statistiken/Zeitreihen_Datenbanken/Makrooekonomische_Zeitreihen/its_details_value_node.html?tsId=BBK01.PQ3008. Accessed on 15 April 2014.
- Deutsche Bundesbank (2015). *Monthly Report*, March 2015.
- Deutsche Bundesbank (2015, 2001). *Statistische Beihefte. Beiheft 2: Kapitalmarktstatistik. Februar 2015, 2001*. Online: http://www.bundesbank.de/Navigation/DE/Veroeffentlichungen/Statistische_Beihefte/statistische_beihefte.html. Accessed on 12 March 2015. Data prior to 1985 were made available by the Bundesbank on request.
- Deutsche Bundesbank und Statistisches Bundesamt (2013). *Sektorale und gesamtwirtschaftliche Vermögensbilanz 1991-2012*. Wiesbaden: Statistisches Bundesamt. Online: https://www.destatis.de/DE/Publikationen/Thematisch/VolkswirtschaftlicheGesamtrechnungen/Vermoegensrechnung/Vermoegensbilanzen-PDF_5816103.html. Accessed on 12 March 2015.
- Deutscher Bundestag (2012). "Finanzplan des Bundes 2012-2016. Drucksache 17/10201." Online: dipbt.bundestag.de/dip21/btd/17/102/1710201.pdf. Accessed on 12 June 2013.
- Diamond, Peter A. (1965). "National Debt in a Neoclassical Growth Model." *American Economic Review*, 55, 1126-1150.
- Dickson, Peter G. (1967). *The Financial Revolution in England: A Study in the Development of Public Credit, 1688-1756*. London: Macmillan Press.
- Diemer, Rolf (1996). *Neukonzeption des kommunalen Rechnungswesens: Vergleich des betriebswirtschaftlichen Gestaltungspotentials von Doppik und Kameralistik*. Wiesbaden: Deutscher Universitätsverlag.
- Dolls, Mathias; Fuest, Clemens and Peichl, Andreas (2012). "Automatic Stabilizers and Economic Crisis: US vs. Europe." *Journal of Public Economics*, 96(3), 279-294.
- Domar, Evsey D. (1944). "The 'Burden of the Debt' and the National Income." *American Economic Review*, 34, 798-827.

- Dyson, Kenneth and Featherstone, Kevin (1999). *The Road to Maastricht: Negotiating Economic and Monetary Union*. Oxford: Oxford University Press.
- Eberlein, Marion and Klein-Hitpaß, Anne (2012). *Alten-gerechter Umbau der Infrastruktur: Investitionsbe-darf der Städte und Gemeinden*. Berlin: Deutsches Institut für Urbanistik. Online: https://www.kfw.de/Download-Center/Konzernthemen/Research/PDF-Dokumente-Studien-und-Materialien/Altengerechter-Umbau-der-Infrastruktur_Januar-2013.pdf. Accessed on 12 November 2013.
- Égert, Balázs (2012). "Public Debt, Economic Growth and Nonlinear Effects: Myth or Reality?" *OECD Economics Department Working Papers No. 993*. Online: http://www.oecd-ilibrary.org/economics/public-debt-economic-growth-and-nonlinear-effects_5k918xk-8d4zn-en. Accessed on 4 December 2013.
- Égert, Balázs (2013). "The 90% Public Debt Threshold: The Rise and Fall of a Stylised Fact." *OECD Economics Department Working Papers No. 1055*. Online: http://www.oecd-ilibrary.org/economics/the-90-public-debt-threshold_5k452kln1s6l-en. Accessed on 4 December 2013.
- Eggertsson, Gauti (2014). "Fiscal Policy, Public Debt and the World Crisis." *German Economic Review*, 15(2), 225-242.
- Eichengreen, Barry (2002). "International Financial Crisis: Is the Problem Growing?" *Jahrbuch für Wirtschaftsgeschichte*, 2002/1 (= Festschrift for C.-L. Holtfrerich. *Wirtschaftspolitik nach dem Ende der Bretton-Woods-Ära*), 89-103.
- Eucken, Walter (1964). *Grundsätze der Wirtschaftspolitik*. (First edition 1952), abridged version: 46 to 53 thousand, Reinbek bei Hamburg: Rowohlt.
