Sebastian Dullien

A New »Magic Square« for Inclusive and Sustainable Economic Growth

A policy framework for Germany to move beyond GDP

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FOREWORD

Increasing the prosperity of society as a whole is the ultimate aim of all economic policy. For a long time gross domestic product (GDP) held centre stage as the key measure of prosperity. For some time now, however, it has been becoming increasingly clear in politics, economics and civil society that GDP is not a good indicator of prosperity and that alternative variables and measuring procedures are urgently needed. One might mention, for example, the results of the Stiglitz-Sen-Fitoussi Commission in France or of the Bundestag commission of inquiry into growth, prosperity and quality of life. They reached the conclusion that the focus on a purely material notion of prosperity does not go far enough and an economic policy that is oriented only on GDP growth falls short of society's main challenges.

The Friedrich-Ebert-Stiftung, too, together with Denkwerk Demokratie and other experts has, within the framework of several workshops, intensively addressed the issue of how overall economic prosperity can be better measured and how economic policy can be more effectively oriented towards the goal of sustainable development of prosperity. The point of departure of these reflections was the so-called »magic square«, which was legally anchored in Germany within the framework of the Stability and Growth Law of 1967. Economic policy action was supposed to be oriented towards four important goals, on an equal footing: adequate and constant economic growth, a high level of employment, price stability and external economic balance. Today, looking back over around 50 years after the coming into force of the Stability and Growth Law, it is clear that the idea has not been put into political practice.

The aim of the new »magic square« is to avoid the mistakes and shortcomings of the old »magic square«. At the centre stand a much broader notion of prosperity than hitherto that explicitly takes into consideration economic, social, environmental and fiscal sustainability, as well as a strict and clearly defined set of indicators that operationalise the four sustainability dimensions more precisely. The basic idea of the concept is to make it mandatory for every new federal government, on the basis of a reformed Stability and Growth Law, to achieve target values for the four sustainability dimensions, which they would have to lay down at the outset of each legislative period, and to oblige them to report on the achievement of objectives, target conflicts and failures to meet targets in a transparent manner.

The comprehensive work on the new »magic square« is already reflected in a series of publications by the Friedrich-Ebert-Stiftung and Denkwerk Demokratie. The findings of these studies suggest that the proposed set of indicators represents a solid basis for describing and assessing prosperity trends across society as a whole in Germany. Furthermore, it can also facilitate practical political implementation of the objective of basing economic policy more transparently and effectively on the dimensions of economic, social, ecological and fiscal sustainability – and as such on a more broadly defined concept of well-being. The present study by Professor Sebastian Dullien is intended to further refine the set of indicators for the dimension of environmental sustainability and to expand the analysis of the development of the prosperity of society as a whole in Germany in the period 2009 – 2015. The present study thus reflects current work on the new »magic square«.

A further objective is to measure the prosperity of society as a whole in Germany in the coming years on the basis of this concept and thus to give substantial impetus to a better economic policy, oriented towards a much broader concept of prosperity than in the past. We also hope that in the not too distant future the new »magic square« – building on the previous Stability and Growth Law – will be implemented in political practice in the form of a new Stability and Prosperity Law.

We hope that readers will find this study interesting and informative.

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SUMMARY

This study presents a new approach recently discussed in Germany to introduce broader measures of well-being beyond the Gross Domestic Product into the economic policy-making process and demonstrates how this policy framework could have been applied to German data for the years 2009 to 2015. According to this approach, the German Stability and Growth Law of 1967 and its »magic square« would be reformed and expanded to cover goals of social cohesion and environmental sustainability in addition to goals of economic stability and income growth.

In a number of workshops organised by the Friedrich-Ebert-Stiftung and the Denkwerk Demokratie, the overall concept was evaluated positively and expanded by proposals for improvements on matters of detail. This study also discusses these improvements.

Dullien's (2015) original proposal foresees monitoring the progress and sustainability of Germany's economy on the basis of thirteen individual indicators in the four dimensions »material prosperity and economic sustainability«, »sustainability of public sector activities and public finances, »social sustainability« and »environmental sustainability«. After taking office, each new federal government would be obliged by the reformed Stability and Growth Law to present trajectories it aims to achieve over its term in office. The achievement of these goals would be monitored by a reformed Council of Economic Experts and the government would be required to react to deviation of actual developments from their target ranges.

With the slightly modified set of indicators and the new data it turns out that although material prosperity in Germany improved acceptably in the period 2009 – 2015, in the area of environmental sustainability the goals were largely not achieved and in addition there were growing problems with regard to social sustainability. As far as the sustainability of public sector activities and public finances are concerned the picture is mixed because robust government budgets and falling public debt must be set against a continuing fall in the public capital stock as a result of low net public investment.

Overall, it is shown that the new framework presented would be a welcome addition to monitor economic progress and help to make achievements of economic policy in increasing broad-based well-being more transparent.

1

INTRODUCTION

Gross Domestic Products (GDP) remains a central variable in the public discourse on the success or failure of economic policy. At the same time, among economists, it is by now widely acknowledged that GDP is a highly imperfect measure of well-being of the citizens of a country. While some distortions have been discussed for a long time even in undergraduate economic text-books (such as the oddity that natural catastrophes tend to cause GDP to increase), the past decade or so has seen a resurgence in the discussion of alternative concepts to measure economic well-being.

A number of governments, including the French and British, have thus asked experts to look into alternative ways of gauging economic progress, and in some instances, these debates have actually informed economic policy making. The Europe 2020 framework, for example, contains not only traditional economic indicators such as GDP growth, but also indicators for social exclusion and environmental degradation.

This debate has also been picked up in Germany. In 2010, the Bundestag tasked an official commission of inquiry with looking into ways to appropriately measure and monitor well-being in a modern society. They came up with an elaborate and in-depth report on welfare measurement, but no visible policy conclusions were drawn from that work.

Debates among the political left have moved even further. One widely discussed idea is to insert a more comprehensive vision of welfare into existing German economic policy procedures and institutions, namely amending the Stability and Growth Law (SGL) of 1967 with goals of social cohesion and environmental sustainability. One rationale for this approach is that the Stability and Growth Law with its acclaimed »magic square« of economic policy objectives is highly regarded in Germany and is widely known as it is usually covered in high school curricula.

The debate on the reform of the Stability and Growth Law was launched by a series of studies on the issue published by the Friedrich-Ebert-Stiftung and Denkwerk Demokratie (Dullien/van Treeck 2012; Denkwerk Demokratie 2013; Klär et al. 2013). Partly in response to these studies Bündnis 90/Die Grünen and the SPD included calls for reform of the existing Stability and Growth Law in their manifestos for the 2013 Bundestag election (Bündnis 90/Die Grünen 2013: 70; SPD 2013: 14). The Grand Coalition included it as a matter for study in its coalition agreement 2013 (CDU/CSU und SPD 2013: 14).

The development of the framework was conducted not only in the abovementioned publications, but also in a series of workshops. In summer 2015 the Federal Ministry for Economic Affairs and Energy (BMWi) organised a workshop on fundamental issues concerning the need to reform the Stability and Growth Law involving representatives of the Council of Economic Experts, the Ministry for Economic Affairs and Energy, the Ministry of Finance and the Chancellor's Office (BMWi 2015), although unfortunately without including representatives from those advocating reform. The Friedrich-Ebert-Stiftung and Denkwerk Demokratie organised a series of workshops in which various stakeholders were able to discuss the details of the proposals for reforming the »magic square«.

This paper is intended to summarise this debate for an international audience and show how the framework could have been applied to the German case for the years 2009 to 2015. While some of the institutional details are specifically German, the broader approach can be applied in other countries as well. In fact, such an application of similar approaches in other countries would be very helpful to actually achieve the policy goal of socially inclusive and environmentally sustainable economic growth: Many of the elements of such a broad economic development cannot be controlled by one nation state alone, but ideally require European cooperation. Such a cooperation could be more easily achieved if different EU countries operated under a similar framework. As a vision for the distant future, one could even imagine establishing such a new »magic square« at the European level.

This paper is structured as follows: Section 2 gives a very brief summary of the national and international discussion on moving beyond GDP as the primary indicator for welfare and economic progress. Section 3 explains the history and relevance of the Stability and Growth Law for economic

policy-making and the economic policy debate in Germany. Section 4 outlines the basic idea of the new »magic square«. In Section 5 the current debate and controversies about the new »magic square« are presented and discussed. In Section 6 the indicators and trajectories of the updated new »magic square« are presented in brief. In Section 7 the updated »magic square« is used to evaluate changes in prosperity in recent years, with a particular focus on the years 2014 – 2016 that were not analysed in Dullien (2015).[1] Section 8 concludes.

1 More specifically, the study focuses mainly on the data until 2015. At the time this study was produced at the beginning of 2017, only rough estimates – if at all – were available for most 2016 data, so that assessment of 2016 is fraught with uncertainty.

2

BEYOND GDP: THE DEBATE

Before alternative measures for economic well-being and progress can be included into a policy framework, it is necessary to decide which measures to actually include. A number of studies have been conducted on the question how to comprehensively measure well-being. Since the second half of the first decade of the 2000s onwards, research on this issue has proliferated, mainly triggered by the experience of a period of economic growth in developed economies during which a large part of the population did not perceive an increase in its quality of life.

One of the first high-profile reports on the issue was commissioned in 2008 by the French president of that time, Nicolas Sarkozy, and put together by the Commission on the Measurement of Economic Performance and Social Progress, headed by Joseph Stiglitz, Amartya Sen and Jean-Paul-Fitoussi (commonly refered to as the Stiglitz-Sen-Fitoussi Commission, SSFC). Building on this work, the German Council of Economic Experts (Sachverständigenrat) and the French Council of Economic Analysis (Conseil d'Analyse Economique) published a joint report in 2009.

At the same time, a number of international organisations have tried to incorporate these lessons into their work. In 2007, the European Commission, the European Parliament and the Organisation for Economic Cooperation and Development (OECD) hosted a conference jointly with the Club of Rome and the World Wildlife Fund titled »Beyond GDP«, discussing similar issues. On the OECD side, these initiatives have led to the publication of a »better life index« while the European Commission in 2009 released a road map for the provision of better and more comprehensive data on well-being. In parallel, a number of private think tanks also produced recommendations on possible indicators and approaches.[2]

While the proposals differ in the specific indicators chosen and stressed in the analysis, two main approaches can be distinguished: Under one approach, a wide range of indicators are aggregated into some kind of »national welfare indicator«.[3] The second approach uses a scoreboard of a number of indicators to gauge economic progress.

In principle, there are arguments for each of these approaches. The proponents of an aggregate indicator stress that their approach allows progress in well-being to be summarised in a single figure. Just as one can say today under the traditional approach of GDP measurement that the national economy has expanded by x percent in the past year, one could state that national welfare has increased by y percent.

Proponents of the scoreboard approach counter that, while an increase in economic production of x percent can easily be visualised in the increase of production value by a certain amount of euros, an increase in an aggregate welfare indicator cannot. They fear that because of this difficulty, an aggregate indicator would never get the attention GDP figures get today.

Moreover, aggregating for example the value of economic output and measures of distribution of income requires certain weights to be put on each of these variables which in turn require subjective judgements about the relative merit of each of them. Publishing only an aggregate index would hide these implicit judgements and would otherwise tend to obscure in which areas of well-being improvements have been made and where regression has taken place.

The work on the reform of the Stability and Growth Law and the »magic square« followed these arguments and is thus based on the scoreboard approach.

2 A good survey on these recommendations can be found in the interim report of the German Bundestag's Commission of Inquiry (Enquête-Kommission 2012).

3 See for example Diefenbacher/Zieschank (2011).

3

THE STABILITY AND GROWTH LAW OF 1967

In the history of post-war German economic policy-making, the Stability and Growth Law of 1967 is an important anchor. This law stipulates that all relevant economic policy-makers (namely the federal government and the Länder) are required to take macroeconomic equilibrium into account when making policy decisions. It defines macroeconomic equilibrium as simultaneously reaching the four economic targets of »stable price level«, »high level of employment«, »stable and adequate rate of economic growth«, and »external economic equilibrium« (see figure 1).

