# The German current account surplus through the lens of macroeconomic models

*For some time now, the German current account surplus has been the subject of intense discussion both at home and abroad. This article presents a number of model-based analyses that look at this topic. With regard to the long-term drivers of the German current account balance, it is revealed that demographic change in Germany is perceptibly fuelling long-term savings and thereby having a positive impact on the current account balance. The labour market reforms implemented in Germany in the early 2000s are also likely to have contributed to the rising current account balance. However, the recently very large surplus is attributable not only to structural factors. Macroeconomic models that explain short-term to medium-term deviations from long-term structural current account positions attribute the rise to a variety of influencing factors. These include increased domestic savings, particularly amongst enterprises. Although the subdued investment activity also played a role, it was less significant in quantitative terms. Furthermore, external factors, including heightened foreign demand for German products, were a key factor. Before the 2008 global financial and economic crisis, the surplus was growing mostly in trade with euro area countries. Thereafter, growth was driven by demand from countries outside Europe.*

*In addition, policy measures to reduce the current account surplus are examined using simulations featuring multiple macroeconomic models. It is shown that fiscal expansion in Germany would reduce the current account surplus. However, most of the models only point towards limited effects. While structural reforms in the German services sector would generally also lead to a reduction in the current account balance, their impact would be even less pronounced. The simulations suggest that changes in the international environment can have a significant impact. For example, an appreciation of the euro or an economic downturn in China would have a marked dampening effect on the German current account. In light of this, purely national measures on any plausible scale are unlikely to be sufficient to bring about a distinct reduction in the surplus. In order to reduce the surplus by any substantial degree, there would also have to be changes in the international environment. In the case of Germany, it is not obvious whether policy errors are to blame for the large surplus. For this reason, it is not constructive to introduce targeted measures to reduce the balance.*

*Nevertheless, fundamentally sensible and appropriate measures could also reduce the surplus. Against the backdrop of the coronavirus pandemic, the Bundesbank's current forecast estimates a considerable decrease in the German current account surplus from more than 7% to less than 5% of gross domestic product this year. According to the projections, the surplus will not exceed the 6% threshold of the EU imbalance procedure again before the end of 2022. Although the model scenarios did not simulate the COVID-19 shock, these projections are generally consistent with the model simulations. For example, global economic output weakened significantly as a result of the pandemic, international trade collapsed, Chinese economic growth slowed considerably, and German fiscal policy switched to a highly expansionary path in order to tackle the fallout of the pandemic.*

# ▪ Introduction

For the German economy, current account surpluses are more the rule than the exception. One special case was the years following German reunification: the current account was in deficit and its balance fluctuated around -2% of gross domestic product (GDP) over the next ten years. This led to net external assets being almost completely exhausted. The current account balance then bounced back into positive territory; the surplus subsequently saw strong growth. Before the 2008 financial and economic crisis, it reached 7%. The global crisis interrupted this trend for just a short while. As early as 2015, the surplus widened to more than 8% and did not come down much until the outbreak of the coronavirus pandemic. This led to discussions both at home and abroad. In many other countries, there have been significant adjustments to current account balances over the past two decades. Current account imbalances, which had still been under intense discussion before the 2008 global financial and economic crisis, narrowed considerably (see the box on pp. 21-24). However, the German current account surplus remained at a high level until recently. Furthermore, it is difficult to explain on the basis of fundamentals.[1]

Against this backdrop, the German current account surplus has been repeatedly criticised by organisations such as the IMF and the European Commission, which both called for fiscal and economic policy measures to reduce the surplus. These included more expansionary fiscal policy and structural reforms in the services sector.[2] In response, the German Federal Government argued that the current account balance was difficult to control as a variable because it reflected a range of economic decision-making processes at the micro level both in Germany and abroad.[3] In addition, there were no known major policy errors in Germany that could have explained the high surpluses. Finally, there was insufficient evidence for the efficacy of the proposed measures in reducing the surplus.

Answers to such questions cannot be found solely by describing the development of the current account or domestic saving and investment. However, this is a sensible starting point for more in-depth analyses. Ultimately, the driving forces behind the current account surplus and the efficacy of policy measures can only be identified and analysed within a consistent macroeconomic framework. Such a framework can be provided by macroeconomic models. They present a simplified depiction of complex economic relationships. This reduction in complexity allows for a greater focus to be placed on the relationships that are of particular interest in each case. This is especially helpful when analysing the current account balance, as it is the result of a multitude of economic decisions and policy measures both at home and abroad. The current account balance is therefore a highly endogenous variable within an intricate network of macroeconomic interrelationships. However, the necessary reduction in complexity in the models comes at a cost: all of the potentially relevant aspects can no longer be equally represented. For this reason, the Bundesbank's toolset for macroeconomic analyses includes a variety of models in order to take account of the widest possible range of potentially relevant factors and to take advantage of the relative benefits of each individual model type.

This article will begin by describing the development of the German current account over the past three decades. Then, it will present the results of an analysis on the driving forces behind the current account. This will be followed by an investigation into the possible impact of demographic trends and labour market reforms. Lastly, the outcomes of selected policy

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**1** See, for example, International Monetary Fund (2019) and European Commission (2020). In its External Sector Report, the International Monetary Fund (IMF) estimates that the German current account surplus exhibits a positive deviation of around 4½% of GDP over its value according to the underlying fundamentals.
**2** For more information on the regulation of professional services in Germany, see Deutsche Bundesbank (2019a).
**3** See Federal Ministry of Finance (2017).

# The evolution of global current account balances

Time and again, the international debate shines a spotlight on current account balances. This was notably the case in the mid-2000s, when current account surpluses and deficits in relation to gross domestic product (GDP) rose sharply in many countries, reaching considerable heights in some instances. However, surpluses or deficits in the current account are not problematic per se. Current account deficits give developing and emerging market economies the opportunity to accelerate the pace of catch-up by taking on higher external debt. Conversely, current account surpluses enable advanced economies to invest assets abroad. In this respect, differences in current account positions can be an expression of rational asset decisions. However, high negative and potentially unsustainable balances risk giving rise to abrupt adjustments and subsequent economic crises.

In general, current account imbalances have become less important in recent years.[1] In 2018-19, the weighted average current account balance amounted to 3¼% of GDP for surplus countries and to 2½% of GDP for deficit countries.[2] Prior to the global financial crisis, in 2006-07, the figure had stood at 7% and 4½%, respectively. This observation is also backed up by an analysis of unweighted balances, which places greater emphasis on developments in smaller economies.[3] In the same vein, particularly pronounced deficits are shown to have decreased significantly.[4]

The scale of the adjustment varied quite considerably within the individual groups of countries. The surpluses of emerging market economies contracted to a much greater extent than those of industrial countries. Declining commodity prices had a major part to play in this. By contrast, deficits were reduced only slowly in recent years, unlike in the group of industrial countries.[5] However, particularly high deficits that could be considered unsustainable, as were widespread prior to the global financial crisis, also decreased markedly amongst emerging market economies.[6]

Looking at individual countries and regions, the discussion has focused time and again on the current account deficit of the United States. Up until the mid-2000s, its deficit steadily expanded to almost 6% of GDP. This development was attributed, amongst other things, to the role of the United States as a major recipient of rapidly expanding

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1 The analysis included the 70 most economically important countries, as measured by purchasing power adjusted GDP in 2019, plus seven smaller euro area countries. Together, they account for more than 95% of global GDP. The data were taken from the World Economic Outlook published by the International Monetary Fund (IMF) in April 2020.
2 GDP adjusted for purchasing power is used to weight national current account balances.
3 Unweighted average deficits have decreased since the mid-2000s from just over 6% to 3% most recently. Over the same period, average surpluses fell from just under 9% to 5½%.
4 In the mid-2000s, the unweighted average current account balance of the five countries with the largest surpluses stood at around 27% of GDP; at last count, it amounted to 12½%. The average deficit of the five countries with the largest deficits decreased from 15% to 7%.
5 The divergent courses taken by the surpluses and deficits of industrial and emerging market economies in recent years are also likely to mirror changes in price competitiveness. In the wake of the global financial crisis, the Chinese currency appreciated distinctly in real terms against a broad range of trading partners' currencies, which was also reflected in a deterioration in China's price competitiveness, amongst other things. This facilitated a narrowing of the current account surplus. The currencies of major industrial regions, such as those of the euro area and Japan, tended to depreciate in real terms over the same period, making it difficult to reduce current account surpluses. See International Monetary Fund (2019).
6 The average deficit of the three countries with the largest deficits among the emerging market economies was still 9½% in 2007 but had shrunk to just 6¾% by 2019.