- European Central Bank (monthly). *Statistics Pocket Book*. Online: <http://www.ecb.europa.eu/pub/spb/html/index.en.html>. Accessed on 4 December 2013.
- European Commission (2010-2014). Eurobarometer. Online: http://ec.europa.eu/public_opinion/archives/eb_arch_en.htm. Accessed on 5 February 2015.
- European Commission (2015). *Annual Macro-economic Database*. Online: http://ec.europa.eu/economy_finance/db_indicators/ameco/. Accessed on 9 April 2015.
- Farhi, Emmanuel and Werning, Iván (2012). "Capital Taxation: Quantitative Explorations of the Inverse Euler Equation." *Journal of Political Economy*, 120, 398-445.
- Federal [Swiss] Finance Administration (2015). *Finanzstatistik*. Online: <http://www.efv.admin.ch/dokumentation/finanzstatistik/index.php>. Accessed on 9 April 2015.
- Federal Reserve Bank of St. Louis (2013). *FRED Economic Data: Gross Federal Debt as Percent of Gross Domestic Product*. As of 2 August 2013. Online: <http://research.stlouisfed.org/fred2/series/GFDGDP-A188S?cid=5>. Accessed on 14 August 2013.
- Fehr, Hans; Rosenberg, Christoph B. and Wiegard, Wolfgang (1995). *Welfare Effects of Value-Added Tax Harmonization in Europe: A Computable General Equilibrium Analysis*. Berlin: Springer.
- Feld, Lars P. and Kirchgässner, Gebhard (2008). "On the Effectiveness of Debt Brakes: The Swiss Experience." In: Neck, Reinhard and Sturm, Jan-Egbert (eds.), *Sustainability of Public Debt*, Cambridge, MA: MIT Press, 223-255.
- Feldstein, Martin (1977). "The Surprising Incidence of a Tax on Pure Rent: A New Answer to an Old Question." *Journal of Political Economy*, 85, 349-360.
- Fincke, Bettina and Greiner, Alfred (2011). "Do Large Industrialized Economies Pursue Sustainable Debt Policies? A Comparative Study for Japan, Germany and the United States." *Japan and the World Economy*, 23, 203-213.
- Frey, Bruno S. (1970). "Optimales Wachstum: Übersicht und Kritik." *Jahrbücher für Nationalökonomie und Statistik*, 184, 9-30.
- Gandenberger, Otto (1970). "Öffentlicher Kredit und Einkommensverteilung." *Finanzarchiv*, 29, 1-16.
- Gandenberger, Otto (1980). "Öffentliche Verschuldung II. Theoretische Grundlagen." In: Albers, Willi et al. (eds.), *Handwörterbuch der Wirtschaftswissenschaft*, Stuttgart: G. Fischer, 480-504.
- Gelderblom, Oscar and Jonker, Joost (2011). "Public Finance and Economic Growth: The Case of Holland in the Seventeenth Century." *Journal of Economic History*, 71, 1-39.
- Greiner, Alfred; Köller, Uwe and Semmler, Willi (2006). "Testing the Sustainability of German Fiscal Policy: Evidence for the Period 1960-2003." *Empirica*, 33, 127-140.
- Guajardo, Jaime; Leigh, Daniel and Pescatori, Andrea (2011). "Expansionary Austerity: New International Evidence." *IMF Working Paper WP/11/158*. Online: <http://www.imf.org/external/pubs/ft/wp/2011/wp11158.pdf>. Accessed on 4 December 2013.
- Hagen, Jürgen von (1992). "Budgeting Procedures and Fiscal Performance in the European Communities." *Economic Papers*, 96, 1-79.
- Hallerberg, Mark; Strauch, Rolf R. and Hagen, Jürgen von (2009). *Fiscal Governance in Europe*. Cambridge: Cambridge University Press.
- Hart, Marjolein 't (1997). "The Merits of a Financial Revolution: Public Finance, 1550-1700." In: Hart, Marjolein 't; Jonker, Joost and van Zanden, Luiten (eds.). *A Financial History of the Netherlands*. Cambridge: Cambridge University Press, 11-36.