These four goals are referred together to as the »magic square«. The term »magic« here has two meanings: First, the achievement of all four goals simultaneously was perceived as a clear and sustainable increase in economic well-being. And second, as pushing towards achieving one target might have negative effects on others (for example, there might be a trade-off between economic growth and inflation), achieving all targets at once was seen as something difficult to achieve.

In order to monitor achievement of the proclaimed goals, the Stability and Growth Law stipulates that the German government has to present an annual economic report (the »Jahreswirtschaftsbericht«). In this report, the government is asked to comment on the Council of Economic Experts' (the »Sachverständigenrat«) evaluation of risks and achievements in the German macroeconomic equilibrium and to specify which policies it is going to pursue in order to mitigate risks and deviations from the equilibrium.

In addition to defining goals for economic policy-making and a monitoring process, the law stipulates some instruments for the coordination of stabilisation policies in the case of (imminent) recession.

Even though the law has not played an important role in practical policy-making in Germany over the past decades (the instruments for the coordination of stabilisation policies have not been used for the past four decades), it is highly popular among the German population as it is associated with a period of widely-shared rising economic prosperity with low rates of inflation and low unemployment during the late 1960s and early 1970s.

In anticipation of the fiftieth anniversary of the Stability and Growth Law in Germany a debate has got under way on whether this law is up to date in its current form. It has been argued, on one hand, that according to the modern understanding of measuring prosperity, economic policy should no longer be directed one-sidedly towards economic growth, inflation and employment[4] and that this should also be reflected in the Stability and Growth Law (Koll 2016). On the other hand, the status quo has been defended on the basis of the supposedly important instruments of the existing Stability and Growth Law (Michaelis et al. 2015).

Figure 1
The goals of the original »magic square«

4 The goal of »external economic balance« laid down in the Stability and Growth Law has been eliminated in current application. For example, the Council of Economic Experts does not define Germany's enormous current account surplus as an »imbalance«. See also the discussion on this in Dullien/van Treeck (2016: 3).

4

BASIC IDEA OF THE NEW »MAGIC SQUARE«

The proposal presented in this paper follows those who argue that the Stability and Growth Law should be updated. According to the basic idea put forward by Dullien/van Treeck (2012), a new Stability and Prosperity Law should replace the previous Stability and Growth Law of 1967. On this basis, economic policy action in Germany should in future be oriented in terms of the four dimensions »material prosperity and economic sustainability«, »sustainability of public sector activities and public finances«, »social sustainability« and »environmental sustainability« (see figure 2). Building on the first proposals of Dullien/van Treeck (2012), Dullien (2015) proposed a total of thirteen individual indicators. The indicators have been chosen to fulfil the following criteria: First, they are all available with little delay and sufficient precision; second, they enjoy broad scholarly assent with regard to depicting the individual dimensions; and third, they cover Germany's international obligations with regard to the individual dimensions.

Under this proposal, at the outset of the legislative period, each new federal government would be obliged to propose trajectories for these individual indicators to be achieved during their period of office. Each autumn, a (reformed) Council of Economic Experts[5] would judge the extent to which the government is on course to fulfil its goals and what risks and dangers look likely to arise in the near future. In response to this annual report the government would have the opportunity in its annual prosperity report (which would replace the previous annual economic report) to present its view of developments. To this end it could use the report to justify deviations from the target trajectories and adjust previous projections.

With such a mechanism the authors hope to shift the public debate away from the one-sided focus of reporting on GDP and public deficits as (hitherto) central indicators of the success or failure of economic policy and also to make clearer conflicts and complementarities that may exist between the various sustainability dimensions in the case of individual economic policy initiatives: a comprehensive evaluation of the development of prosperity, for example, would put policy measures that improve several dimensions at the same time in a more favourable light than measures that improve only one dimension. Initiatives that, for example, only raise economic growth would appear to be less positive than measures that both create economic growth and reduce greenhouse gas emissions.

Figure 2
The goals of the new »magic square«

5 In the original proposal from Dullien/van Treeck (2012) a system of two councils of economic experts is proposed, producing a joint report. Both approaches have advantages and disadvantages, although they will not be discussed in this study because its aim is the further development of individual indicators, not the structure of the proposed reporting.

5

CURRENT DEBATES AND CHANGES IN THE NEW »MAGIC SQUARE«

The debates on proposals on a new Stability and Prosperity Law and a reform of the Stability and Growth Law can be basically divided into two strands: (1) it has been a matter of controversy whether a reform of the Stability and Growth Law would really make sense and is necessary; (2) it has been debated whether the indicators proposed by Dullien (2015) following Dullien/van Treeck (2012) make sense and depict the individual dimensions of sustainability as comprehensively and reliably as possible.

The question of the usefulness of a reform of the Stability and Growth Law was discussed primarily at the instigation of the Federal Ministry for Economic Affairs and Energy (BMWi) and involving the members of the Council of Economic Experts. The conclusions of this institution can be found in a monthly report by the Ministry of Economic Affairs (BMWi 2015), a working paper by the Council of Economic Experts (2015) and in a publication by associates and members of the Council of Economic Experts in the journal *Wirtschaftsdienst* (Michaelis et al. 2015).

In their rejection of the proposed reforms Michaelis et al. (2015) argue as follows:[6]

(1) The Stability and Growth Law historically grew out of efforts to combine »ordnungspolitisch« ideas with then current (so-called »Keynesian«) approaches to economic management. It thus anticipates at least partly »a superordinate definition of economic sustainability« and thus »key aspects of an integrated view of welfare would be covered« (p. 12).

(2) The procedures for accelerated fiscal policy decision-making have not been used for more than forty years. Instead, in the recessions in the early 1980s and in 2008/2009 massive economic stimulus packages were implemented without reference to the Stability and Growth Law and its instruments.

(3) The effectiveness of the instruments provided for in the Stability and Growth Law is fundamentally questionable. Fiscal policy measures have often had less effect on economic growth than had been hoped (due to small multipliers). Furthermore, even large current account surpluses are not necessarily to be regarded as a sign of external economic imbalances; also the influence of changed public spending and tax revenues on the current account is unclear.

(4) Nevertheless the procedures represent an important set of instruments for managing the economy in a crisis, which should not be abolished by a reform.

(5) Because, at the same time, these instruments are not appropriate for achieving other goals, such as social or environmental sustainability, these aims should not be included in the Stability and Growth Law either. The formulation of an expanded set of economic policy instruments would overload the Stability and Growth Law.

As Dullien/van Treeck (2016) demonstrate, these arguments are not convincing: for example, they point out that the understanding of »sustainability« in the old Stability and Growth Law is totally different from the modern understanding of it; in particular all reference is lacking to social or environmental sustainability. Furthermore, the logic of Michaelis et al. (2015) is hardly compelling: the authors from the Council of Economic Experts demand that the law remain unchanged in its overall structure because it contains important instruments for economic policy management, but at the same time acknowledge these instruments have not been used in the past forty years, even in the deepest crisis, and fundamentally doubt the efficacy of economic stimulus via fiscal policy. This argument is neither logical nor consistent. In any case one could retain the previous instruments for economic policy management in a reformed Stability and Growth Law.

Also because the standpoint of the Council of Economic Experts was not considered convincing by participants in the workshops organised by the Friedrich-Ebert-Stiftung and Denkwerk Demokratie the objections of Michaelis et al. (2015) were not used as an occasion to revise the basic proposal of a reform of the Stability and Growth Law and of the »magic square«.

6 The summary was taken from Dullien/van Treeck (2016).

The second strand of the debate, the one about the right indicators for the new »magic square«, focused first of all on the environmental dimension of sustainability. The original proposal on a new »magic square« contained the three indicators »greenhouse gas emissions«, »primary energy consumption« and »share of renewable energies in primary energy consumption«. Dullien/van Treeck (2012) and Dullien (2015) chose these indicators because among the multitude of environmental indicators they are available in a timely and reliable manner, at most with small later revisions, and make a clear statement about certain aspects of the environmental sustainability of economic activity.

As became clear at the workshops, although these three indicators of environmental sustainability can be measured relatively reliably and are available in updated form, they are, on one hand, partly redundant, and on the other, cover only a small part of environmental sustainability. These three indicators are partly redundant because a decline in primary energy consumption and an increase in the use of renewable energies automatically brings with it a reduction in greenhouse gas emissions. The measurement of sustainability is narrowed by these three indicators because they do not cover important other aspects of environmental sustainability, such as land usage or reduction of biodiversity. If all natural areas in Germany were converted into arable land and all wildlife eradicated, it would nevertheless be possible to reduce greenhouse gas emissions and primary energy consumption and substantially increase the share of renewable energies.

In the workshops the view crystallised that with greenhouse gas emissions and primary energy consumption one should retain two of the previous criteria; the share of renewable energies in primary energy consumption, however, should be replaced by an indicator of other aspects of environmental sustainability. The search for an alternative indicator proved difficult, however. The often used »environmental footprint« (which measures human impact on ecosystems), for example, does not differentiate between different kinds and intensity of use of environmental resources (Blomqvist et al. 2013). Something similar applies to aggregated indicators of use of raw materials.

Most appropriate in the end appeared to be – as also proposed by the Bundestag's Commission of Inquiry (2013: 237) – the »national bird index«. This indicator covers the quantitative incidence of domestic bird species and captures both total bird populations and their diversity. This index was set at 100 for 2015 for the number of birds and variety of birds envisaged by the German government in its sustainability strategy. Although this index at first glance covers only a small part of biodiversity, it is, in the view of nature conservation experts, a good indicator for biodiversity overall: a high number and variety of birds generally only occurs in species-rich landscapes with intact habitats. Water and soil pollution or excessive monocultures, by contrast, regularly lead to shrinking bird populations. The bird index is thus an indicator that covers much more than what it actually measures. As proposed by the Commission of Inquiry (2013: 269) the bird index is deployed for agricultural land that contains 37 bird varieties.

However, this indicator is not unproblematic, because the bird population in Germany is currently only »semi-officially« recorded by volunteers in cooperation with ornithological centres of the federal Länder (German Government 2016). As a result it is often only available after considerable delay: at the time of writing, at the beginning of 2017, the most recent data were for 2013. Among the plethora of indicators discussed for environmental sustainability besides energy consumption and greenhouse gas emissions, however, it nonetheless appears to be one of the most appropriate indicators.

Furthermore, it was discussed at the workshops whether inflation should be one of the indicators for the dimension »material prosperity and economic sustainability«. Although the participants agreed that inflation is an important economic variable for many people and one that clearly influences life satisfaction, according to happiness research (Blanchflower et al. 2014), the inclusion of the inflation rate in a framework for the governance and coordination of national German economic policy nevertheless gives rise to a number of conceptual problems. On one hand, the responsibility for fighting inflation within the structure of the euro zone is clearly assigned to the European Central Bank (ECB). A simultaneous assignment to the national level could lead to conflicts between national and European policymaking. According to the results of happiness research higher inflation is always negative. Deflation, by contrast, does not directly influence the population's well-being (Blanchflower et al. 2014). For the stability of the financial system, however, deflation is clearly negative. For the stability of the euro zone, though, a longer-term deviation of national inflation from the ECB's target inflation could be problematic (for example, Fritsche et al. 2005), but it could also just represent a correction of previously existing imbalances. Because the evaluation of certain inflation rates according to these different criteria sometimes turns out inversely, it is difficult to define a clear target for the inflation path for the new »magic square«.

The consensus at the workshops organised by the Friedrich-Ebert-Stiftung and Denkwerk Demokratie was thus to leave unchanged the indicators in the dimensions »material prosperity and economic sustainability«, »sustainability of public sector activities and public sector finances« and »social sustainability« as against the earlier work of Dullien/van Treeck (2012) and Dullien (2015) (and despite all the associated shortcomings not to include the inflation rate).