## Current account balances of selected economies and groups of countries

As a percentage of national GDP[1]
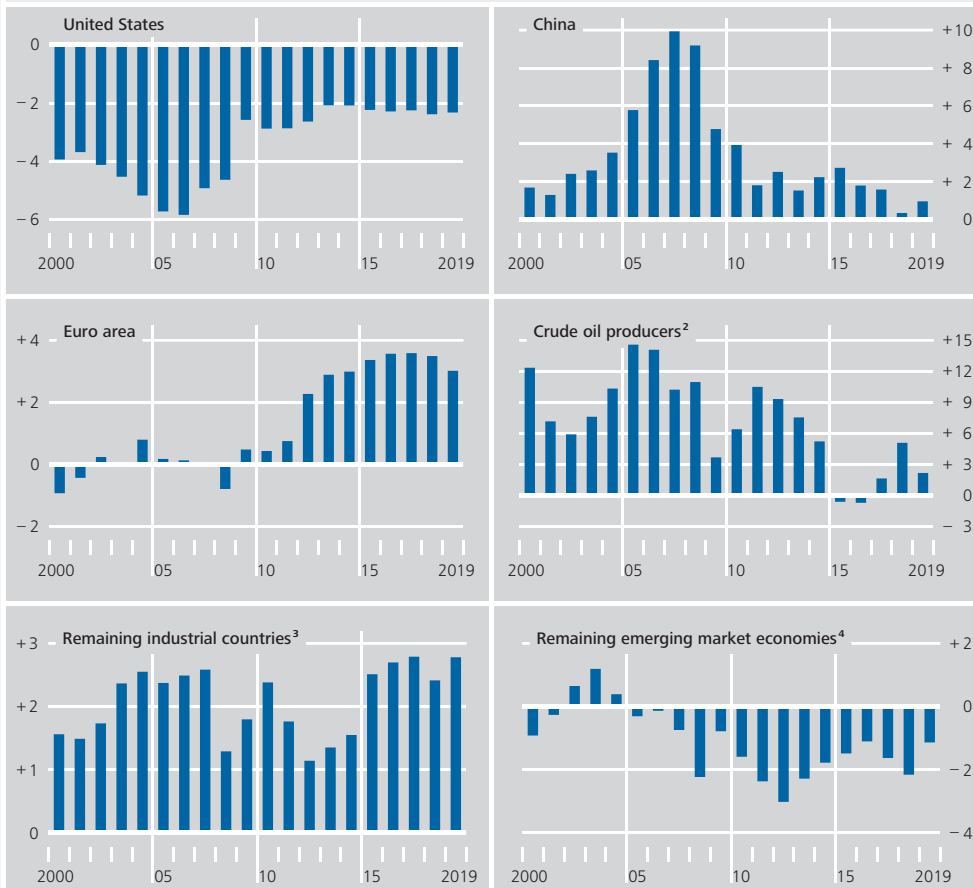


Sources: IMF World Economic Outlook, April 2020, and Bundesbank calculations. **1** For groups of countries, the average of those countries is shown, weighted by purchasing power adjusted GDP. **2** Algeria, Angola, Ecuador, Iran, Kazakhstan, Kuwait, Nigeria, Norway, Oman, Qatar, Russia, Saudi Arabia, United Arab Emirates and Venezuela. **3** Australia, Canada, Czech Republic, Denmark, Hong Kong, Israel, Japan, New Zealand, Singapore, South Korea, Sweden, Switzerland, Taiwan and United Kingdom. **4** Argentina, Bangladesh, Brazil, Chile, Colombia, Dominican Republic, Egypt, Ethiopia, Ghana, Hungary, India, Indonesia, Malaysia, Mexico, Morocco, Myanmar, Pakistan, Peru, Philippines, Poland, Romania, South Africa, Sri Lanka, Thailand, Turkey, Ukraine, Uzbekistan and Vietnam.

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global savings at that time.[7] Following the considerable contraction of the current account deficit during the financial and economic crisis, it stabilised at around 2½% of GDP in the 2010s and has not declined any further since 2018 despite far-reaching trade policy measures taken by the US Administration.[8,9]

The euro area countries, in particular, contributed to the decline in global deficits. In the course of increased economic integration, some economies had built up current account deficits – some of which were sig-

**7** See Bernanke (2005) as well as Hoffmann et al. (2019).

**8** For an overview of the measures and their consequences, see Deutsche Bundesbank (2020a). Starting in 2018, the United States' highly expansionary fiscal stance in the wake of the country's tax reform probably also made it more difficult to further narrow its current account deficit (see Deutsche Bundesbank (2018a)).

**9** The United States' special role with regard to global risk sharing probably goes some way towards explaining its persistent current account deficit. The bulk of its external assets consist of relatively risky assets such as equities, while most of its external debt is made up of US dollar-denominated and fixed-rate bonds. In normal times, the United States thus generates positive risk premia, which is why its persistent negative net external position is also likely to be sustainable to some extent (see Gourinchas et al. (2017)).

nificant – by 2008.[10] These were deemed unsustainable by the markets and led to capital outflows from the countries concerned. Owing to the massive damper on domestic demand resulting from the global financial and economic crisis, the deficits decreased significantly. This continued in many countries even after the European sovereign debt crisis had come to an end.[11] In addition, the marked nominal and real effective depreciation of the euro and the associated increase in the euro area countries' price competitiveness helped improve their current account balances.[12] The current account balances of Spain and Italy even moved perceptibly into positive territory, as did that of the euro area as a whole.

One surplus country to attract significant attention is China, whose current account balance has experienced major ups and downs since the 2000s. Owing to the Chinese economy's longstanding export-led growth model, the current account surplus as a percentage of GDP increased from around 1½% to almost 10% between 2000 and 2007. However, this surplus trended significantly downwards in the wake of the global financial and economic crisis. Indeed, most recently, the current account was almost balanced. A key factor in this is likely to have been that Chinese exporters' sales potential on the global markets has been largely exhausted and economic growth has increasingly shifted to the domestic economy.[13,14]

By contrast, surplus positions narrowed very little in most industrial countries. Prior to the outbreak of the current crisis, the Netherlands and Germany continued to run high surpluses. Outside the euro area, the same was true for Denmark, Taiwan and Switzerland, amongst others. Japan and South Korea were likewise running persistent, albeit not so pronounced, surpluses. This was due to export-promoting factors such as their role in regional production networks, a high degree of competitiveness in some cases and global demand for certain country-specific products.[15,16] Other likely important factors were population ageing and accumulated external assets, the income from which contributed to the surpluses. Estimates in the IMF's External Balance Assessment indicate that the surpluses of Japan and South Korea, for example, can be explained quite readily in this way. The same cannot be said for the pronounced balances in Germany, the Netherlands and Switzerland.[17]

As a result of the massive turmoil set in motion by the coronavirus pandemic, there could be quite significant adjustments to current account balances worldwide this year – much like there were in the wake of the 2008-09 global financial and economic crisis. A significant adjustment is on the horizon in oil-exporting countries owing to

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**10** In 2008, the current account deficit in Greece stood at around 14% of GDP, while Portugal's amounted to almost 12%, Spain's to 9% and Ireland's to roughly 6%.

**11** See also European Central Bank (2017).

**12** The aforementioned nominal effective depreciation of the euro in the aftermath of the European sovereign debt crisis also improved Germany's price competitiveness. This probably contributed, inter alia, to the growth in Germany's current account surpluses up to 2015 as well.

**13** See Deutsche Bundesbank (2018b).

**14** Additionally, the sharp growth in imports of travel services as a result of booming Chinese overseas tourism is also having a dampening effect. See Deutsche Bundesbank (2015a).

**15** See Deutsche Bundesbank (2015b).

**16** In this context, another reason is that trade barriers for goods are much lower than for services. For example, one former governor of the Bank of England argued that countries with comparative cost advantages in trade in services, such as the United States and the United Kingdom, would tend to generate deficits owing to this asymmetry, while goods exporters such as Germany and China would tend to run surpluses (see Carney (2017)). However, the extent to which such asymmetries actually matter is disputed (see Boz et al. (2018)).

**17** See International Monetary Fund (2019).

the slump in the crude oil price.[18] Economies that generate substantial revenue from travel services under normal circumstances will also suffer considerable losses. In view of the major setback to the international trade in goods, the same applies to countries specialising in the export of industrial goods. The groups of countries affected include both economies with current account surpluses in recent years and those with deficit positions. Overall, however, there is likely to be a marked narrowing of surpluses and deficits. The risk of abrupt corrections associated with the adjustment appears to be lower than during the global financial and economic crisis, not least because of the improved starting position.