- Hayek, Friedrich A. von (1930). "Gibt es einen ‚Widersinn des Sparens?'" *Zeitschrift für Nationalökonomie*, 1(3), 387-429.
- Herndon, Thomas; Ash, Michael and Pollin, Robert (2013). "Does High Public Debt Consistently Stifle Economic Growth? A Critique of Reinhart and Rogoff." *Political Economy Research Institute Working Paper No. 322*. Online: <http://www.handelszeitung.ch/sites/handelszeitung.ch/files/article/documents/wp322.pdf>. Accessed on 4 December 2013.
- Heun, Werner (2014). "Balanced Budget Requirements and Debt Brakes. Feasibility and Enforcement." *German Economic Review*, 15(1) [Special Issue: *Government Debt in Democracies. Causes, Effects, and Limits*, C.-L. Holtfrerich (ed.)], 100-115.
- Holtfrerich, Carl-Ludwig (2013). "Government Debt in Economic Thought of the Long 19th Century." *Freie Universität Berlin / School of Business & Economics, Discussion Paper 2013/4: Economics*. Online: http://edocs.fu-berlin.de/docs/servlets/MCRFileNodeServlet/FUDOCs_derivate_00000002511/discpaper4_2013.pdf. Accessed on 4 December 2013.

- Holtfrerich, Carl-Ludwig (2014). "Public Debt in Post-1850 German Economic Thought vis-à-vis the Pre-1850 British Classical School." *German Economic Review*, 15(1) [Special Issue: *Government Debt in Democracies. Causes, Effects, and Limits*, C.-L. Holtfrerich (ed.)], 62-83.
- Homburg, Stefan (1991). "Interest and Growth in an Economy with Land." *Canadian Journal of Economics / Revue canadienne d'Economie*, 24(2), 450-459.
- Homburg, Stefan (2014). "Overaccumulation, Public Debt, and the Importance of Land." *Discussion Paper No. 525*, Institute of Public Economics, Leibniz University of Hannover. Online: http://diskussionspapiere.wiwi.uni-hannover.de/pdf_bib/dp-525.pdf. Accessed on 29 April 2014.
- Illing, Gerhard and Watzka, Sebastian (2014): "Fiscal Multipliers and Their Relevance in a Currency Union: A Survey." *German Economic Review*, 15(2), 259-271.
- James, Harold (2012). *Making the European Monetary Union*. Cambridge: Harvard University Press.
- Jayadev, Arjun and Konczal, Mike (2010). *The Boom Not the Slump: The Right Time for Austerity*. The Roosevelt Institute. Online: http://www.rooseveltinstitute.org/sites/all/files/not_the_time_for_austerity.pdf. Accessed on 4 December 2013.
- Jordà, Òscar and Taylor, Alan M. (2013): "The Time for Austerity: Estimating the Average Treatment Effect of Fiscal Policy." *NBER Working Paper 19414*. Online: <http://www.nber.org/papers/w19414>. Accessed on 18 December 2013.
- Jordà, Òscar; Schularick, Moritz and Taylor, Alan M. (2013a). "Sovereigns versus Banks: Credit, Crises, and Consequences." *NBER Working Paper*, 19506. Online: <http://www.nber.org/papers/w19506>. Accessed on 18 December 2013.
- Jordà, Òscar; Schularick, Moritz and Taylor, Alan M. (2013b). "When Credit Bites Back." *Journal of Money, Credit and Banking*, 45, 3-28.
- Kantzenbach, Erhard (ed.) (1996). *Staatsüberschuldung*. Lectures held at the symposium of the Joachim Jungius-Gesellschaft der Wissenschaften, Hamburg on 9 and 10 February 1996. Göttingen: Vandenhoeck & Rupprecht.
- Kastrop, Christian; Meister-Scheufelen, Gisela and Sudhof, Margaretha (eds.) (2010). *Die neuen Schuldenregeln im Grundgesetz*. Berlin: Berliner Wissenschaftsverlag.
- Keynes, John M. (1924). "Inflation as a Method of Taxation." In Keynes, John M. (1924). *A Tract on Monetary Reform*. 41-63.