Table 1 summarises the indicators used in the updated version of the new »magic square«. Requirements arising from international obligations are marked in red; indicators that were included in the study by Dullien (2015) but have now been withdrawn are crossed out. Newly added indicators are in bold.

Table 1
Dimensions and indicators in the updated new »magic square«

Main aims	Material prosperity and economic sustainability	Sustainability of public sector activities and public sector finances	Social sustainability	Environmental sustainability
Individual indicators	• GDP (per capita and per working hour) • Employment rate • Private and public consumption spending • Current account balance +/– 3%	• Deficit targets • 1/20 rule • (Adjusted) net public investment	• At risk of poverty rate (60% of median income) • Income quintile ratio (S80/S20) • School-leavers without upper secondary qualifications	• Targets for greenhouse gas emissions • Primary energy consumption • ~~Share of renewable energy in primary energy consumption~~ • **National bird index**

Notes:
Red: Requirements arising from international obligations.
Crossed out: Indicators withdrawn compared to Dullien (2015).
Bold: Indicators added compared to Dullien (2015).

6

INDICATORS AND TRAJECTORIES

In the following sections we shall briefly discuss the indicators used and their trajectories. The explanations follow Dullien (2015).

According to Dullien/van Treeck's (2012) basic idea each federal government should, on coming to office, set and publish targets for the future development of indicators in the four sustainability dimensions. Because the idea of a new »magic square« has not (yet) been implemented by law, however, such goals are lacking. In the absence of such goals we therefore selected some for the present study that correspond to Germany's international obligations (for example, the Stability and Growth Pact, including the so-called »six pack«, the fiscal pact and the Europe 2020 Strategy). Where there are no international obligations plausible trajectories were construed from documents such as reports by the Council of Economic Experts, analyses by economic research institutes or coalition agreements and government declarations.

6.1 MATERIAL PROSPERITY AND ECONOMIC SUSTAINABILITY

The dimension of material prosperity and economic sustainability describes how a country's economic performance develops and whether there are serious macroeconomic risks to the stability of this performance.

6.1.1 GDP PER CAPITA AND PER WORKING HOUR

Real (inflation-adjusted) GDP, the sum of goods and services produced in Germany in a year, remains an important indicator of economic performance. GDP was chosen here because, despite its familiar weaknesses, it remains the best and most up to date indicator of economic performance and also plays a prominent role in the broader economic policy debate. For the measurement of prosperity, however, it is less the absolute level of GDP as a whole that is important. Instead, Dullien/van Treeck (2012) proposed looking at inflation-adjusted GDP per capita (which more or less captures disposable income per inhabitant across the economy) and at inflation-adjusted GDP per working hour (which takes into account the necessary work input, with the implication that leisure time has value in its own right).

For practical application in this study the averaged growth rate of real GDP per capita and real GDP per working hour was used for this indicator. The basic data for this purpose were taken from the European Commission's AMECO database.[7]

There is no international benchmark for the growth of GDP per capita and per working hour. In an economy with a stable employment rate, stable working time and without population growth, however, an increase in GDP can be achieved only by improving productivity. If one looks at the historical data on productivity growth both for Germany and the rest of the world productivity growth of 1.25 per cent per working hour and year appears to be realistic. Therefore for this study an annual GDP growth of 1.25 per cent both per capita and per working hour is set as a target for economic policy.

6.1.2 EMPLOYMENT RATE

Another important indicator of economic performance and the participation of the broadest possible population strata in gainful employment is the employment rate. This measures the share of employees in the population of working age. The employment rate is a better indicator of participation than, for example, the unemployment rate because only those people who are available for work and have been actively seeking work in the recent period are counted as unemployed. Demotivated long-term unemployed or parents unable to arrange child care are thus not counted as unemployed but do show up in a (lower) employment rate.

The employment rate is also up to date and internationally comparable. It is also part of the indicator system of the Europe 2020 initiative. The data on this indicator were thus taken from Eurostat's Europe 2020 database.

7 All data in this study for 2016 represent estimates from the AMECO database as of 12 December 2016.

Within the framework of the Europe 2020 Strategy (agreed in 2010) the German government set itself the target of achieving an employment rate of 77 per cent by 2020. As a trajectory for the present study, therefore, for the years after 2010 we assumed a steady linear increase in the employment rate from the then rate of 74.9 per cent to the 77 per cent targeted for 2020. Because no such target existed for 2009 and 2010 we assumed the maintenance of the employment rate as a trajectory.

6.1.3 PRIVATE AND PUBLIC CONSUMPTION

The aim of doing business, according to the common understanding, is not solely the production of goods and services, but above all to increase the wellbeing of individuals by means of the use of these goods and services, which is designated in economic terminology as »consumption«. Goods and services can be consumed both by private households and by the public sector – both increase wellbeing. An example of the rising consumption of private households would be the purchase of more or better products; an example of rising consumption by the public sector would be the appointment of more police to reduce crime or the maintenance of public spaces, such as parks.

Dullien/van Treeck (2012) propose, besides GDP, also to include (inflation-adjusted) consumption per capita in the evaluation of material wellbeing. Looking at consumption as an indicator in addition to GDP ensures that the kind of increases that really improve the material circumstances of the individual can be taken into consideration. Income increases for a rich minority that are just saved, although showing up in GDP, do not reflect rising consumption. Within the framework of this study inflation-adjusted public and private consumption spending per capita are added up to measure consumption development. For that purpose the corresponding data from the European Commission's AMECO database were used.

The way of measuring consumption proposed here covers both the quantitative increase and the qualitative improvement of consumption: both the purchase of more t-shirts and a switch from conventionally produced food to organic (because this is usually more expensive and thus has a higher consumption value) count as increases in consumption.

Similar to the development of GDP there is no clear national or international target for the development of consumption. As already mentioned, however, an increase in GDP is unlikely to improve people's wellbeing without a similar increase in private and public consumption spending. Thus an annual increase of 1.25 per cent per year was assumed as trajectory for the sum of (inflation-adjusted) private and public consumption spending per capita – the same as for GDP per capita. The background to this is that consumption should as much as possible rise in equal measure to GDP.

6.1.4 LARGELY BALANCED CURRENT ACCOUNT

Dullien/van Treeck (2012) proposed the criterion of a largely balanced current account as an important indicator of macroeconomic stability and thus for economic sustainability. This indicator operates in the tradition of the original Stability and Growth Law of 1967, which postulated »external economic balance« as an aim.

Even today a reasonably balanced current account is a key indicator of stability: large current account deficits increase a country's external debt and thus endanger debt sustainability. Large current account surpluses, given accounting identities, entail growing indebtedness of foreign trade partners and thus destabilise the external economic environment. Furthermore, large surpluses lead in the medium to long term to revaluation pressure on the national currency and thus jeopardise medium- to long-term export opportunities.

For this study we used data on current account development relative to GDP from the IMF database.

At the beginning of the period of investigation, in 2009, there were no international or national obligations with regard to a largely balanced current account.[8] As part of the so-called »six pack«, however, the »procedure for avoiding macroeconomic imbalances« was established at EU level in 2011. Within the framework of the scoreboard used in this procedure upper limits of 4 per cent of GDP for deficits and 6 per cent of GDP for surpluses now apply to current account deficits and current account surpluses.

However, even before these regulations there was a lively debate on sensible limits for current account imbalances. A clear demarcation of the point at which a current account surplus becomes problematic is not easy from a theoretical standpoint. Dullien and Schwarzer (2009) argue, following the original Stability and Growth Pact, that an upper limit for deficits and surpluses in the current account of 3 per cent of GDP in the case of plausible assumptions about inflation and economic growth would restrict a country's external debt or net foreign receivables to 60 per cent of GDP. Horn et al. (2010) even call for a stricter limit of a maximum plus/minus 2 per cent of GDP.

On the introduction of upper and lower limits there was lively discussion between those concerned. The European Commission had originally proposed a symmetrical goal of 4 per cent of GDP; the asymmetrical treatment of surpluses was introduced primarily under pressure from the German government. Even the European Parliament initially vehemently criticised this compromise. In fact, there is no relevant academic literature that would justify the setting of asymmetrical limits.

Thus as a trajectory for this study instead of the European Commission's limit we laid down an upper limit of 3 per cent of GDP for current account surpluses and current account deficits.

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8 Although the Stability and Growth Law of 1967, which is still on the statute book, lays down the goal of »external economic balance«, today an external economic balance is defined by many economists as a situation in which »incoming payments from abroad correspond during the same period to payments flowing abroad and the »component balances of the balance of payments are balanced« (Pollert et al. 2013). According to this definition there is no imbalance as long as the current account imbalances are balanced by corresponding (private) capital flows. This is the case in Germany, despite the high surpluses.

6.2 SUSTAINABILITY OF PUBLIC SECTOR FINANCES AND PUBLIC SECTOR ACTIVITIES

The dimension »sustainability of public sector finances and public sector activities« describes the extent to which the public sector operates sustainably with its borrowing and investment decisions. For example, just as in the evaluation of the health of a company not only the liabilities, but also the assets must be taken into consideration, so here not only the public deficit and public debt must be taken into consideration, but also public investments.

6.2.1 STRUCTURALLY BALANCED GENERAL GOVERNMENT BUDGET

An important indicator of the sustainability of public sector finances is annual net borrowing. The higher new net borrowing in relation to given economic growth and given inflation the more rapidly the debt level rises. Germany has obliged itself to maintain a structurally largely balanced government budget both in the Basic Law (the »Grundgesetz«) and via a series of European agreements (six pack, fiscal pact). Net borrowing is thus adopted as an indicator.

For this study the data from the European Commission's AMECO database on general government cyclically adjusted net borrowing was used to evaluate the public deficit and the general government balance.

The trajectory is derived from the rules of the six pack. The main point is the general obligation to achieve a cyclically adjusted public deficit of no more than 0.5 per cent of GDP.[9] This is a substantial tightening up of the earlier version of the Stability and Growth Pact that was commonly interpreted to mean that individual states should keep their public deficits below 3 per cent of GDP.

For the purposes of this study a maximum value for the (cyclically adjusted) public deficit of 3 per cent of GDP was adopted for 2009 and 2010 (which were also affected by the global financial and economic crisis and the fiscal burdens arising from it). In line with the debt brake rules (adopted in 2009) and the six pack (adopted in 2011), a linear reduction of the 2010 deficit of (cyclically adjusted) 3.4 per cent of GDP to a level of 0.5 per cent of GDP in 2014 was adopted for the trajectory. From 2014, it was assumed that the target for the deficit was 0.5 percent of GDP (again in line with debt brake and six pack).

6.2.2 REDUCTION OF PUBLIC DEBT LEVEL IN ACCORDANCE WITH THE 1/20 RULE

The public-debt-to-GDP ratio is an important – albeit imperfect – indicator of the sustainability of public debt. Given their – by historical comparison very high – public debt levels the European states have committed themselves to limiting the government debt ratio to 60 per cent of GDP.

This study used data on gross government debt relative to GDP from the European Commission's AMECO – as also used within the framework of the EU procedure.

The six pack and the fiscal pact prescribe a rate of reduction of the debt ratio for countries whose debt level is above 60 per cent of GDP (in other words, also for Germany from 2010 onwards). According to these rules each year the debt ratio should be reduced by 1/20 of the difference between the current debt ratio and the target value of 60 per cent of GDP.[10]

From these requirements the following trajectory was derived for the government debt ratio: for the years 2009 to 2011 the target of not allowing the government debt ratio to rise above the level of the previous year. From 2012 the 1/20 rule.

6.2.3 NET PUBLIC INVESTMENT

The sustainability of public sector activities can be measured not only in terms of the government debt ratio and public deficits, however. When a government limits its debts, but at the same time neglects its infrastructure and the education of its population sustainability can be endangered even more than in the case of higher borrowing and solid investments in infrastructure and education.