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[18] The IMF expects Saudi Arabia, Norway, Nigeria and Iran, for example, to run deficits in 2020. See International Monetary Fund (2020).

scenarios from simulations featuring up to seven macroeconomic models will be discussed. An overview of the models used in the analysis can be found in the box on pp. 27-29. The scenarios examined cover fiscal policy measures in Germany, structural reforms through the liberalisation of the goods market, as well as certain changes on the part of key trading partners, including a sharp downturn in growth momentum in the Chinese economy.

## Development of the German current account

*A long history of current account surpluses*

In recent decades, the German current account has recorded surpluses with very few exceptions.[4] Only in the 1990s was there a longer period of negative balances as a result of German reunification (see the chart on p. 25).[5] This phase came to an end at the turn of the millennium, with the current account surplus growing to 8½% of GDP by 2015. Since then, the

surplus has seen a slight decline; however, last year, it still amounted to more than 7% and therefore remained above the 6% threshold value stipulated by the European Commission's procedure for preventing and correcting macroeconomic imbalances. Among the sub-accounts of the current account, the trade balance made the largest contribution to the positive balance. During the period of persistent current account surpluses, however, the net external position also saw strong growth. As a consequence, cross-border flows of investment income made up an increasingly significant portion of the total current account surplus.
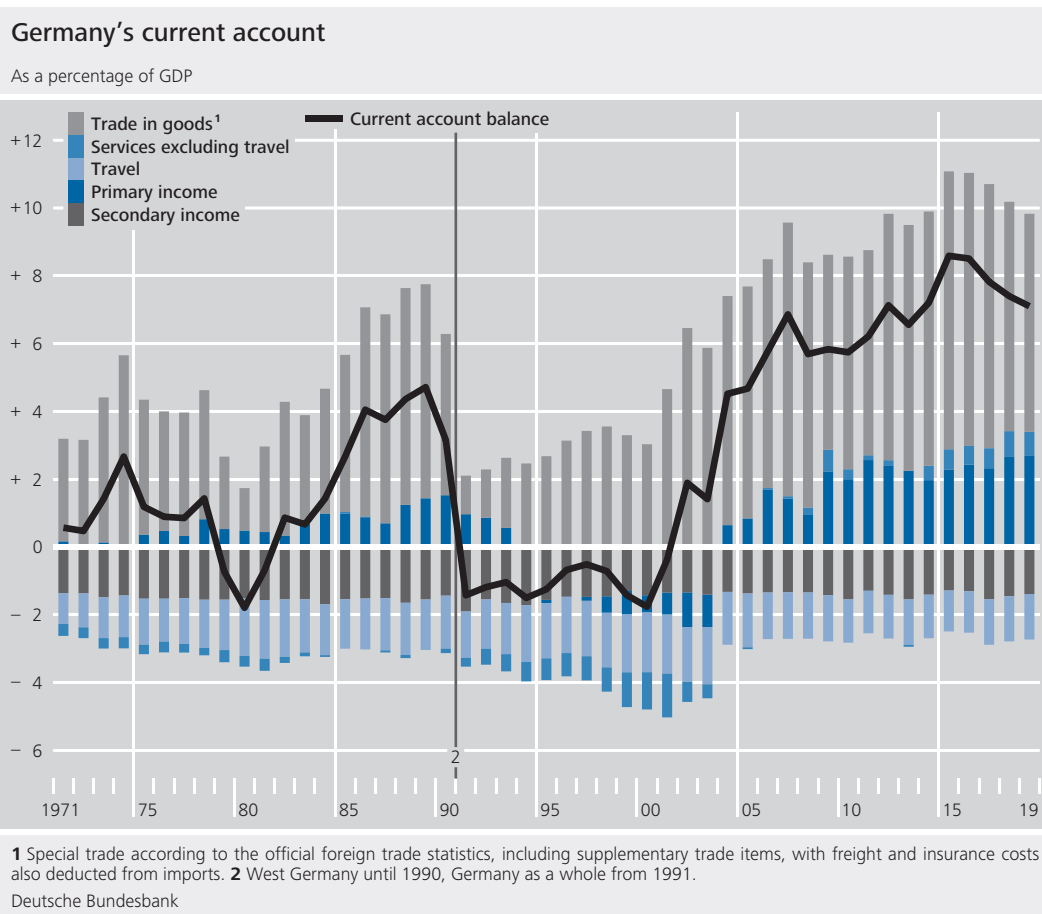
The current account balance is a nominal variable that is affected by price and volume effects. The widening of the surplus after the

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[4] In March of each year, the Bundesbank provides a detailed report on the developments in the balance of payments. See, for example, Deutsche Bundesbank (2020b).
[5] For more information, see also Deutsche Bundesbank (2020c).

## Germany's current account

As a percentage of GDP



**1** Special trade according to the official foreign trade statistics, including supplementary trade items, with freight and insurance costs also deducted from imports. **2** West Germany until 1990, Germany as a whole from 1991.

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turn of the millennium could, up until the 2008 global financial and economic crisis, largely be explained by the strong quantitative growth in exports. For the period from 2011 to 2015, this does not apply to the same extent; during this time, price effects played a key role.

*Marked shifts in regional distribution of surpluses*

When looking at the development of the current account balance in regional terms, marked differences over time can be observed: up until 2008, the surplus with euro area countries increased sharply – particularly with those that were hit especially hard by the subsequent debt crisis. Since then, the surpluses with those countries have almost completely disappeared. After 2011, surpluses grew particularly with countries outside of the euro area, above all with Asian and American countries (see the upper chart on p. 26).

*Rise in saving*

Looking at the current account through the lens of macroeconomic saving and investment, the rise in the current account balance over the

past 20 years was due to both the increase in savings relative to GDP as well as to the decrease in net investment (also in relation to GDP). In this context, with the exception of the years 2000 and 2001, the higher savings play a quantitatively more significant role. In terms of the various sectors, households exhibited increasing saving up until 2008. Their contribution remained more or less unchanged thereafter. A noteworthy shift occurred in saving among non-financial corporations: starting from a position of deficit, this sector has now almost consistently recorded positive net lending/net borrowing for the last 20 years. And finally, public sector budgets have contributed to the rise in macroeconomic saving since the financial crisis through their turnaround from general government deficits to surpluses (see the lower chart on p. 26).

Reflecting the not only persistent, but also increased current account surplus, Germany's net external position has expanded considerably in

*Strong growth in net external assets*

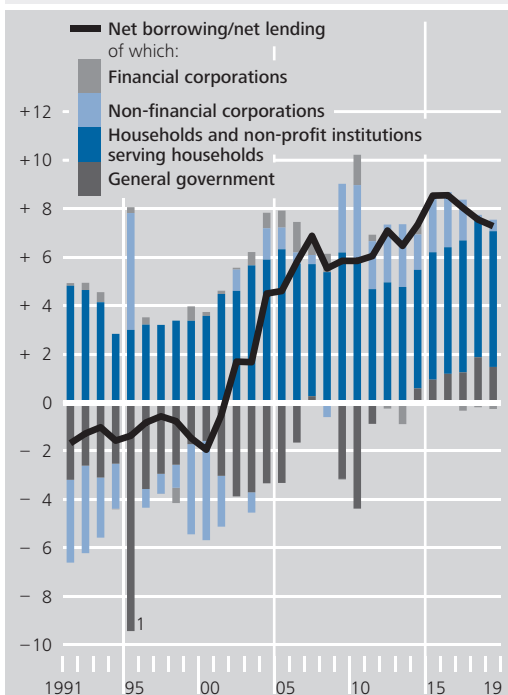## Germany's current account by country and region

As a percentage of GDP
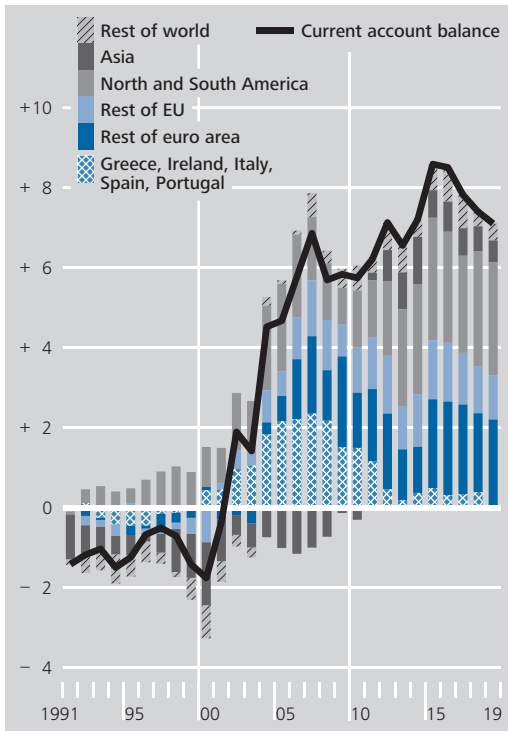


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## Germany's net borrowing/net lending by sector

As a percentage of GDP



**1** One-off effect caused mainly by assumption of Treuhand debt by general government.

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recent years. Beginning from an almost balanced position, net external assets have risen to more than 70% of GDP over the past two decades as a result of the continued current account surpluses.