- KfW (2013). *KfW-Kommunalpanel 2012*. Frankfurt am Main: KfW. Online: <https://www.kfw.de/PDF/Download-Center/Konzernthemen/Research/PDF-Dokumente-KfW-Kommunalpanel/KfW-Kommunalpanel-2012-LF.pdf>. Accessed on 6 November 2013.
- Kirchgässner, Gebhard (2005). "Sustainable Fiscal Policy in a Federal State: The Swiss Example." *Swiss Political Science Review*, 11 (Special Issue), 19-46.
- Kirchgässner, Gebhard (2013). "Fiscal Institutions at the Cantonal Level in Switzerland." *Schweizerische Zeitschrift für Volkswirtschaft und Statistik*, 149, 139-166.
- Kirchgässner, Gebhard (2014). "On the Political Economy of Public Deficits and Debt." *German Economic Review*, 15(1) [Special Issue: *Government Debt in Democracies. Causes, Effects, and Limits*, C.-L. Holtfrerich (ed.)], 116-130.
- Kirschen, Étienne S. (1964). *Economic Policy in Our Time. Vol I. General Theory*. Amsterdam: North Holland.
- Konrad, Kai (2010). "Fiskalregeln und Zeitkonsistenz." In: Kastrop et al. (eds.), 153-154. (see Kastrop)
- Konrad, Kai A. and Zschäpitz, Holger (2010). *Schulden ohne Sühne? Warum der Absturz der Staatsfinanzen uns alle trifft*. Munich: C.H. Beck. Revised and updated edition: Konrad, Kai A. and Zschäpitz, Holger (2012). *Schulden ohne Sühne? Was Europas Krise uns Bürger kostet*. Munich: dtv.
- Krogstrup, Signe and Wälti, Sébastien (2008). "Do Fiscal Rules Cause Budgetary Outcomes?" *Public Choice*, 136(1-2), 123-138.
- Laeven, Luc and Valencia, Fabian (2012). "Systemic Banking Crises." *IMF Working Paper 12/163*. Online: <http://www.imf.org/external/pubs/ft/wp/2012/wp12163.pdf>. Accessed on 18 December 2013.
- Leeper, Eric M. (2013). *Fiscal Limits and Monetary Policy*. Mimeo, Indiana University.
- Leeper, Eric M. and Zhou, Xuan (2013). "Inflation's Role in Optimal Monetary-Fiscal Policy." *NBER Working Paper No. 19686*, November 2013. Online: <http://www.nber.org/papers/w19686.pdf>. Accessed on 22 April 2014.
- Lerner, Abba P. (1948). "The Burden of the National Debt." In: Metzler, Lloyd A. (ed.). *Income, Employment and Public Policy: Essays in Honor of Alwin H. Hansen*. New York: Norton. 255-275.
- Lindholm, Richard W. (1950). *Public Finance and Fiscal Policy: An Analysis of Government Spending, Revenue, and Debt*. New York: Pitman.
- Lüder, Klaus (2003). *Vom Ende der Kameralistik*. Speyerer Vorträge Heft 74.
- Modigliani, Franco (1961). "Long-Run Implications of Alternative Fiscal Policies and the Burden of the National Debt." *The Economic Journal*, 71, 730-755.
- Müller, Gernot J. (2014). "Fiscal Austerity and the Multiplier in Times of Crisis." *German Economic Review*, 15(2), 243-258.
- Musgrave, Richard A. and Musgrave, Peggy B. (1989). *Public Finance in Theory and Practice*. 5th revised edition. New York: McGraw-Hill.
- Niskanen, William A. (1968). "Nonmarket Decision Making: The Peculiar Economies of Bureaucracy." *American Economic Review*, 58, 293-305.
- Niskanen, William A. (1971). *Bureaucracy and Representative Government*. Chicago: Aldine Atherton.
- Nordhaus, William D. (1975). "The Political Business Cycle." *Review of Economic Studies*, 42(2), 169-190.
- O'Driscoll, Gerald P. (1977). "The Ricardian Nonequivalence Theorem." *Journal of Political Economy*, 85(1), 207-210.
- Panizza, Ugo and Presbitero, Andrea F. (2013). "Public Debt and Economic Growth in Advanced Economies: A Survey." *Swiss Journal of Economics and Statistics*, 175-204.