Following this line of argument Dullien/van Treeck (2012) propose taking »adjusted public net investments« as a further criterion of the sustainability of public sector activities. The authors argue that the usual definition of investment activity – construction or purchase of buildings and capital goods – is unsatisfactory because, on one hand, public spending is counted as investment that does not create future economic growth or future wellbeing for the population (for example, prestige buildings such as pompous city halls) and on the other hand public spending is not counted as investments that, for example, will increase human capital and thus in the long term lead to more economic growth and wellbeing (spending on teachers' wages, for example, is counted as consumption). The two authors thus propose adjusting public net investments for non-productive spending, such as on prestige projects, but including spending that represents investments in human capital and similar things, which traditionally is counted as public consumption.

Even if this argumentation is consistent the demand for an adjustment of net investments is not pursued within the framework of this study. At present only data on unadjusted net investments are available up to date and on a regular basis and calculation of the adjusted net investment rate is not conveniently feasible. Thus for this study the unadjusted net investment ratio (as a percentage of GDP) was used to evaluate net investments; the corresponding data come from the European Commission's AMECO database.

In the international sphere Germany has made no commitments with regard to net public investments. The relevant

9 There are exceptions, among others, for countries with a debt level of below 60 per cent of GDP. The details are not further addressed here because they are not relevant for this study.

10 A country that has a debt ratio of 80 per cent of GDP (for example, Germany in 2010) would accordingly have to reduce the ratio each year by (80 – 60)/20 = 1 percentage point, until the 60 per cent level is achieved.

government declarations and coalition agreements do not give a clear target for net investments, either. Thus the question arises of the choice of the right trajectory.

This was based on the assumption that the public capital stock should grow in the medium term at least with the same speed as the overall economy. This can be regarded as a minimum requirement: there are no theoretical considerations that would lead to the conclusion that in a developed economy the public capital stock should be smaller relative to GDP than in a less developed economy. In fact, empirically rather the opposite is the case: in more developed economies the public capital stock is usually higher than in poorer economies.

As a second aspect the question arises of what level of public capital stock should be taken as a benchmark. This question is relevant because, due to neglected replacement investments, the public capital stock has been substantially reduced in recent years. There is good reason to take the capital stock in the 1990s as target value before the period in which the public authorities no longer invested to make good wear and tear. According to the calculations of the Kiel Institute for the World Economy (IfW) the capital coefficient for the public capital stock in Germany in the early 1990s was a little more than 0.5, falling to 0.45 by 2000; in other words, the public capital stock was between 45 and 50 per cent of GDP (Boysen-Hogrefe 2013). In order that a capital stock of this magnitude grow by the target rate of GDP growth, public net investments of around 0.6 per cent of GDP are needed each year.[11] Such an investment rate would also cause the current (smaller) public capital stock to gradually rise to the target level again. Thus a public net investment rate of 0.6 per cent of GDP was laid down as trajectory for this study.

6.3 SOCIAL SUSTAINABILITY

The results of happiness research underline that social cohesion is important for people's wellbeing. Furthermore, the constant divergence of living standards in a country jeopardises economic and political stability and thus also economic progress.[12] The dimension of social sustainability should thus depict the improvement or maintenance of social cohesion. For that purpose indicators were chosen that are used in the Europe 2020 Strategy and international comparative research.

6.3.1 AT-RISK-OF-POVERTY RATE

The first individual indicator in this dimension is the »at-risk-of-poverty rate«. In contrast to the developing countries, where poverty is defined in terms of an absolute sum of money (for example, 1 or 2 US-$ a day), for the industrialised countries the risk of poverty is usually defined relative to national median income. The Europe 2020 Strategy includes a calculation of the share of the population that receive less than 60 per cent of the national median income, after transfers.[13] Although this part of the population is not poor in the sense that the persons affected are undernourished or homeless, nevertheless it is at risk of being unable to participate in social life because its disposable income is insufficient. Therefore this indicator was also used for the present study.

Data for this at-risk-of-poverty rate from Eurostat's Europe 2020 database were used for this study.

The EU has made it a target to reduce the number of people at risk of poverty and social exclusion by 20 million by 2020 compared with 2008. For Germany there is no official quantitative correspondence because in its national reform plan Germany instead laid down the target of reducing long-term unemployment. Because, however, reducing the risk of poverty is a broader and more relevant aim than that of reducing long-term unemployment there is something to be said for adhering to a reduction in the at-risk-of-poverty rate also for Germany. The European target corresponds to a reduction of around 17 per cent by 2020 (in 2008 115.7 million people in the EU were threatened by poverty). If one similarly wanted to reduce the number of people threatened by poverty in Germany by 17 per cent this would correspond to a reduction of the at-risk-of-poverty rate from 15.2 per cent in 2008 to 12.6 per cent in 2020. For this study the aim of cutting the at-risk-of-poverty rate to 12.6 per cent by 2020 was thus adopted.[14] Because the Europe 2020 Strategy was only adopted in 2010 a constant at-risk-of-poverty rate was assumed as a target for 2009 and 2010; from 2011 a linear reduction to the 12.6 per cent target by 2020.

6.3.2 INCOME QUINTILE RATIO (S80/S20)

The second individual indicator of this dimension is the income quintile ratio S80/S20. This ratio depicts the disposable income of the richest fifth of the population in relation to that of the poorest fifth. As in the case of the at-risk-of-poverty rate, equivalent income is used, in other words weighted by household composition. An income quintile ratio of 4 means that the richest 20 per cent of the population has four times as much disposable income per capita as the poorest 20 per cent. A rising income quintile ratio thus indicates growing inequality.

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11 More precisely, for the determination of the required net investment by the public sector one has to multiply the capital coefficient by the targeted GDP growth rate. At a capital coefficient of 0.45 a trajectory for net investments of 0.56 per cent of GDP is given, while at a capital coefficient of 0.5 the trajectory would be 0.63 per cent of GDP.

12 For a detailed overview of the research on the relationship between inequality and economic growth see, for example, Ostry et al. (2014). See also the recent study of the literature by Behringer et al. (2016) and the recent simulation study for Germany by Albig et al. (2016), produced at the instigation of the Friedrich-Ebert-Stiftung.

13 For this calculation household incomes are usually converted into equivalent incomes that take into account the different monetary needs for example, of adults in contrast to children in different age groups.

14 Such a reduction is not unrealistic. In 2013 the at-risk-of-poverty rate stood at this level or lower in the Czech Republic, Denmark, the Netherlands, Slovakia and Finland.

Data for the income quintile ratio for this study were taken from Eurostat's corresponding Europe 2020 database.[15]

Germany has not entered into any obligations concerning income distribution, even though the income quintile ratio is monitored within the framework of the Europe 2020 Strategy. However, numerous documents, such as coalition agreements and government declarations, indicate that at least a further increase in income inequality is not desirable.

In fact, income inequality in Germany has risen substantially since the 1990s. In the late 1990s the incomes of the richest 20 per cent stood at just under four times – and sometimes only 3.5 times – the incomes of the poorest 20 per cent, from the mid-2000s this rose rapidly and in 2007 reached a high of 4.9. A slow reversal of inequality and of the income quintile ratio back to 4 would thus appear a plausible trajectory. Thus inequality would correspond to that measured in Austria or Switzerland in 2013, although it would still be well above the levels of inequality in the Czech Republic, the Netherlands, Finland, Slovenia, Slovakia or Sweden.

For this study keeping income inequality constant was thus chosen as trajectory for the years 2009 and 2010 (before the coming into force of the Europe 2020 Strategy), while for the period from 2011 to 2020 a (linear) decrease of the income quintile ratio to 4 was selected.

6.3.3 SCHOOL-LEAVERS WITHOUT UPPER SECONDARY QUALIFICATIONS AND WITHOUT FURTHER TRAINING OR EDUCATION

For social cohesion it is important to prevent young people from leaving education or training too early and to ensure that they obtain qualifications that later on enable them to obtain an income sufficient to allow them to participate in social life. In order to assess the extent to which this is the case in modern industrialised societies, within the framework of the Europe 2020 Strategy the share of the population aged from 18 to 24 that has not achieved higher secondary school qualifications and is not in further education or training is measured. In the German education system persons with at most lower secondary education are those who have only the basic school leaving certificate or none at all, or lack occupational training (and are not in a corresponding education or training programme).

The rate of school-leavers without upper secondary qualifications and without further education or training is calculated and published by the EU within the framework of the Europe 2020 Strategy. The data in the present study were taken from the corresponding European Commission database.

Within the framework of the Europe 2020 Strategy Germany has committed itself to reduce the rate of school-leavers without upper secondary qualifications and without further education or training to 10 per cent by 2020. As a trajectory for 2009 and 2010 therefore (before the coming into force of the Europe 2020 Strategy) the previous year's rate was assumed, while from 2011 a linear decrease to the target value of 10 per cent by 2020.

6.4 ENVIRONMENTAL SUSTAINABILITY

The dimension of environmental sustainability is supposed to depict the extent to which a society's resource consumption has improved or deteriorated. The measurement of this dimension is related to a particularly large number of difficulties because there are few uncontroversial broad indicators that compare resources comprehensively and, at the same time, with regard to which precise data are available in up to date form.

6.4.1 EMISSION OF GREENHOUSE GASES

Global warming is one of the most important global environmental policy challenges. The national emission of greenhouse gases is thus a key factor in the environmental sustainability of economic activity in Germany. The emission of greenhouse gases is thus measured with reference to the emission of CO_2 equivalents, this includes the emission of carbon dioxide (CO2), methane (CH4), nitrous oxide (N2O), hydrofluorocarbons (HFCs), perfluorinated hydrocarbons (PFCs) and sulphur hexafluoride (SF6). The emission of greenhouse gases is measured relative to the level of 1990.

The corresponding data are collected and published within the framework of the Europe 2020 Strategy. The data for this study were taken from the corresponding Eurostat database. Because figures were not available there for 2013, emissions were updated with figures from the German Statistical Office.

With regard to the reduction of greenhouse gas emissions Germany set itself the target, within the framework of the Europe 2020 Strategy, of reducing the level of emissions by 40 per cent by 2020 in relation to the reference year 1990. For the present study, therefore, the previous year's rate was assumed to be constant as a trajectory for 2009 and 2010 (before the coming into force of the Europe 2020 Strategy), while from 2011 a linear reduction to the target value of 60 per cent of the 1990 level was laid down to be achieved by 2020.

6.4.2 PRIMARY ENERGY CONSUMPTION

Another indicator of environmental sustainability in an economy is primary energy consumption. This is usually measured on the basis of domestic gross consumption of energy (not including non-energy related consumption, for example, by the chemical industry) and stated in million tonnes crude oil equivalent (Mtoe). This includes both renewable and non-renewable energy.

The data for this indicator also come from Eurostat's Europe 2020 Strategy database. Because this time series concerns above all making savings in primary energy consumption the time series for further utilisation is indexed at 100 in 2008.

Germany has set itself the target of reducing primary energy consumption by 20 per cent by 2020 in relation to

15 The choice of the S80/S20 indicator as measure of inequality is based on pragmatic grounds: this indicator – in contrast to, for example, the Gini coefficient – is part of the Europe 2020 Scoreboard. The focus on income inequality instead of on the (also important) wealth inequality arises from the lack of reliable time series on wealth distribution.

the reference year of 2008. For the present study, therefore, the previous year's rate was assumed to be constant as a trajectory for 2009 and 2010 (before the coming into force of the Europe 2020 Strategy), while from 2011 a linear reduction to the target value for primary energy consumption of 80 per cent of the 2008 level was laid down to be achieved by 2020.

6.4.3 NATIONAL BIRD INDEX AGRICULTURAL LAND

As already discussed the national bird index is an important indicator of biodiversity in a country. The national bird index measures both the number of birds by species and the range of species. The index is standardised at 100 for the target set by the German government in 2015. Based on international comparison the subindex for birds on agricultural land is used.

The data for this national bird index come from Eurostat.