## A model-based explanation of the driving forces behind the German current account surplus

*Requirements for macroeconomic models for analysing the current account*

Describing the development of the German current account points towards possible driving forces, but ultimately cannot explain them. This can only be achieved within a consistent theoretical framework. Such a framework can be provided by economic models. Models used to analyse the current account should fulfil a number of requirements: they should capture saving and investment behaviour in detail. In this context, it would be beneficial if long-term structural changes in saving behaviour could also be modelled, as these changes explain long-term changes in the net external position and the current account. In addition, it would be desirable for the model to have a multi-country structure that covers the major global economic players and Germany's trading partners. A differentiation between the tradable and non-tradable goods sectors would allow for additional insight. Finally, it should also be possible to examine a variety of fiscal and economic policy measures. However, it is difficult for a single model to fulfil all of these criteria. For this reason, a number of different models are employed to analyse the development of the current account. The following sections of this article present a range of models that the Bundesbank uses for policy analyses. The box on pp. 27-29 provides a description of the key models and their characteristics.

*A model-based analysis of factors driving the German current account balance*

To start off, the key driving forces behind the German current account balance since the year 2000 are examined from the perspective of the Bundesbank DSGE model. This model was developed by the Bundesbank's Research Centre

# Macroeconomic models for analysing the German current account surplus

The Bundesbank uses a wide range of macroeconomic models for policy analysis. These models can be divided broadly into two categories. First, semi-structural models are a standard tool for macroeconomic projections and simulations. Second, these more traditional models have been supplemented in recent years by dynamic stochastic general equilibrium (DSGE) models.

Semi-structural models depict macroeconomic relationships within a macroeconomic theoretical framework. However, they are less strongly rooted in theory and instead primarily achieve a high degree of consistency with the empirical observations. This means that they tend to be easier to expand and are therefore often more comprehensive than DSGE models. The latter display strong micro-foundations of the decisions made by economic agents. They are typically based on an assumption made by a representative economic agent that assumes an infinite time horizon when making its economic decisions. This is why forward-looking expectations play a greater role in these models than in semi-structural models.

DSGE models, in particular, are designed for short to medium-term analyses. Their main purpose is to study the adjustment processes of the economy towards a long-term equilibrium. However, the models leave parts of this long-term economic equilibrium undetermined; these are specified exogenously. This has important implications for the analysis of current account balances using these models, as this long-term equilibrium also generally includes the net external asset position. As the net external asset position is a result of developments in the current account balances, it is thus only possible for the current account to deviate from its exogenous equilibrium in the short to medium term.[1] Structural changes in current account balances are virtually impossible to model in standard DSGE models. However, such shifts in current account equilibria are self-evident, owing to a permanent change in saving behaviour, for example. Model extensions, such as the inclusion of saving for old-age provision or precautionary saving against the risk of involuntary unemployment, allow for longer-term adjustment processes to be analysed, too. One model class commonly used in this context is that of overlapping generation models (OLGs).[2]

The analyses described in this article are carried out using models covering all three of the described classes. In concrete terms, up to seven models for policy simulations are analysed:

– EAGLE: Euro Area and Global Economy Model (Gomes et al. (2012));

– FzBBKM: Forschungszentrum Bundesbank Multicountry Model (Hoffmann et al. (2020));

– FiMod: Fiscal Policy Model (Stähler and Thomas (2012));

– FiModOLG: Fiscal policy model with OLG structure (Ruppert and Stähler (2020));

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**1** From a technical point of view, the exogeneity of the net external position is necessary in order to make the long-term model equilibrium – the "steady state" – determinable. This is a prerequisite for solving such models.
**2** For a detailed discussion of the problem, see, inter alia, Ghironi (2008), Di Giogio and Nisticò (2013), and Oxborrow and Turnovsky (2017).

## Key characteristics of the macroeconomic models used for the simulations*

| Characteristic | EAGLE | FzBBKM | FiMod | FiModOLG | GEAR | NiGEM | MEM |
|---|---|---|---|---|---|---|---|
| Model type | DSGE | DSGE | DSGE | Life-cycle DSGE | DSGE | Semi-structural | Semi-structural |
| Expectations formation | Forward-looking | Forward-looking | Forward-looking | Forward-looking | Forward-looking | Forward-looking (partial) | Backward-looking |
| Frequency | Quarterly | Quarterly | Quarterly | Annual | Quarterly | Quarterly | Quarterly |
| Parameterisation | Calibrated | Estimated | Calibrated | Calibrated | Estimated | Estimated | Estimated |
| Regions | 4 | 3 | 2 | 3 | 3 (2+VAR) | > 49 | 1 |
| Tradable/ non-tradable goods | Yes | Yes | No | No | No | No | No |
| Banking sector | No | No | No | No | No | No | No |
| Financial accelerator | No | No | No | No | No | No | No |
| Unemployment | No | No | Yes | Yes | Yes | Yes | Yes |
| Fiscal policy | Fiscal rule | Balanced budget | Fiscal rule | Fiscal rule | Fiscal rule | Fiscal rule | Fiscal rule |
| Monetary policy | Endogenous | Endogenous | Endogenous | Endogenous | Endogenous | Endogenous | Exogenous |
| Exchange rate | UIP | UIP | UIP | UIP | UIP | UIP | Exogenous |
| Export prices | LCP | PCP | PCP | PCP | PCP | LCP | PCP, PTM |
| Import prices | LCP | PCP | PCP | PCP | PCP | PCP | PCP, PTM |
| Import content of exports | Yes | No | No | No | No | Yes | Yes |
| Import content of private spending | Yes | Yes | Yes | Yes | Yes | Yes | Yes |
| Import content of government spending | Yes | Yes | No | No | No | Yes | Yes |

**\*** UIP refers to "uncovered interest rate parity". LCP and PCP refer to "local currency pricing" and "producer currency pricing" respectively, while PTM refers to "pricing to market".

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– GEAR: Germany in the Euro Area Model (Gadatsch et al. (2016a));

– NiGEM: National Institute Global Econometric Model (https://nimodel.niesr.ac.uk);

– MEM: Macroeconometric Model of the Bundesbank (Deutsche Bundesbank (2019b, 2019c)).

In addition to these models, there is also a comprehensive OLG model for modelling demographic developments and a model for incorporating a motive of precautionary saving against the risk of involuntary unemployment (see the box on p. 32). These latter two models (as well as FiModOLG) are suitable for endogenously determining the long-term equilibrium of the economy.

The other DSGE models attribute adjustments in the current account to its long-term exogenous equilibrium.

The models used cover a wide range of modelling structures and purposes. NiGEM and MEM belong to the class of semi-structural macroeconometric models. EAGLE, FzBBKM, FiMod and GEAR are DSGE models. FiModOLG is an extension of the FiMod model that allows for permanent shifts in the net external position due to its inclusion of overlapping generations.[3]

Calibrated by Eurosystem experts, the EAGLE model is a multi-country model that

**3** The implementation of the OLG structure follows the approach of Blanchard (1985) and Yaari (1965).

can analyse adjustment processes both within and outside of the euro area. FzBBKM is a three-country model that focuses on analysing the German economy. NiGEM is a comprehensive multi-country model of the National Institute of Economic and Social Research (NIESR), which is regularly used at the Bundesbank for analysing policy measures in an international context. MEM is the macroeconometric model of the Bundesbank. It serves as the basic model for the semi-annual projections for Germany's economy,[4] and is also regularly used for policy analyses. Like FzBBKM, both FiMod and FiModOLG have a multi-country structure and – similarly to GEAR – have been developed primarily for analyses in the areas of fiscal policy and the labour market.[5] The table on p. 28 provides an overview of the main characteristics of the models used.