- Perotti, Roberto (2013). "The 'Austerity Myth': Gain without Pain?" In: Alesina, Alberto and Giavazzi, Francesco (eds.). *Fiscal Policy after the Financial Crisis*. Chicago: University of Chicago Press, 307-354.
- Perotti, Roberto and Kontopoulos, Yianos (2002). "Fragmented Fiscal Policy." *Journal of Public Economics*, 86, 191-222.

- Persson, Torsten and Svensson, Lars E. (1989). "Why a Stubborn Conservative Would Run a Deficit: Policy with Time-Inconsistent Preferences." *Quarterly Journal of Economics*, 104(2), 325-345.
- Persson, Torsten and Tabellini, Guido (2003). *The Economic Effects of Constitutions*. Cambridge: MIT Press.
- Petersen, Thieß; Böhmer, Michael and Weisser, Johannes (2012). "Maastricht 2.0 – Vorschlag für eine neue Verschuldungsregel." Bertelsmann-Stiftung, *Zukunft soziale Marktwirtschaft*, Policy Brief, 2012/5, Online: http://www.bertelsmann-stiftung.de/bst/de/media/xcms_bst_dms_36387_36388_2.pdf, Accessed on 21 August 2013.
- Pettersson-Lidbom, Per (2001). "An Empirical Investigation of the Strategic Use of Debt." *Journal of Political Economy*, 109(3), 570-583.
- Phelps, Edmund (1961). "The Golden Rule of Accumulation: A Fable for Growthmen." *American Economic Review*, 51, 638-643.
- Ramey, Valerie A. (2011). "Can Government Purchases Stimulate the Economy?" *Journal of Economic Literature*, 49(3), 673-685.
- Raupach, Björn and Stangenberg, Katrin (2009). *Doppik in der öffentlichen Verwaltung: Grundlagen, Verfahrensweisen, Einsatzgebiete*. 2nd edition, Wiesbaden: Gabler.
- Reinhart, Carmen M. and Rogoff, Kenneth S. (2009). *This Time Is Different. Eight Centuries of Financial Folly*. Princeton: Princeton University Press.
- Reinhart, Carmen M. and Rogoff, Kenneth S. (2010). "Growth in a Time of Debt." *American Economic Review*, 100(2), 573-578.
- Ricardo, David (1817). *The Principles of Political Economy and Taxation*. Reprint: London: Dent.
- Ricardo, David (1820). "Funding System." In: Piero Sraffa (ed.). *David Ricardo, The Works and Correspondence of David Ricardo, Vol. 4 Pamphlets and Papers 1815-1823 [1815]*. Cambridge: Cambridge University Press, 1951.
- Romp, Ward and De Haan, Jakob (2007). "Public Capital and Economic Growth: A Critical Survey." *Perspektiven der Wirtschaftspolitik*, 8, special issue, 6-52.
- Rosen, Harvey S. (1999). *Public Finance*. 5th edition. Boston: Irwin/McGraw-Hill.
- Roubini, Nouriel and Sachs, Jeffrey (1989). "Political and Economic Determinants of Budget Deficits in the Industrial Democracies." *European Economic Review*, 33, 903-933.
- Sachverständigenrat zur Begutachtung der gesamtwirtschaftlichen Entwicklung (1969). *Jahresgutachten 1969/70: Im Sog des Booms*. Stuttgart: Kohlhammer. Online: http://www.sachverstaendigenrat-wirtschaft.de/fileadmin/dateiablage/download/gutachten/jg69_70.pdf. Accessed on 3 December 2013.
- Sachverständigenrat zur Begutachtung der gesamtwirtschaftlichen Entwicklung (1979). *Jahresgutachten 1979/80: Herausforderung von außen*. Bundestags-Drucksache 8/3420. Online: <http://www.sachverstaendigenrat-wirtschaft.de/fileadmin/dateiablage/download/gutachten/o803420.pdf>. Accessed on 3 December 2013.