The definition of a trajectory is relatively simple in relation to this index. Because the German government set the target of an index value of 100 for 2015 the trajectory results from a linear trend based on the value for 2008 up to the target value of 100 in 2015.

7

DEVELOPMENT OF THE FOUR SUSTAINABILITY DIMENSIONS UP TO 2015

In the following sections the extent to which the targets of German economic policy have been met will be analysed based on the previously defined trajectories for the period up to 2015. A cautious outlook on meeting targets in 2016 will also be given. The focus will be on the years from 2014 because the years up to and including 2013 have already been exhaustively analysed in Dullien (2015). Moreover, the period from 2014 onwards represents a new legislative period in Germany, with a Grand Coalition with participation of the Social Democrats.

For the dimension of »environmental sustainability« the whole period since 2008 will be examined because this dimension has changed to a greater degree due to the replacement of one of the indicators in contrast to Dullien (2015).

7.1 MATERIAL PROSPERITY AND ECONOMIC SUSTAINABILITY

Already in looking at developments up to 2013 (see Dullien 2015) it was established that since the financial crisis of 2008/2009 material prosperity in Germany has developed positively overall, although risks to macroeconomic stability have increased. This trend continued for 2014 and 2015 (and is not likely to have changed in 2016, according to the available estimates).

A particularly positive development to be noted is growth in private and public consumption per capita – in 2015 this was even slightly above the target value (see Figure 3). Overall the development of consumption per capita is thus almost exactly on trajectory (see Figure 4).

Figure 3
Growth of private and public consumption per capita (% increase on previous year)

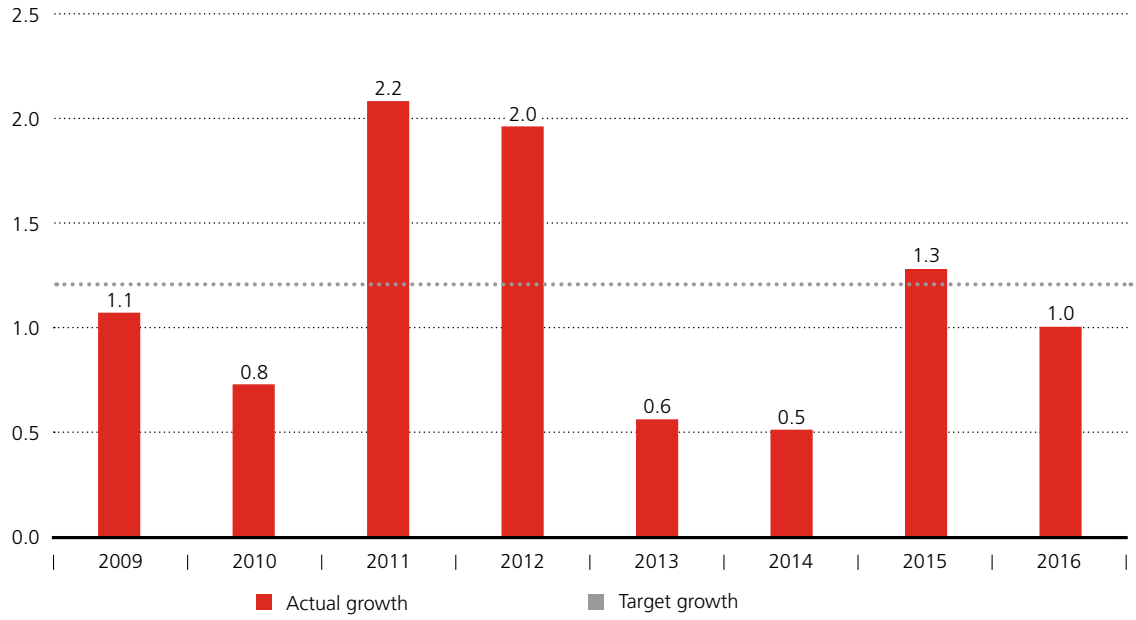
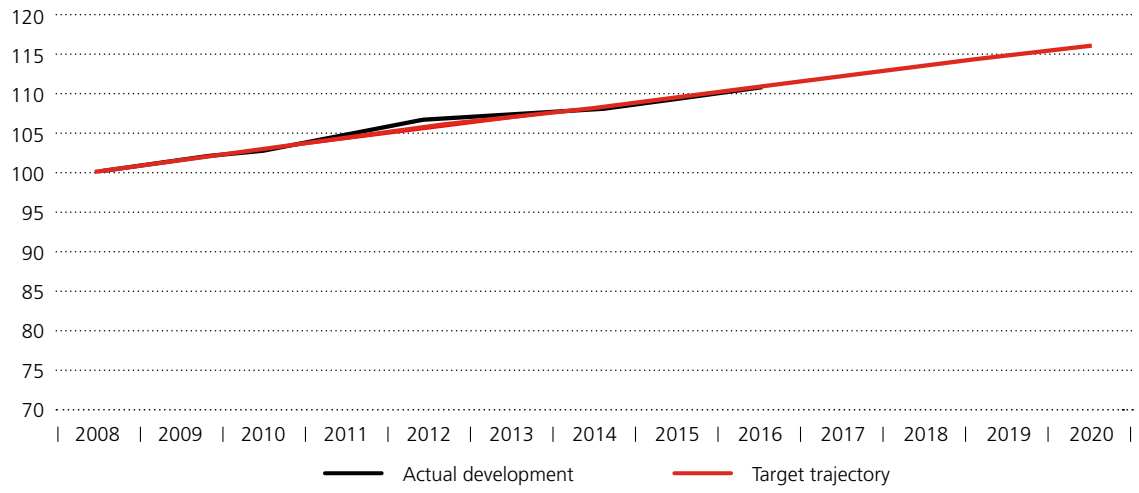


Figure 4
Private and public consumption per capita (2008 = 100)



The employment rate also continued to develop very positively. In fact, the target value of 77 per cent envisaged for 2020 was already substantially exceeded in 2015 with a value of 78 per cent (see Figure 5).

GDP per capita and GDP per hour look more problematic. Although GDP growth measured in this way edged upwards in 2013 and 2014 in comparison with the two weak preceding years, with a value of 0.8 per cent, it remained substantially below the target value of 1.25 per cent per year (see Figure 6). Thus in recent years the gap between the target trajectory and real development widened (see Figure 7). This weak economic growth alongside a rising employment rate indicates problems with productivity growth in Germany – possibly a consequence of the continuing weak public investment activity, although also in the private sector.

Deviation from the target also increased in relation to the current account balance. In 2014 and 2015 (and according to all estimates also 2016) Germany moved further away from both the European Commission's target value of a maximum 6 per cent of GDP and from the target value used in this study of a maximum 3 per cent of GDP (see Figure 8).

Figure 5
Employment rate (%)

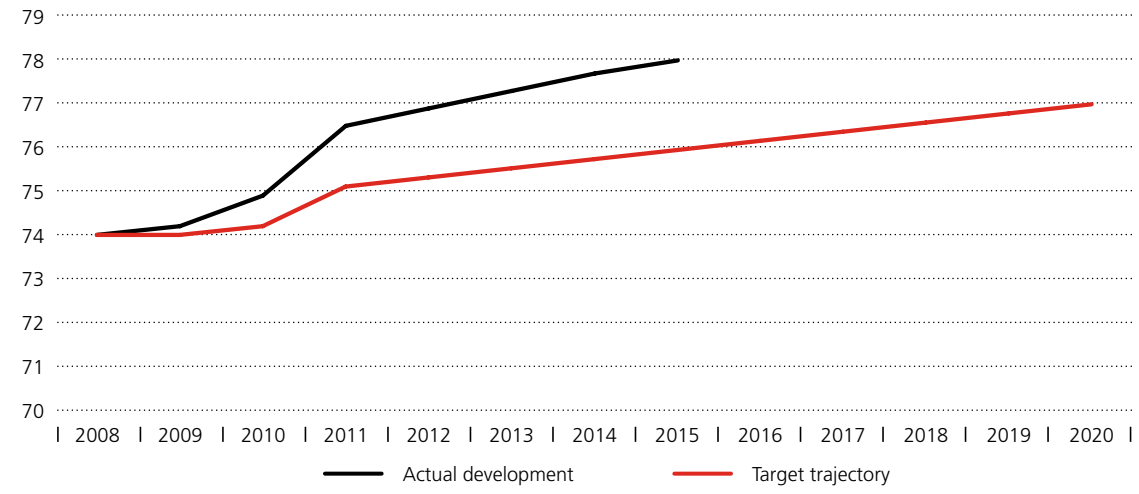


Figure 6
GDP growth per capita and per working hour (% increase on previous year)

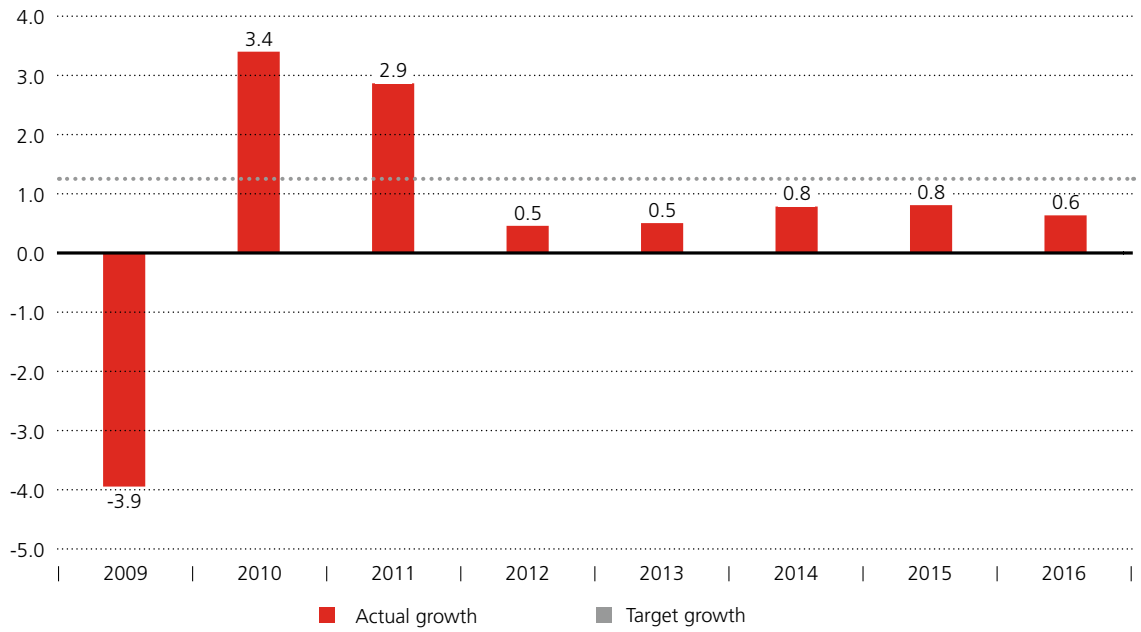


Figure 7
GDP per capita and per working hour (2008 = 100)