The four DSGE models (FzBBKM, EAGLE, GEAR and FiMod) form a closely related family of models, as they all operate under forward-looking expectations. In the two semi-structural macroeconometric models, forward-looking expectations play a smaller role (NiGEM) or no role at all (MEM). The adjustments therefore tend to be more gradual in these models than in DSGE models. FiModOLG is the only one of the seven models that allows long-term saving to be determined endogenously.

Except for MEM, all seven are multi-country models in which other countries or regions of the world are explicitly modelled. This means that cross-border spillovers are determined endogenously within the model. FzBBKM and EAGLE allow for two sectors to be analysed, namely those of tradable and non-tradable goods. The other models include only one production sector. Ultimately, various fiscal policy options are well represented in all of the models, with only

FzBBKM having a rather rudimentary structure in this regard. For example, public investment in EAGLE, GEAR, FiMod, FiModOLG and NiGEM is not only an element of aggregate demand, but also an important input factor in the production process. This allows the supply effects of government investment expenditure to be captured, too.[6]
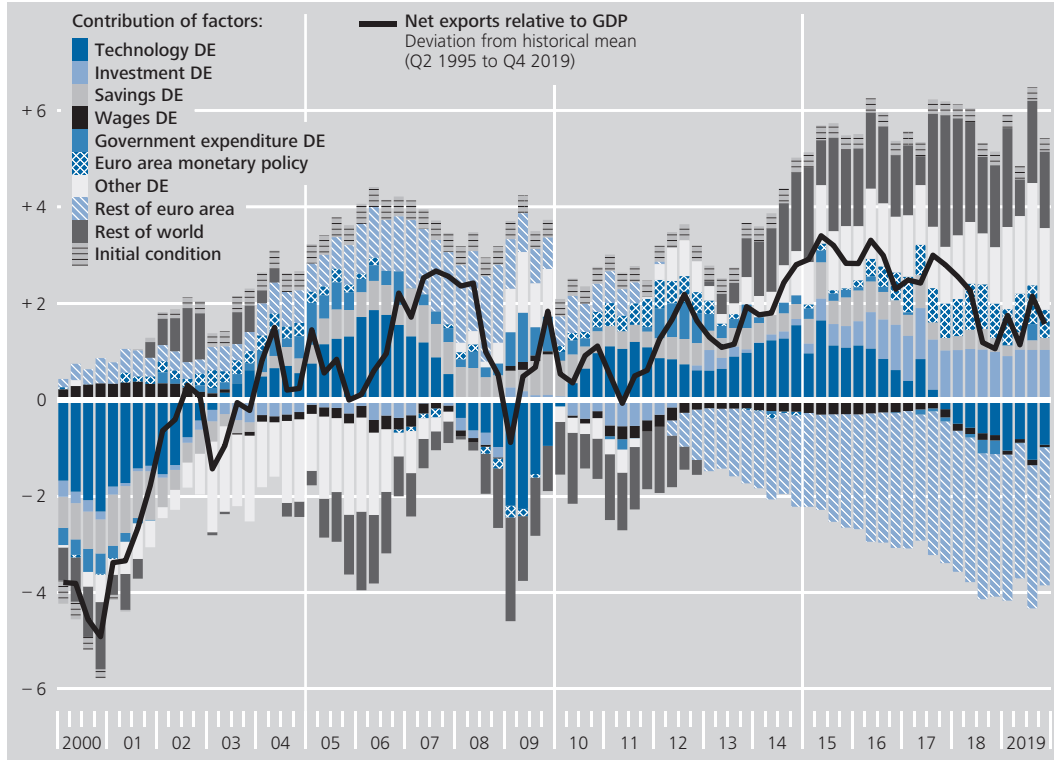
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**4** For the most recent projection, see Deutsche Bundesbank (2020d).
**5** See also Gadatsch et al. (2016b).
**6** For a more detailed comparison of the models, see also Deutsche Bundesbank (2020e).

## Shock decomposition of German net exports

In percentage points



Contribution of factors:
- Technology DE
- Investment DE
- Savings DE
- Wages DE
- Government expenditure DE
- Euro area monetary policy
- Other DE
- Rest of euro area
- Rest of world
- Initial condition

Net exports relative to GDP
Deviation from historical mean
(Q2 1995 to Q4 2019)

Deutsche Bundesbank

and has since been employed for policy analyses (FzBBKM; see the box on pp. 27-29).[6] It is one of the larger-scale DSGE models used at the Bundesbank. The model contains three regions (Germany, the euro area excluding Germany and the rest of the world) and allows tradable and non-tradable goods to be differentiated.[7] The analysis focuses on net exports (i.e. the trade surplus), as it is this part of the current account that is – as already established – a significant factor in current account balance developments in Germany.[8]

*In DSGE models, a shock decomposition can explain developments in endogenous model variables*

In a DSGE model, the endogenous variables – the variables determined by the model itself – are determined by two things: through the interaction between the endogenous variables themselves, and through exogenous, unforeseeable processes, known as shocks. Each deviation of a model-endogenous variable from its equilibrium can be attributed to the contributions of the underlying shocks. The same applies to trade surpluses. The results of such a

shock decomposition in the Bundesbank DSGE model are presented below.

These model-based shock decompositions should always be interpreted with a certain level of caution, however. If a model is (suffi-

*Limits of DSGE models*

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**6** See Deutsche Bundesbank (2019d). For a detailed and up-to-date description of the model, see Hoffmann et al. (2020).

**7** It was estimated on a quarterly basis for the period from 1995 to 2017 using Bayesian methods. The model contains a wide range of structural shocks. In order to make the results easier to interpret, the shocks were classified into nine different groups of shocks to explain developments in the trade surplus. For Germany, these shocks relate to the areas of technology, saving, investment, government spending, wages and residual shocks (these also include shifts between the sectors of tradable goods and non-tradable goods, and in the profit margins). To these are added monetary policy shocks in the euro area and combined shocks in the rest of the euro area and the rest of the world. The model does not include an exchange rate shock.

**8** It is generally also possible to extract the current account balance from the model. That said, trade surpluses were used for the model estimation, which means that the model-implied current account balances do not necessarily match the corresponding figures from official statistics. This is why the shock decomposition was only carried out for trade surpluses.

ciently strongly) misspecified, the shocks may not measure the underlying economic determinants. Furthermore, DSGE models, initially designed for business cycle analysis, only depict cyclical deviations of macroeconomic variables and developments from one particular equilibrium value. Its explanatory power thus refers exclusively to such deviations. This means that such analyses cannot explain structural components of the German current account surplus. This does not, however, render these models obsolete in current account analyses as it is also worth examining the causes of deviations in the current account balance from its equilibrium.

*Results of a shock decomposition using the Bundesbank DSGE model*

The Bundesbank DSGE model explains the dynamics of trade surpluses since the turn of the millennium through to the 2008 economic crisis mainly by means of four determinants (shocks): the rising level of savings in Germany, low government spending, (favourable) developments in the rest of the euro area and the domestic production technology (see the chart on p. 30). The relatively strong domestic investment activity had a dampening effect during this period, though to a lesser degree when compared with the contribution from savings. The very weak wage growth in Germany during this period did not contribute to the rise in net exports.

When the financial and economic crisis set in in 2008, the favourable developments went into reverse in the rest of the euro area. The countries particularly hard hit by the sovereign debt crisis underwent severe adjustment processes in the course of which their current account deficits with Germany came down. For this period, the extremely favourable developments in countries outside of the euro area explain to a large extent the positive deviations of trade surpluses from their historical average. This reflected the favourable developments in industrial countries such as the United States, but also the strong growth in many Asian economies. Domestic production technology and savings continued to contribute positively, al-

beit the latter to a lesser extent than in the years prior to 2008. Domestic investment and, albeit to a limited extent, monetary policy now also had an expansionary effect on the balance.

Overall, the results are in line with the description of the stylised facts, namely that a variety of factors contributed to the balance; no single factor provides a satisfactory explanation. Stimuli from outside Germany played a key role in particular. As for domestic factors, saving and investment were significant, with government spending playing a certain role, too.

As indicated above, the current account's structural components cannot be explained in the analysis discussed above. However, knowledge about these structural components is necessary to determine a current account equilibrium. To close this gap, alternative models are required. Because the current account balance is the result of the discrepancy between saving and investment, models that admit permanent changes in saving behaviour are of particular relevance here. Such models thus also allow an analysis of long-term changes in the net asset position as these changes are largely brought about by accumulated current account balances.