- Sachverständigenrat zur Begutachtung der gesamtwirtschaftlichen Entwicklung (1994). *Jahresgutachten 1994/95: Den Aufschwung sichern – Arbeitsplätze schaffen*. Bundestags-Drucksache 13/26. Online: <http://www.sachverstaendigenrat-wirtschaft.de/fileadmin/dateiablage/download/gutachten/1300026.pdf>. Accessed on 3 December 2013.
- Sachverständigenrat zur Begutachtung der gesamtwirtschaftlichen Entwicklung (2002). *Jahresgutachten 2002/03: Zwanzig Punkte für Beschäftigung und Wachstum*. Stuttgart: Metzler-Poeschel. Online: http://www.sachverstaendigenrat-wirtschaft.de/fileadmin/dateiablage/download/gutachten/o2_ges.pdf. Accessed on 3 December 2013.
- Sachverständigenrat zur Begutachtung der gesamtwirtschaftlichen Entwicklung (2004). *Jahresgutachten 2004/05: Erfolge im Ausland – Herausforderungen im Inland*. Online: http://www.sachverstaendigenrat-wirtschaft.de/fileadmin/dateiablage/download/gutachten/o4_gesa.pdf. Accessed on 3 December 2013.
- Sachverständigenrat zur Begutachtung der gesamtwirtschaftlichen Entwicklung (2007). *Staatsverschuldung wirksam begrenzen*. Expertise im Auftrag des Bundesministers für Wirtschaft und Technologie, Wiesbaden, March 2007. Online: http://www.sachverstaendigenrat-wirtschaft.de/fileadmin/dateiablage/Expertisen/Staatsverschuldung_wirksam_begrenzen.pdf. Accessed on 18 December 2013.
- Sachverständigenrat zur Begutachtung der gesamtwirtschaftlichen Entwicklung (2011). *Herausforderungen des demografischen Wandels*. Expertise im Auftrag der Bundesregierung. Wiesbaden, May 2011. Online: http://www.sachverstaendigenrat-wirtschaft.de/fileadmin/dateiablage/Expertisen/2011/expertise_2011-demografischer-wandel.pdf. Accessed on 18 December 2013.
- Sachverständigenrat zur Begutachtung der gesamtwirtschaftlichen Entwicklung (2015). *Zeitreihen für Deutschland. Verwendung des Volkseinkommens*. Online: http://www.sachverstaendigenrat-wirtschaft.de/zr_deutschland.html. Accessed on 03 February 2015.
- Sargent, Thomas and Wallace, Neill (1981). "Some Unpleasant Monetarist Arithmetic." *Federal Reserve Bank of Minneapolis, Quarterly Review*, 531.
- Schaltegger, Christoph A. and Feld, Lars P. (2009). "Do Large Cabinets Favor Large Governments? Evidence on the Fiscal Commons Problem for Swiss Cantons." *Journal of Public Economics*, 93, 35-47.
- Scherf, Wolfgang (2009). *Öffentliche Finanzen: Einführung in die Finanzwissenschaft*. Stuttgart: Lucius and Lucius.
- Schick, Allen (1993). "Governments versus Budget Deficits." In: Weaver, Kent R. and Rockman, Bert A. (eds.). *Do Institutions Matter? Government Capabilities in the United States and Abroad*. Washington, DC: Brookings Institution, 187-236.
- Schlesinger, Helmut; Weber, Manfred and Ziebarth, Gerhard (1993). *Staatsverschuldung ohne Ende? Zur Rationalität und Problematik des öffentlichen Kredits*. Darmstadt: Wissenschaftliche Buchgesellschaft.
- Schularick, Moritz (2012). "Public Debt and Financial Crises in the Twentieth Century." *European Review of History*, 19(6), 881-897.

- Schularick, Moritz and Taylor, Alan M. (2012). "Credit Booms Gone Bust: Monetary Policy, Leverage Cycles, and Financial Crises." *American Economic Review*, 102(2), 1029-1061.
- Sims, Christopher (2013). "Paper Money." *American Economic Review*, 103(2), 563-584.
- Spilimbergo, Antonio; Symansky, Steve and Schindler, Marton (2009). "Fiscal Multipliers." *IMF Staff Position Notes No. 09/11*. Washington, DC: IMF.