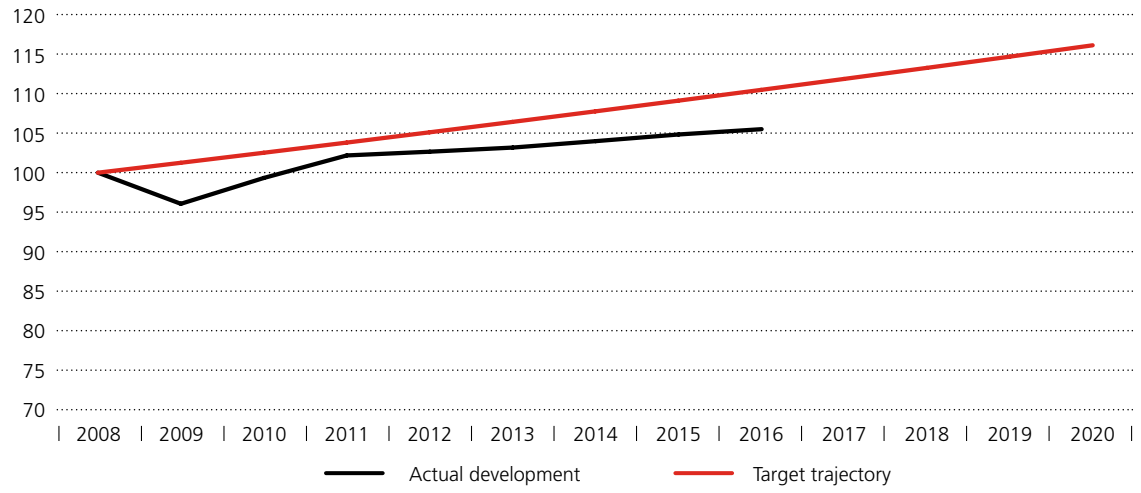
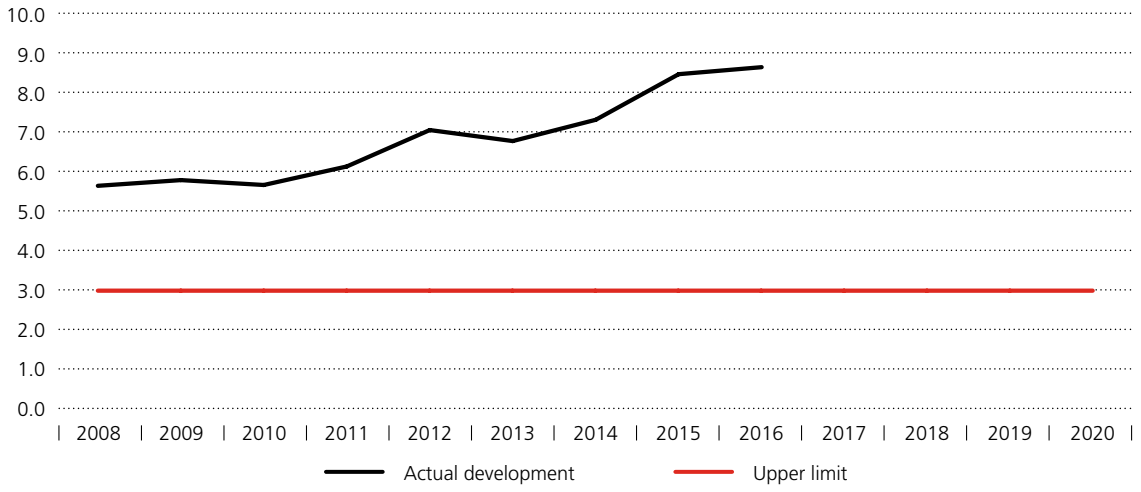


Figure 8
Current account balance (% of GDP)



7.2 SUSTAINABILITY OF PUBLIC SECTOR FINANCES AND PUBLIC SECTOR ACTIVITIES

As already in the years up to 2013 the sustainability of public finances and public sector activities also developed in a very fragmented way from 2014: while public finances narrowly defined developed sustainably, development with regard to public net investments remained problematic.

The general government budget recorded a structural surplus from 2014 to 2016, as in previous years (see Figure 9). Thanks to a robustly growing economy the public debt ratio fell substantially, below the target value for 2020 already in 2015 (see Figure 10).

The situation with regard to public net investments, by contrast, initially deteriorated further. For example, the net investment rate (as a proportion of GDP) at first fell further from 2013 to 2014. Despite slight rises in 2015 and 2016 the rates were still negative in these two years; amortisation thus exceeded replacement investments (see Figure 11). Overall, the public capital stock has shrunk continuously in Germany since 2012.

Figure 9
General government budget balance (% of GDP, cyclically adjusted)

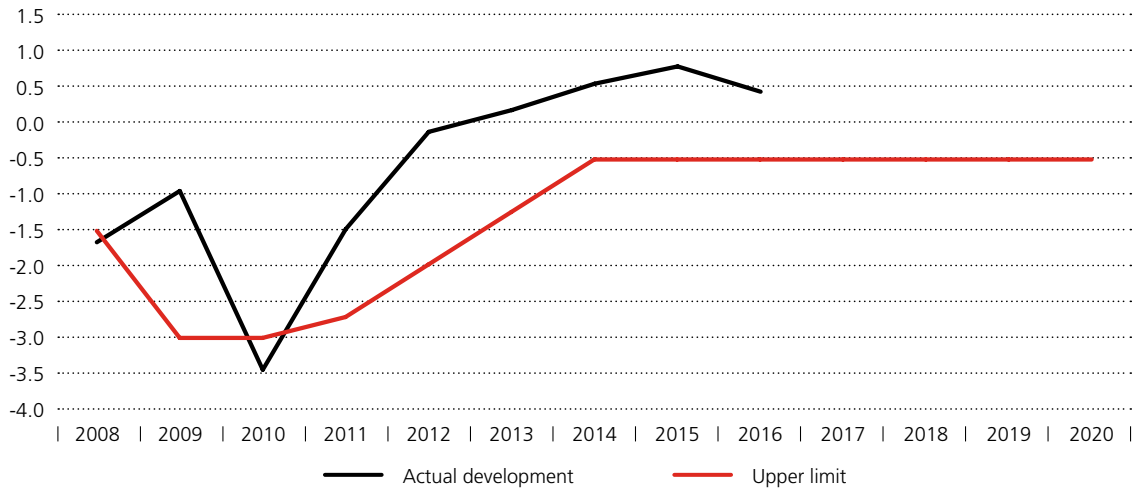


Figure 10
Public debt level (% of GDP)

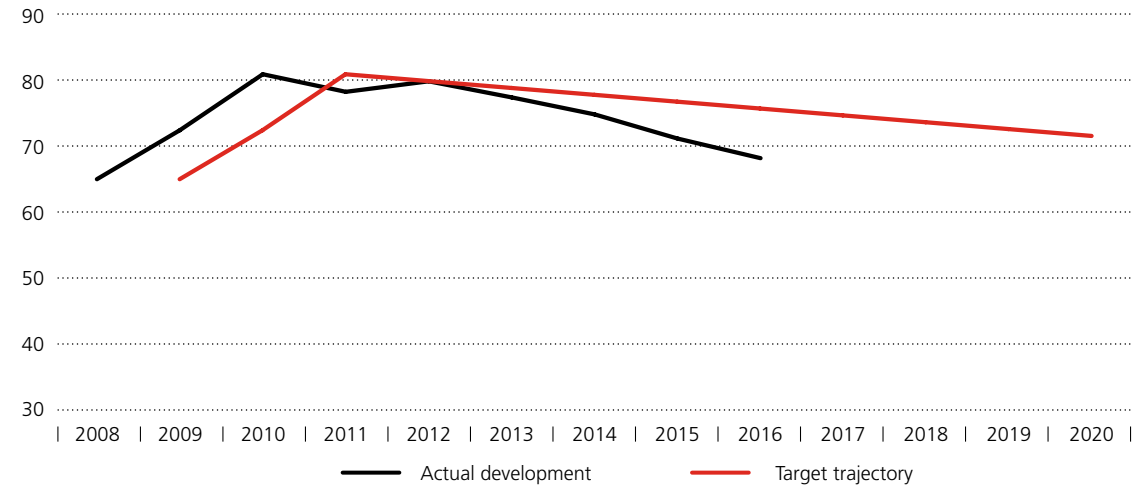
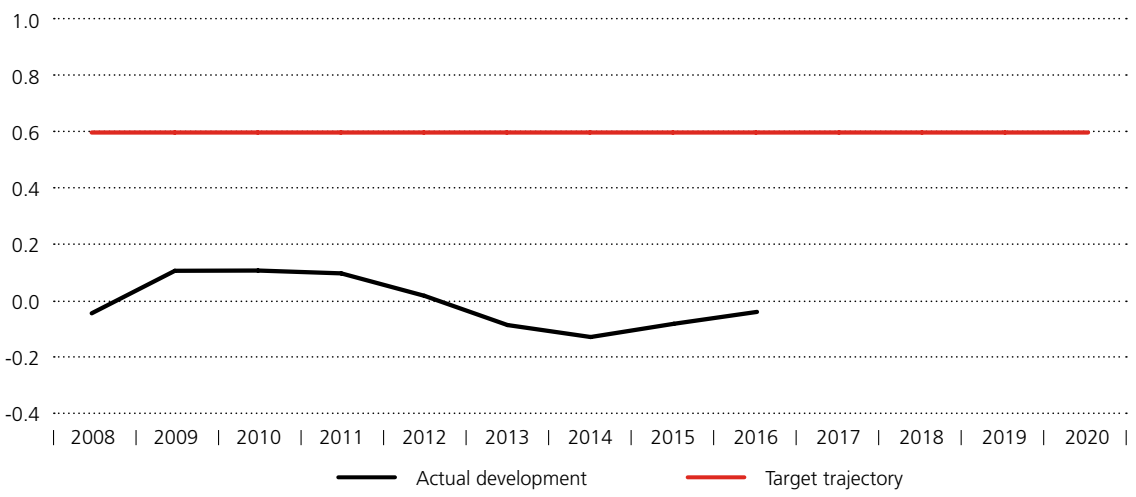


Figure 11
Public net investments (% of GDP)



7.3 SOCIAL SUSTAINABILITY

Social sustainability also developed unfavourably. Only in the case of the number of school-leavers without upper secondary qualifications and further education/training was the trajectory maintained in 2014 and 2015. In relation to both the at-risk-of-poverty rate and income distribution the trajectories were missed. Both indicators deteriorated in comparison with the beginning of the legislative period 2013.

Thus the at-risk-of-poverty rate rose markedly in 2014 and in 2015 remained at the higher level (see Figure 12).[16]

The gap with the trajectory thus grew substantially because said trajectory – as described above – provides for a reduction of the risk of poverty by 2020. Income inequality, measured on the basis of the income quintile ratio S80/S20, deteriorated so substantially in 2014 that even a slight improvement in 2015 was unable to make up for it (see Figure 13).

The rate of school-leavers without upper secondary qualifications rose slightly in 2015 after two continuous falls, but ultimately stood near to the target value envisaged for 2020 (see Figure 14).