*Explanations of long-term forces driving the current account*

A corresponding model in which long-term saving decisions and the net asset position are endogenously determined shows that the labour market reforms implemented at the start of the 2000s raised the level of precautionary savings in Germany. This, combined with the increased savings by non-financial corporations, contributed to a higher current account surplus during this period. Another model underscores the fact that demographic trends will also boost savings and therefore – taken in isolation – increase the current account balance (see the box on pp. 32-34).

*Labour market reforms and demographic trends cause saving to increase and contribute to the current account surplus*

# Long-term changes in saving behaviour and the current account

Models that explain long-term changes in saving decisions can also explain long-term developments in the current account that result from these changes. This is illustrated here using two models that focus on the impact of labour market reforms and demographic trends on saving.

## Labour market reforms and the current account[1]

In the discussion both at home and abroad, the labour market reforms introduced after the turn of the millennium are often cited as a key factor for the rise in the German current account balance. Conventional DSGE models produce little evidence to confirm this. One reason for this could be that these models cannot adequately capture any long-term changes in saving behaviour as a consequence of the reforms. By contrast, within a model framework that allows for involuntary unemployment against which households with heterogeneous employment statuses can only partially insure themselves, there are incentives for precautionary saving. The degree of precaution depends on the risk of becoming unemployed and on the expected subsequent loss of income, which also accounts for the expected duration of unemployment.

By lowering the level of unemployment benefits, the labour market reforms in Germany in the early 2000s reduced wage claims and increased the efficiency of job allocation. This lowered the risk of unemployment. Taken in isolation, this was intended to reduce the propensity to save, as it decreased both the likelihood of becoming unemployed as well as the expected duration of remaining unemployed. At the same time, however, the lower unemployment benefits increased the potential loss of income in the event of actual unemployment. In the model simulation, the second effect predominated. This means that the reforms had a lasting positive effect on domestic saving. However, the higher savings were not entirely absorbed by domestic investment activity. The surplus increased the level of net external assets, thereby contributing to the rise in the current account.

Compared with an analysis excluding precautionary saving, the German current account balance was around one-tenth to one-third higher between 2005 and 2016. In this period, the surplus grew from 4½% to 8½%. Nearly 0.6 percentage point – or about 15% – of this rise of almost 4 percentage points can be explained by a greater precautionary savings motive.

## Ageing and the current account

An alternative way of explaining the net asset position endogenously in macroeconomic models is to introduce ageing as a motive for saving. This is possible in a model with overlapping generations (OLG model) that distinguishes between phases of employment and retirement. In this case, demographic trends have an impact on macroeconomic variables – including the current account.
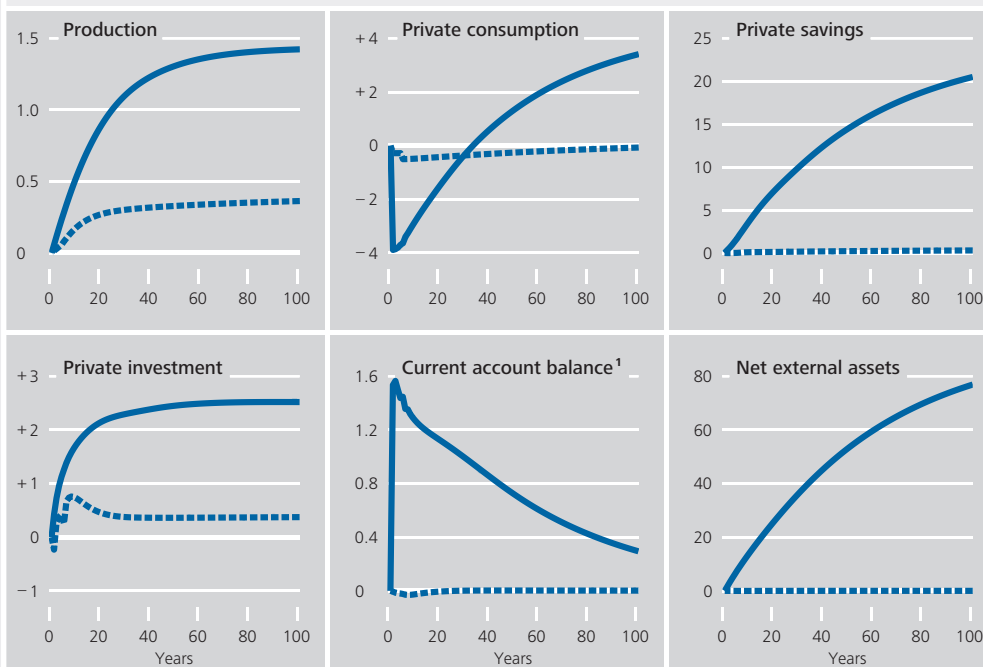
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1 See Hochmuth et al. (2019).

**Macroeconomic effects of the labour market reforms in Germany** *

Percentage deviation from baseline
(excluding reforms)

Model with incomplete insurance ▪▪▪▪ Representative agent model



* Model-based reaction of selected macrovariables in response to the German labour market reforms introduced in the early 2000s.
**1** GDP deviations in percentage points.
Deutsche Bundesbank

An OLG model developed at the Bundesbank[2] features a number of birth cohorts. Members of each cohort have a certain probability of dying each year. However, no member of a cohort can reach an age of more than 100. Alongside Germany, the model also depicts the rest of the EU. It is an equilibrium model, which allows the effects of the age structure on macroeconomic reference variables to be fully analysed. The life cycle of households is divided into an employment phase and a retirement phase. A redistributive public pension insurance scheme is in place. However, households can also form additional, capital-backed private savings both in Germany as well as in other EU countries. The formation of external assets is calculated as the difference between the domestic capital supply (savings) and domestic capital demand (for investment purposes).

**Proportion of the current account surplus that can be explained by the German labour market reforms**

As a percentage of GDP
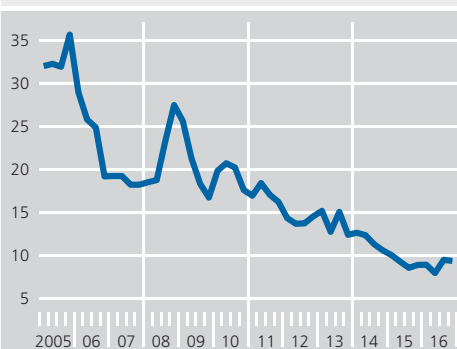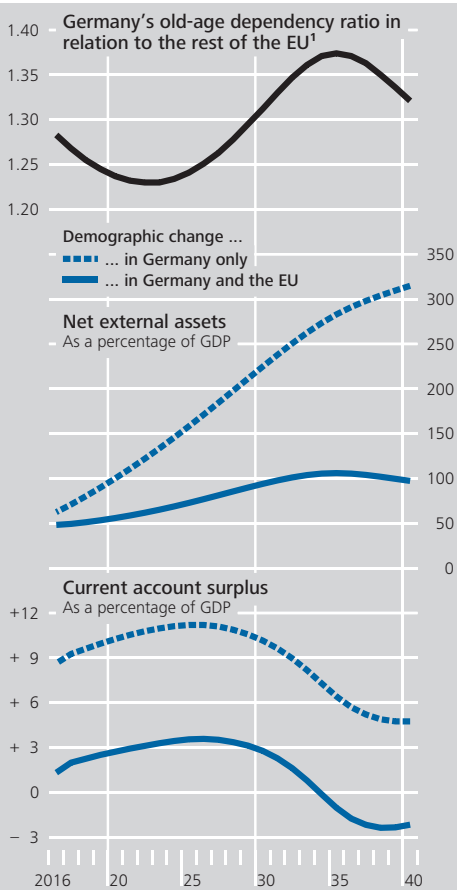


Sources: Eurostat and Bundesbank calculations.
Deutsche Bundesbank

Demographic trends influence the formation of wealth in two ways. An ageing

**2** The Bundesbank uses a fully developed OLG model for simulation purposes. For more information, see Deutsche Bundesbank (2019e) as well as Schön (2020). The following comments are based on an extended version of this model.

## Impact of demographic change on the current account

Germany's old-age dependency ratio in relation to the rest of the EU[1]

Demographic change ...
- - - ... in Germany only
—— ... in Germany and the EU

Net external assets
As a percentage of GDP

Current account surplus
As a percentage of GDP

Sources: OECD and Bundesbank calculations. **1** The old-age dependency ratio is the ratio between the number of persons in a population aged 65 or older and the number of persons aged between 15 and 64.