- Stanley, Tom D. (1998). "New Wine in Old Bottles: A Meta-Analysis of Ricardian Equivalence." *Southern Economic Journal*, 64, 713-727.
- Statistisches Bundesamt (1972). *Bevölkerung und Wirtschaft 1872-1972*. Stuttgart: Kohlhammer.
- Statistisches Bundesamt (2014). *VGR des Bundes: Ausgaben des Staates*. GENESIS-Onlinedatenbank. Accessed on 13 March 2014.
- Statistisches Bundesamt (2015a). *Lange Reihen: Registrierte Arbeitslose, Arbeitslosenquote nach Gebietsstand*. Online: <https://www.destatis.de/DE/ZahlenFakten/Indikatoren/LangeReihen/Arbeitsmarkt/lrarbo03.html>. Accessed on 15 January 2015.
- Statistisches Bundesamt (2015b). *Schulden des öffentlichen Gesamthaushalts beim nicht-öffentlichen Bereich insgesamt*. Online: https://www.destatis.de/DE/ZahlenFakten/GesellschaftStaat/OeffentlicheFinanzenSteuern/OeffentlicheFinanzen/Schulden/Tabellen/SchuldenNichtOeffentlich_Insgesamt.html. Accessed on 22 January 2015.
- Statistisches Bundesamt (2015c). *Verwendung des Bruttoinlandsprodukts Deutschland. In jeweiligen Preisen, Veränderungsraten zum Vorjahr in %*. Online: <https://www.destatis.de/DE/ZahlenFakten/Indikatoren/LangeReihen/VolkswirtschaftlicheGesamtrechnungen/lrvgr02.html>. Accessed on 30 January 2015.
- Statistisches Bundesamt (2015d). *VGR des Bundes – Bruttonationaleinkommen, Volkseinkommen: Deutschland, Jahre*. GENESIS-Onlinedatenbank. Accessed on 22 January 2015.
- Statistisches Bundesamt (2015e). *VGR des Bundes – Einnahmen und Ausgaben des Staates: Deutschland, Jahre, Staatliche Teilsektoren, Einnahme- und Ausgabearten*. GENESIS-Onlinedatenbank. Accessed on 03 February 2015.
- Statistisches Bundesamt (2015f). *VGR des Bundes – Verwendung des BIP (nominal/preisbereinigt): Deutschland, Jahre*. GENESIS-Onlinedatenbank. Accessed on 22 January 2015.
- Statistisches Bundesamt (2015g). *Volkswirtschaftliche Gesamtrechnungen. Bruttoinlandsprodukt, Bruttonationaleinkommen, Volkseinkommen. Lange Reihen ab 1925*. Online: <https://www.destatis.de/DE/ZahlenFakten/GesamtwirtschaftUmwelt/VGR/VolkswirtschaftlicheGesamtrechnungen.html>. Accessed on 22 January 2015.
- Stein, Lorenz von (1871). *Lehrbuch der Finanzwissenschaft*. 2nd edition. Leipzig: Brockhaus.
- Steinmo, Sven (1995). "Why is Government So Small in America?" *Governance*, 8, 303-334.
- Streeck, Wolfgang and Mertens, Daniel (2011). "Fiscal Austerity and Public Investment. Is the Possible the Enemy of the Necessary?" *MPIfG Discussion Paper 2011/12*. Online: http://papers.ssrn.com/sol3/papers.cfm?abstract_id=1894657. Accessed on 10 July 2013.
- Sturm, Jan-Egbert; Kuper, Gerard H. and Haan, Jakob de (1996). "Modelling Government Investment and Economic Growth on a Macro Level: A Review." Online Sept. 1996: http://papers.ssrn.com/sol3/papers.cfm?abstract_id=3510. Accessed on 11 July 2013. Printed in: Brakman, Steven; Van Ees, Hans and Kuipers, Simon K. (eds.)(1998). *Market Behaviour and Macroeconomic Modelling*. Basingstoke: Macmillan.
- Sturm, Roland (1999). *Ergänzung der statistischen Berichterstattung über öffentliche Finanzen bei zunehmender Anwendung kaufmännischer Rechnungssysteme*. Stuttgart: Metzler-Poeschel.