16 Estimates for 2016 are not yet available.

Figure 12
At-risk-of-poverty rate (%, after transfers)

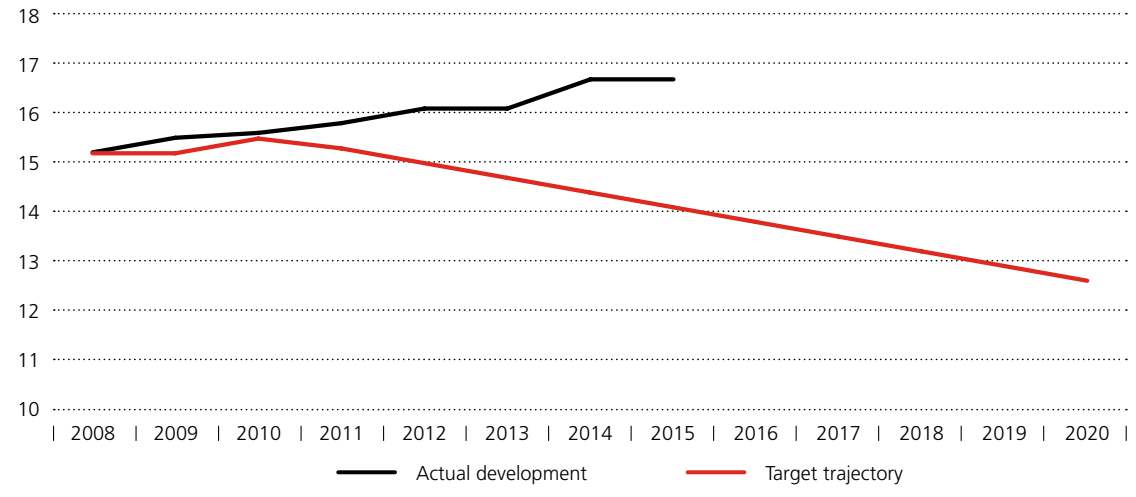


Figure 13
Income quintile ratio (S80/S20)

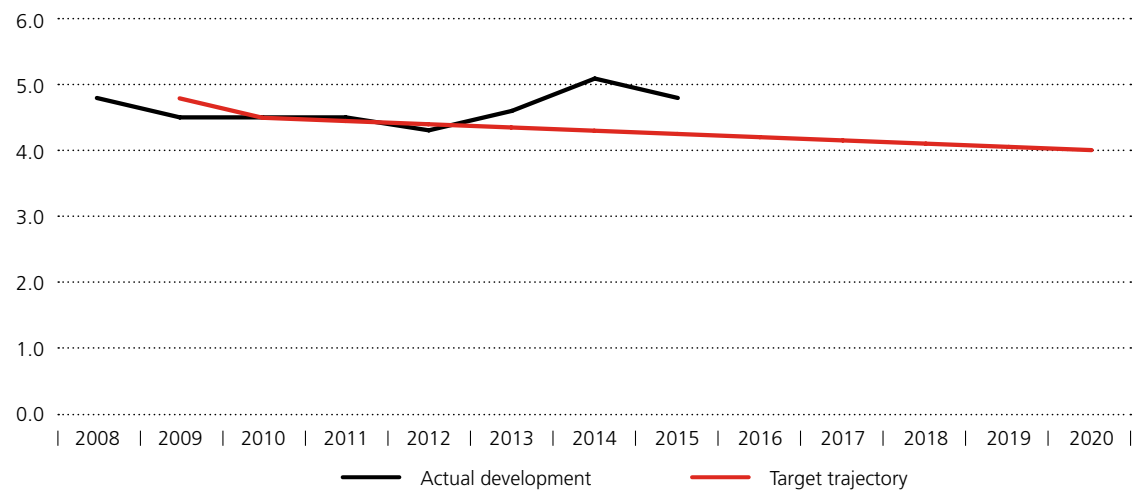
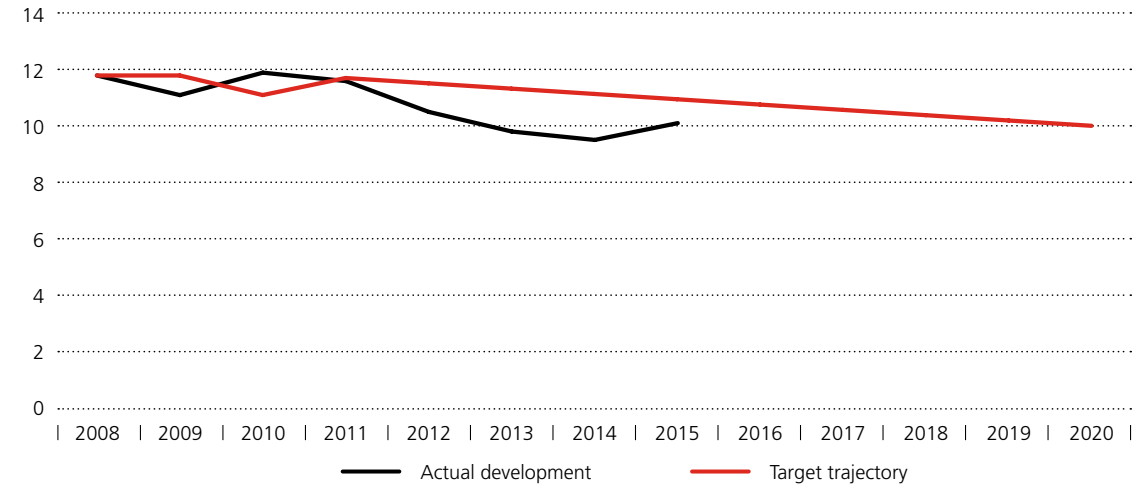


Figure 14
School-leavers without upper secondary qualifications and without further education/training (%)



7.4 ENVIRONMENTAL SUSTAINABILITY

In comparison with Dullien (2015) the indicator for the use of renewable energies was, as already discussed, was replaced by the national bird index, an indicator of biodiversity. This results in some changes with regard to the scorecard evaluation introduced in Dullien (2015) in this dimension. The environmental dimension of the scorecard is presented in Figures 15 and 16 for the years 2009 to 2015. As described in Dullien (2015) the coloured circles behind the individual indicators show whether the target for the indicator was achieved for the corresponding year (green means that the target was met, red that it was not). The upward or downward pointing arrows indicate whether the indicator improved or deteriorated relative to the target (arrow pointing upwards indicates an improvement, arrow pointing downwards indicates a deterioration).

Things are now substantially more negative in comparison with the original evaluation: while according to the old analysis from 2009 to 2013 – that is, in three years – the majority of indicators of environmental sustainability achieved their targets (see Dullien 2015), according to the new evaluation that still applies only to the crisis year 2009. In the years 2010 to 2015, by contrast, the majority of environmental sustainability targets were missed.

Figure 15
Environmental sustainability, 2009–2012

2009

Indicator	Value	Target value	Trend	Target met?
Greenhouse gas emissions (1990=100)	73.9	79.3	↑	●
Primary energy consumption (2008=100)	93.9	100.0	↑	●
Bird index (target 2015=100)	88.1	90.9	↓	●

2010

Indicator	Value	Target value	Trend	Target met?
Greenhouse gas emissions (1990=100)	76.6	73.9	↓	●
Primary energy consumption (2008=100)	98.5	93.9	↓	●
Bird index (target 2015=100)	84.3	92.4	↓	●

2011

Indicator	Value	Target value	Trend	Target met?
Greenhouse gas emissions (1990=100)	75.0	74.9	↑	●
Primary energy consumption (2008=100)	93.4	97.2	↑	●
Bird index (target 2015=100)	78.5	93.9	↓	●

2012

Indicator	Value	Target value	Trend	Target met?
Greenhouse gas emissions (1990=100)	75.5	73.3	↓	●
Primary energy consumption (2008=100)	94.2	96.0	↓	●
Bird index (target 2015=100)	82.6	95.5	↑	●

Figure 16
Environmental sustainability, 2013–2015

2013

Indicator	Value	Target value	Trend	Target met?
Greenhouse gas emissions (1990=100)	77.0	71.6	↓	●
Primary energy consumption (2008=100)	96.1	94.7	↓	●
Bird index (target 2015=100)	79.8	97.0	↓	●

2014

Indicator	Value	Target value	Trend	Target met?
Greenhouse gas emissions (1990=100)	73.3	70.0	↑	●
Primary energy consumption (2008=100)	92.6	93.5	↑	●
Bird index (target 2015=100)		98.5		●

2015

Indicator	Value	Target value	Trend	Target met?
Greenhouse gas emissions (1990=100)	73,8	68.3	↓	●
Primary energy consumption (2008=100)	93,6	92.2	↓	●
Bird index (target 2015=100)		100.0		●

The background to this evaluative shift is that the indicator of the proportion of renewable energies in energy consumption (an area in which Germany has developed well) was replaced by the index on the variety and distribution of bird species on agricultural land. As Figure 17 shows, no sustainable improvement has been achieved in the bird index since 2009. On the contrary, the bird index has in fact been trending downwards since 2008; only in 2012 was there a temporary rise. Current values of the bird index are not available for 2014 and 2015, although there is no evidence that the situation of birds on agricultural land in Germany is likely to have improved. Given the large gap between the bird index in 2013 and the target value in 2015 it can be excluded that the target value was achieved in 2014 or 2015.

Of the other two indicators of environmental sustainability only the indicator on primary energy consumption developed satisfactorily, at least by and large. Although over the period up to 2015 there were both falls and rises, in 2015, however, primary energy consumption was not too far from its target trajectory (see Figure 18). This development is particularly pleasing because economic growth in Germany in 2014 and 2015 overall – that is, not only in per capita or working hours terms, but also including the growing number of hours worked – did not turn out to be unduly weak and thus the decline in primary energy consumption is likely to have represented an increase in energy efficiency.

Greenhouse gas emissions, by contrast, developed considerably less favourably in Germany. As can be seen in Figure 19, the level of greenhouse gas emissions in 2015 was at a similar level to 2009, although a continuous reduction is provided for up to 2020. In contrast to 2014 in 2015 the gap with the target trajectory grew once again.

Figure 17
National bird index (target 2015 = 100)

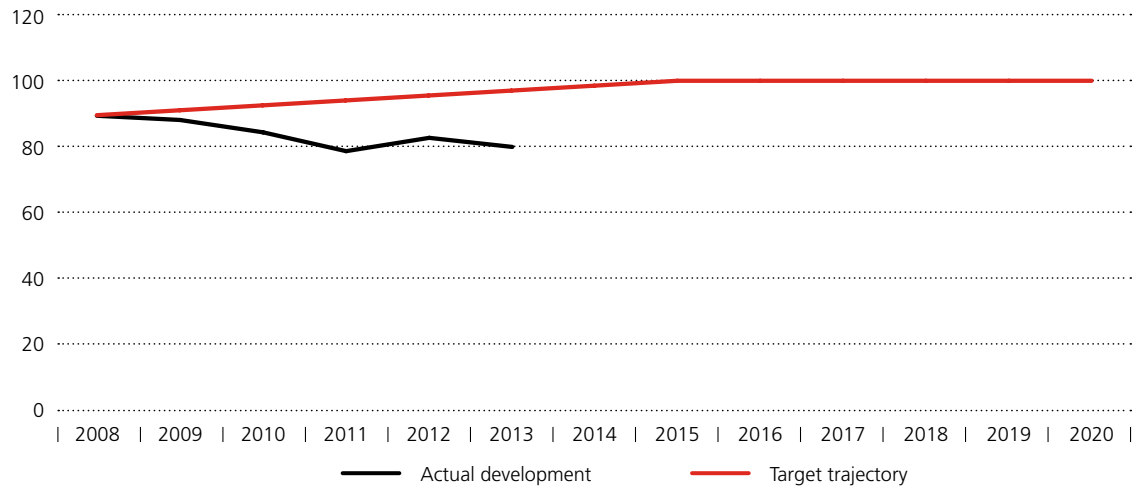


Figure 18
Primary energy consumption (2008 = 100)

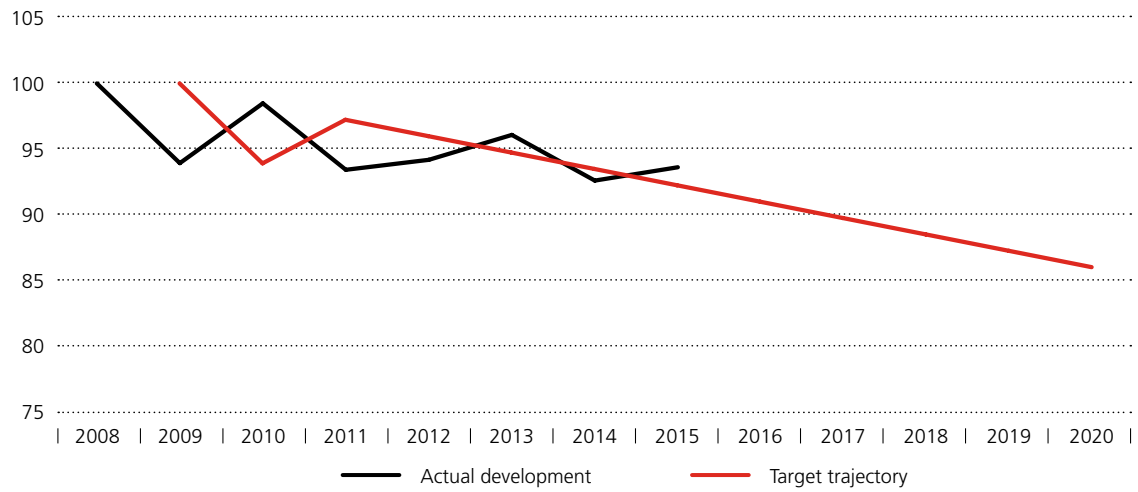


Figure 19
Greenhouse gas emissions (1990 = 100)