Deutsche Bundesbank

crease individual saving. At the same time, demand for capital in an ageing and shrinking population is likely to fall. All of these factors suggest that countries that are ageing more rapidly than others build up a larger amount of external assets and, as a result, generate higher current account surpluses.[3]

The model is calibrated taking account of current OECD demographic projections. Taken in isolation, Germany's demographic trends continue to result in considerable upward pressure on the net external position and, consequently, the current account balance. This outlook is somewhat limited to the extent that other economies are also faced with similar demographic prospects. However, the model simulation shows that the associated German current account surplus would nevertheless be positive.[4] Here, the model simulations should be viewed less as a specific quantitative projection and more as an illustration of the possible long-term effects of demographic change on saving and investment.

population means that older age groups increase in size relative to younger age groups. As older households are wealthier, however, the aggregate wealth of all households rises. This is a purely compositional effect that increases the capital supply without individual households having changed their saving behaviour as they age, although this is likely, too. For example, rising life expectancy coupled with a fixed retirement age leads to longer periods of drawing on pension benefits. A simultaneously ageing and shrinking population results in pressure on the redistribution-based pension insurance scheme. These effects are likely to in-

**3** In this context, household savings already reach their highest level many years previously. Demography-related current account surpluses therefore materialise prior to rising relative old-age dependency ratios.
**4** The other EU Member States were also modelled. If the model were expanded to include the rest of the world, the upward pressure on the German current account balance would likely be even greater. In this regard, the aggregate of these countries would, in relative terms, create less demographic pressure than the EU countries.

# Simulations of policy measures and external changes

The question of which factors have contributed to Germany's high current account surpluses and which could contribute to these surpluses in the future has been at the heart of the analyses thus far. Below, policy measures that are regularly recommended in national and international discussions as a means of reducing the German current account surplus are to be simulated in the selected models. Since developments in the international arena have also played a key role in explaining the balance, adjustments in the international setting are also included in the analysis.

## The scenarios analysed

In light of the regular recommendations to reduce the German current account surplus mentioned above, the results of three temporary fiscal policy measures are described below: an increase in government consumption, an increase in government investment and a reduction in VAT.

Specifically, the fiscal measures are calibrated such that they increase the government deficit by 1% of GDP over a period of five years. Thereafter, policy slowly returns to the fiscal baseline. The relevant fiscal rule inherent in the models, which is intended to ensure the long-term sustainability of public finances, is suspended for a period of ten years. Monetary policy reacts endogenously, usually by setting a short-term interest rate, according to a specified monetary policy reaction function.

The recommended measures to liberalise the services markets are modelled here as a permanent reduction in the profit margins in the non-tradable goods sector. Such measures can only be meaningfully analysed in the two models with a multi-sector structure (i.e. EAGLE and FzBBKM).

Two of the many relevant adjustment mechanisms in the international setting have been selected: a marked slowdown in China's growth and an appreciation of the euro exchange rate.[9]

## Simulation results

### Fiscal policy: increases in government consumption

Higher government consumption boosts aggregate demand directly. In order to adjust production accordingly, demand for labour and productive capital goes up. Rising wages place upward pressure on domestic prices, and price competitiveness falls. This dampens German exports and encourages import demand. However, domestic price pressures affect export prices, too. This price effect offsets the volume effect on the current account balance.

Overall, the models illustrate that higher government consumption reduces the current account surplus over the simulation horizon (see the chart on p. 36). In most of the models, increasing government consumption by 1% of GDP lowers the current account balance by approximately ½ percentage point. In the semi-structural models (NIGEM and MEM), however, the effects are greater than in the DSGE models; this is because semi-structural models have more pronounced transmission on the demand side. Private consumption, in particular, and therefore import demand, too, increase more sharply in these models than in DSGE models. In their pure form, the latter even include a negative effect ("crowding out") on private consumption and private investment. This is due to their future-oriented expectations, which is heavily emphasised in these models: forward-looking households and firms keep an eye on the future costs of government deficits (known as Ricardian equivalence).

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**9** A number of other external and fiscal policy measures are analysed in Deutsche Bundesbank (2020e).

Response of selected variables to an increase in government consumption*

Deviation from the baseline — EAGLE ▪▪▪ FzBBKM ▪▪▪ FiMod ▪▪▪ FiModOLG — GEAR — NiGEM — MEM
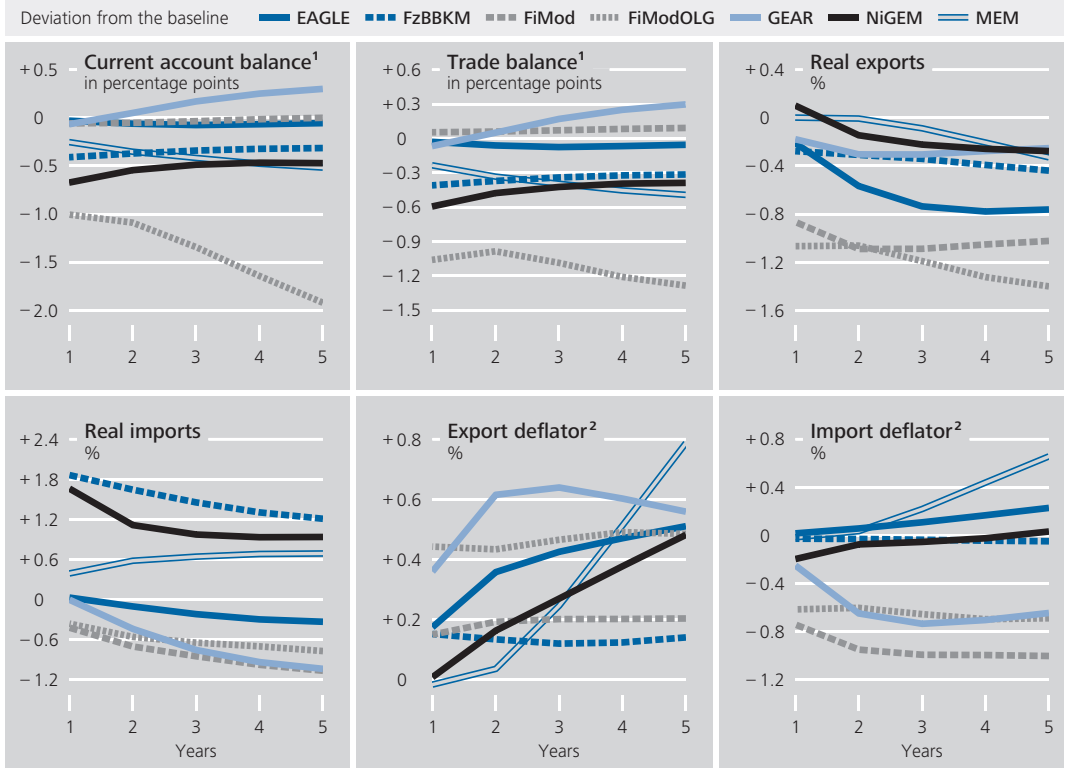
* Shock corresponds to an ex ante rise in government consumption of 1% of GDP over a period of five years. **1** As a percentage of GDP. **2** Deflators, exports and imports in the DSGE models and in FiModOLG relative to developments in domestic consumer prices.
Deutsche Bundesbank

The model with overlapping generations (Fi-ModOLG) shows the quantitatively strongest response. This is not only due to a stronger response on the part of export or import demand, but also to the long-term shift in Germany's net asset position. The debt-financed fiscal expansion reduces the net external asset position and, in turn, cross-border income flows. Moreover, each generation has a limited life expectancy. As a result, the future costs of a current deficit-funded expansion are less relevant than in the DSGE models (so Ricardian equivalence no longer applies). This result underlines the fact that models in which the net international investment position is calculated endogenously (also in the long-run equilibrium) are able to generate stronger effects on the current account than DSGE models do. Indeed, there are reasons to assume that, if anything, DSGE models underestimate the effects on the current account. Furthermore, the assumption regarding the existence of Ricardian equivalence is not fully satisfied in the real world. The possible reduction in private consumption resulting from higher government deficits is therefore likely to be overemphasised in DSGE models.