- Sutherland, Douglas; Price, Robert and Joumard, Isabelle (2005). *Fiscal Rules for Sub-central Governments: Design and Impact*. Paris: OECD. Online: http://www.oecd-ilibrary.org/economics/fiscal-rules-for-sub-central-governments_606015633336. Accessed on 27 November 2013.
- Taylor, Frederick (2014). *The Downfall of Money. Germany's Hyperinflation and the Destruction of the Middle Class*. London: Bloomsbury Paperbacks.
- Tufte, Edward R. (1978). *Political Control of the Economy*. Princeton: Princeton University Press.
- Wagner, Adolph (1863). *Die Ordnung des österreichischen Staatshaushaltes mit besonderer Rücksicht auf den Ausgabe-Etat und die Staatsschuld*. Vienna: Gerold.
- Wagschal, Uwe (1996). *Staatsverschuldung. Ursachen im internationalen Vergleich*. Opladen: Leske + Budrich.
- Wagschal, Uwe (1998). "Politische und Institutionelle Determinanten der Staatsverschuldung." *Zeitschrift für Wirtschaftspolitik*, 47, 220-243.
- Weizsäcker, Carl Christian von (1962). *Wachstum, Zins und optimale Investitionsquote*. Tübingen: Mohr Siebeck.
- Weizsäcker, Carl Christian von (2014). "Public Debt and Price Stability." *German Economic Review*, 15(1) [Special Issue: *Government Debt in Democracies. Causes, Effects, and Limits*, C.-L. Holtfrerich (ed.)], 42-61.
- Werding, Martin (2014). "Demographischer Wandel und öffentliche Finanzen. Langfrist-Projektion 2014-2060 unter besonderer Berücksichtigung des Rentenreform-Pakets der Bundesregierung". Arbeitspapier 01/2014. Wiesbaden: Sachverständigenrat zur Begutachtung der gesamtwirtschaftlichen Entwicklung.
- Wissenschaftlicher Beirat beim Bundesministerium der Finanzen (2007). "Schuldenbremse für Bund und Länder – Für eine Neufassung der Verschuldungsgrenzen." Letter to Federal Minister of Finance Peer Steinbrück of 10 February 2007. Published on the BMF website on 11 July 2007.
- Wissenschaftlicher Beirat beim Bundesministerium der Finanzen (2008). "Besteht in Deutschland weiterer fiskalpolitischer Handlungsbedarf zur Stabilisierung der Konjunktur?" Letter to the Federal Minister of Finance Peer Steinbrück on 4 December 2008. Published on the BMF website on 12 January 2009 and in: *Monatsbericht des BMF*, February 2009, 63-68.
- Wissenschaftlicher Beirat beim Bundesministerium für Wirtschaft und Energie (2013). *Evaluierung wirtschaftspolitischer Fördermaßnahmen als Element einer evidenzbasierten Wirtschaftspolitik*. Online: <http://www.bmwi.de/DE/Mediathek/publikationen,-did=600674.html>. Accessed on 8 April 2014.

- Wissenschaftlicher Beirat beim Bundesministerium für
Wirtschaft und Technologie (2008). *Zur Begrenzung
der Staatsverschuldung nach Art. 115 GG und zur
Aufgabe des Stabilitäts- und Wachstumsgesetzes.*
Gutachten 01/08. Online: [http://www.bmwi.de/
BMWi/Redaktion/PDF/Publikationen/gutachten-wis-
senschaftlicher-beirat-begrenzung-der-staatsver-
schuldung-nach-art-115-gg,property=pdf,bereich=b-
mwi2012,sprache=de,rwb=true.pdf](http://www.bmwi.de/BMWi/Redaktion/PDF/Publikationen/gutachten-wissenschaftlicher-beirat-begrenzung-der-staatsverschuldung-nach-art-115-gg,property=pdf,bereich=bmwi2012,sprache=de,rwb=true.pdf). Accessed on 3
November 2013.
- Woodford, Michael (2011). "Simple Analytics of the Gov-
ernment Expenditure Multiplier." *American Economic
Journal: Macroeconomics*, 3(1), 1-35.
- Ziffzer, Stefan (1980). *Ökonomische Grenzen der staatli-
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