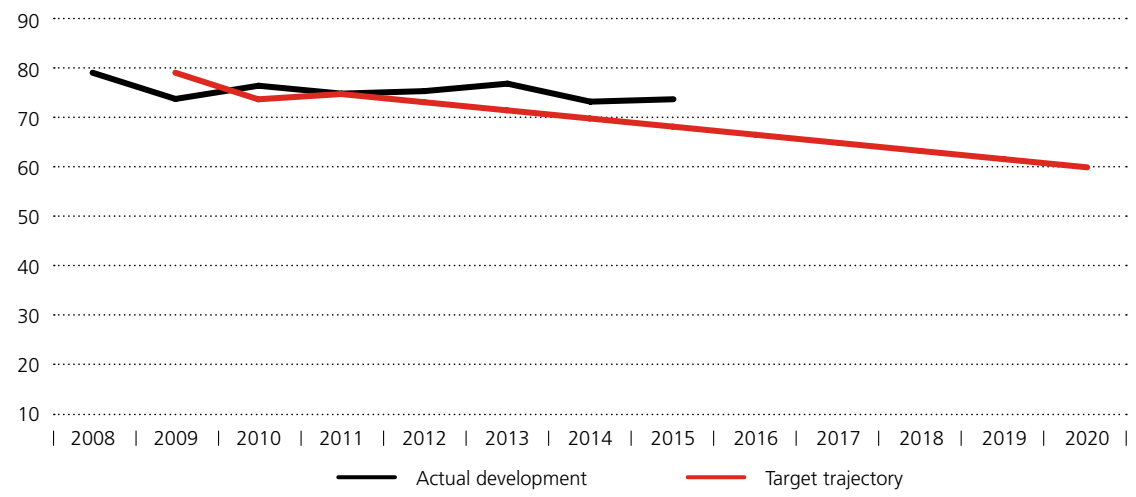


Figure 20
Scorecard 2014

2014

Material prosperity and economic sustainability

Indicator	Value	Target value	Trend	Target met?
GDP growth per capita and per working hour (% increase on previous year)	0.8	1.25	↑	●
Employment rate (%)	77.7	75.7	↑	●
Current account balance (% of GDP)	7.3	3.0	↓	●
Private and public consumption per capita (% increase on previous year)	0.5	1.25	↓	●

Sustainability of public sector activities and public sector finances

Indicator	Value	Target value	Trend	Target met?
General government budget balance (% of GDP, cyclically adjusted)	0.6	-0.5	↓	●
Public debt level (% of GDP)	74.9	77.9	↑	●
Public net investments (% of GDP)	-0.1	0.6	↓	●

Social sustainability

Indicator	Value	Target value	Trend	Target met?
At-risk-of-poverty rate (%, after transfers)	16.7	14.4	↓	●
Income quintile ratio (S80/S20)	5.1	4.3	↓	●
School-leavers without upper secondary qualifications (%)	9.5	11.1	↑	●

Environmental sustainability

Indicator	Value	Target value	Trend	Target met?
Greenhouse gas emissions (1990=100)	73.3	70.0	↑	●
Primary energy consumption (2008=100)	92.6	93.5	↑	●
Bird index (target 2015=100)		98.5		●

7.5 SUMMARY FOR 2014

Besides the analysis of the individual dimensions of sustainability Dullien (2015) also analysed economic development in each individual year (2009–2013). In this section and the two thereafter this analysis is expanded to the years 2014 to 2016.

For the year 2014 the set of indicators shows, despite an improvement in overall economic growth (+1.6 per cent as against +0.5 per cent in 2013), no major improvement of material prosperity and economic sustainability. The additional economic growth was due above all to the expansion of employment, GDP per capita (important for long-term development of prosperity) and per working hour, up 0.8 per cent, was much weaker than the target value. Private and public consumption per capita rose by only 0.5 per cent; it is thus quite a long way from the target of 1.25 per cent.

While the sustainability of public finances remained largely unchanged with slight cyclically adjusted budget surpluses and falling public debt ratio with continuing negative public net investments, social sustainability deteriorated. The proportion of the population at risk of poverty rose to 16.7 per cent and inequality, measured on the basis of the income quintile ratio S80/S20 grew.

In the case of environmental sustainability only primary energy consumption reached its target for 2014. Not only did primary energy consumption fall by annual comparison, but it also fell short of its target trajectory for 2014. No data were available for the bird index for 2014; the extent to which the target was not reached in the previous years, however, gives grounds to believe that the targets were also missed for 2014.

Overall, the set of indicators for 2014 thus presents the picture of a national economy that was catching up (2014 was the first year after the peak of the euro crisis in which the German economy had again grown by more than 1 per cent), but in which the fruits of the upturn were distributed very unevenly.

Figure 21
Scorecard 2015

2015

Material prosperity and economic sustainability

Indicator	Value	Target value	Trend	Target met?
GDP growth per capita and per working hour (% increase on previous year)	0.8	1.25	↑	●
Employment rate (%)	78.0	76.0	↑	●
Current account balance (% of GDP)	8.4	3.0	↓	●
Private and public consumption per capita (% increase on previous year)	1.3	1.25	↑	●

Sustainability of public sector activities and public sector finances

Indicator	Value	Target value	Trend	Target met?
General government budget balance (% of GDP, cyclically adjusted)	0.8	-0.5	↑	●
Public debt level (% of GDP)	71.2	76.8	↑	●
Public net investments (% of GDP)	-0.1	0.6	↑	●

Social sustainability

Indicator	Value	Target value	Trend	Target met?
At-risk-of-poverty rate (%, after transfers)	16.7	14.1	↓	●
Income quintile ratio (S80/S20)	4.8	4.3	↑	●
School-leavers without upper secondary qualifications (%)	10.1	11.0	↓	●

Environmental sustainability

Indicator	Value	Target value	Trend	Target met?
Greenhouse gas emissions (1990=100)	73.8	68.3	↓	●
Primary energy consumption (2008=100)	93.6	92.2	↓	●
Bird index (target 2015=100)		100.0		●

7.6 SUMMARY FOR 2015

For 2015 the set of indicators shows an improvement in material prosperity and economic sustainability, while the targets for social sustainability and environmental sustainability were largely missed. The sustainability of public finances and public sector activities remained largely unchanged, with a slight improvement in the debt level, slightly rising budget surpluses, but still much too low public net investments.

Private and public consumption per capita developed much better in the previous years, with 1.3 per cent increasing slightly more than envisaged for the target trajectory. Income distribution, measured on the basis of the income quintile ratio S80/S20, also improved, although it did not achieve its target trajectory. At the same time, the at-risk-of-poverty rate remained unchanged on the previous year (which given the target of a falling at-risk-of-poverty rate represents a deterioration in relation to the target trajectory).

The improvement in both consumption and income distribution can possibly be explained by the introduction of the nation-wide statutory minimum wage on 1 January 2015. According to current estimates one German in five works in the low wage sector; it is not implausible that a large proportion of these employees received wage increases as a result of the introduction of the minimum wage.

With accelerated economic growth in 2015 both primary energy consumption and the emission of greenhouse gases increased, so that both indicators missed their target trajectories. There are still no data for 2014 for the bird index 2015; as in the case of 2014, however, meeting the target is scarcely plausible given the observable trend up to 2013.

For 2015 the set of indicators thus presents the picture of an economy with slightly accelerated economic growth, in which income distribution improved slightly due to state interventions, but environmental sustainability deteriorated.

Figure 22
Scorecard 2016

2016

Material prosperity and economic sustainability

Indicator	Value	Target value	Trend	Target met?
GDP growth per capita and per working hour (% increase on previous year)	0.6	1.25	↓	●
Employment rate (%)		76.2		●
Current account balance (% of GDP)	8.6	3.0	↓	●
Private and public consumption per capita (% increase on previous year)	1.0	1.25	↓	●

Sustainability of public sector activities and public sector finances

Indicator	Value	Target value	Trend	Target met?
General government budget balance (% of GDP, cyclically adjusted)	0.4	-0.5	↓	●
Public debt level (% of GDP)	68.1	75.8	↑	●
Public net investments (% of GDP)	0.0	0.6	↑	●

Social sustainability

Indicator	Value	Target value	Trend	Target met?
At-risk-of-poverty rate (%, after transfers)		13.8		●
Income quintile ratio (S80/S20)		4.2		●
School-leavers without upper secondary qualifications (%)		10.8		●

Environmental sustainability

Indicator	Value	Target value	Trend	Target met?
Greenhouse gas emissions (1990=100)		66.6		●
Primary energy consumption (2008=100)		91.0		●
Bird index (target 2015=100)		100.0		●

7.7 FIRST TRENDS FOR 2016

For 2016 to date only a small part of the data needed for an evaluation in accordance with the new »magic square« is available. For example, there are already European Commission estimates on economic growth, consumption (both public and private), the budget balance and the debt level. There are no estimates for the employment rate or the indicators for social and environmental sustainability.

However, one can make plausible estimates for the unavailable indicators. The employment rate, given increased employment, is likely still to be high and the target trajectory achieved or even exceeded. Both the at-risk-of-poverty rate and income distribution would, despite a discernible improvement (for which there are no indications), again miss the target values. The rate of school-leavers without upper secondary qualifications, by contrast, would achieve the target value despite a deterioration (for which, again, there are no indications).

With regard to the emission of greenhouse gases and the national bird index again discernible improvements in 2016 would not lead to the achievement of the target trajectory. In the case of primary energy consumption achieving the target is conceivable, but it would require a very substantial reduction in energy consumption.

Figure 22 summarises target fulfilment for 2016 for the case that the employment rate, the at-risk-of-poverty rate, income distribution and the indicators of environmental sustainability have undergone no or only small changes. Thus, for 2016, despite a fairly robust GDP growth across the economy, the targets would scarcely be achieved, besides the sustainability of public finances, narrowly conceived (budget balance and debt level). Within the framework of the new »magic square« the conclusion would thus arise that a more substantial redirection of economic policy in Germany towards more social and environmental sustainability, as well as to more sustainability with regard to broader public sector activities (measured in terms of public investment activity), is called for.

8

CONCLUSIONS

It was already established in Dullien (2015), using the original set of indicators for the years 2009 to 2013, that the approach of the new »magic square« is in a position to depict macroeconomic development and economic policy measures plausibly in the four dimensions of sustainability. This has been confirmed in the present study, in which a slightly modified set of indicators is used in the wake of intensive discussions in workshops held by the Friedrich-Ebert-Stiftung and Denkwerk Demokratie and the period of investigation extended to 2014 and 2015, with a look at provisional data for 2016.

The replacement of the indicator »share of renewable energies in primary energy consumption« by the national bird index promises a broader evaluation of environmental sustainability than the set of indicators used in Dullien (2015). However, this replacement is also accompanied by certain disadvantages: the national bird index has not to date been regularly updated because it is compiled with the help of volunteers and not calculated in statistical offices. If the new »magic square« is really to become an instrument of economic governance the status of the national bird index has to be raised from that of a »semi-official« statistic to that of an official statistic with the data compiled, calculated and published by the statistical office Destatis. In addition, there is little evidence on the reliability of changes in the bird index from year to year. For that reason short-term fluctuations – as in the case of the other indicators – must be interpreted using the appropriate expertise and should not be evaluated purely mechanically.

The application to the German case implies that the framework could also be potentially interesting for other countries which wish to include the discussion of other dimension of well-being beyond the simple increase in GDP into their economic policy debate. While the Stability and Growth Law is a specifically German institution, at least the proposed reporting and monitoring system could be easily implemented in environments with different institutions.

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List of Abbreviations

GDP	Gross domestic product
EU	European Union
StabG	Stabilitäts- und Wachstumsgesetz (Stability and Growth Law)

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