### Fiscal policy: rise in government investment

Similarly, higher government investment has a direct effect on demand. However, when compared with higher consumption, the import content of this additional demand may be greater. The fact that investment may also produce a supply effect in the models is more important, however. Productive government investment tends to amplify domestic output potential and raise labour productivity. It thus has a more lasting effect on production compared with consumption. This becomes especially noticeable in DSGE models due to their forward-looking expectations for household consumption and imports. Although, taken by itself, this reduces the current account surplus, the expansion of productive capacity also curbs

*Higher government investment has additional supply effect: hence effect on the surplus is not clear-cut*

## Response of selected variables to an increase in government investment*

Deviation from the baseline    EAGLE   ■■■ FiMod   ⋯⋯ FiModOLG    GEAR    NiGEM    MEM



* Shock corresponds to an ex ante rise in government investment of 1% of GDP over a period of five years. **1** As a percentage of GDP. **2** Deflators, exports and imports in the DSGE models and in FiModOLG relative to developments in domestic consumer prices.
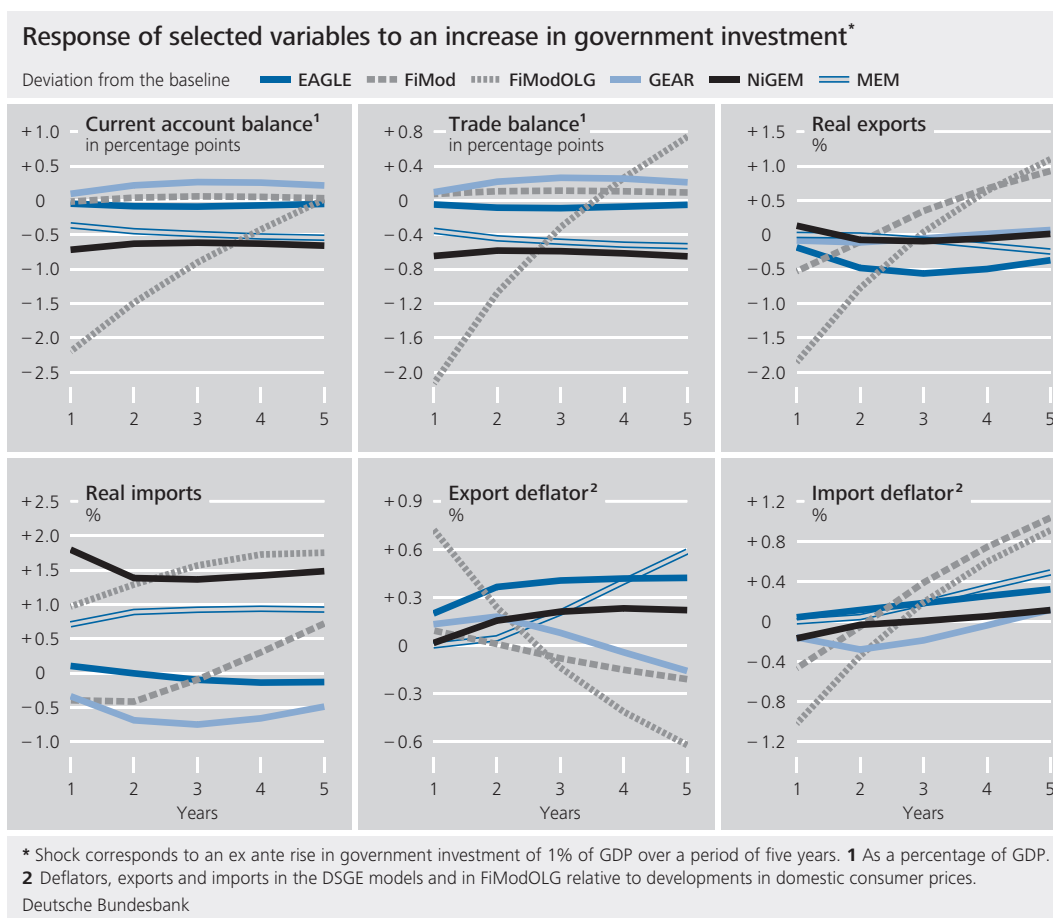Deutsche Bundesbank

the upward pressure on prices stemming from the increase in demand. Accordingly, price competitiveness does not deteriorate as strongly, and the decline in exports is less pronounced. Given these different factors, it is not clear a priori whether an increase in government investment reduces the German current account balance more or less strongly than a rise in government consumption.
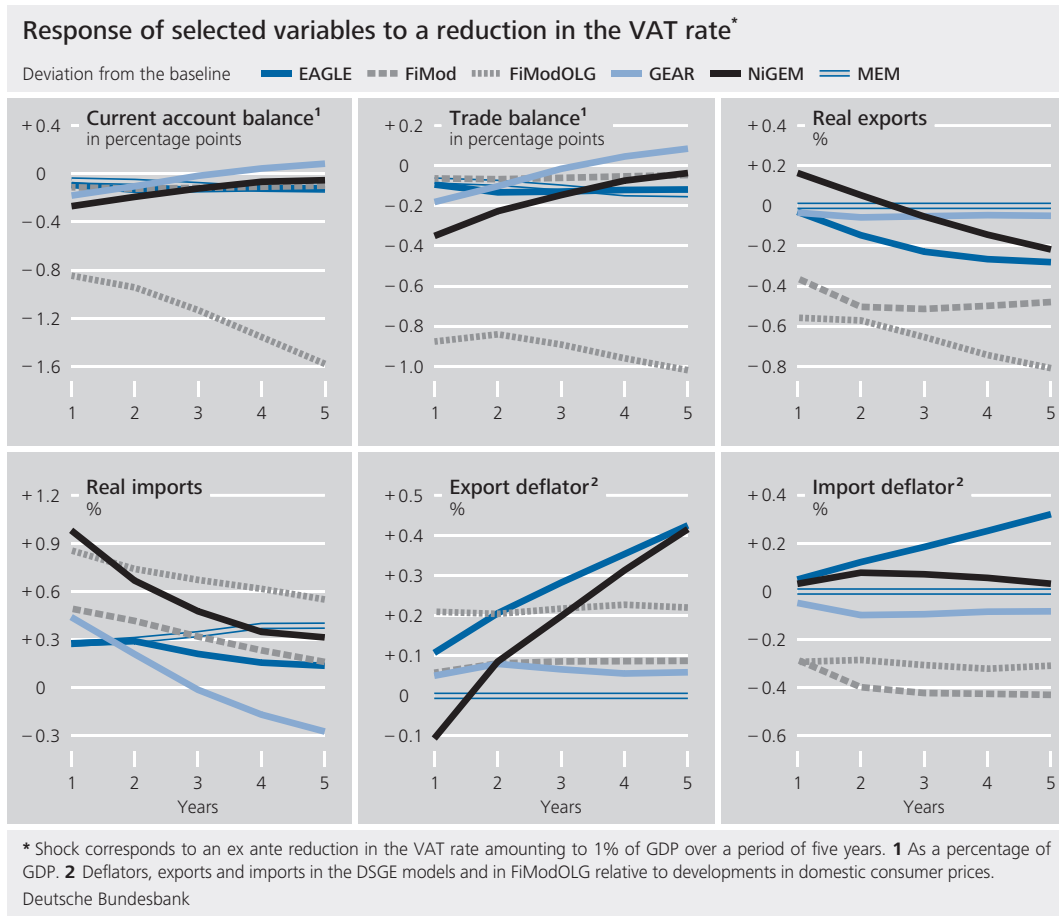
The simulations do not provide a clear picture either (see the chart above). In some models (EAGLE and MEM), the German current account surplus shrinks. One reason for this in MEM is that the import content of government investment is greater than that of government consumption. By contrast, the lower loss of price competitiveness and the higher level of aggregate productivity in other models results in a smaller decline or even an expansion in the current account surplus (FiMod and GEAR).

### Fiscal policy: reduction in value added tax

A temporary reduction in value added tax provides a boost to households' purchasing power by lowering prices after tax. The resulting overall increase in aggregate demand in Germany stimulates both demand for domestically produced goods and for imports. In order to satisfy higher demand for domestic goods, the demand for labour and capital rises, increasing marginal production costs and thus also the prices of domestic goods. Domestic price inflation also affects export prices. The associated real appreciation dampens export growth and additionally promotes imports.[10] This reduces the current account surplus.

*A reduction in value added tax decreases the current account surplus*

10 A similar price effect can be seen for imported goods produced abroad, if demand for such goods increases. However, since imported goods have a lesser weight in the bundle of goods consumed by German households in relative terms than those produced domestically, and given that German demand for goods produced abroad is less significant there, this effect is considerably weaker in the case of import prices.

Response of selected variables to a reduction in the VAT rate[*]

Deviation from the baseline — EAGLE ▪▪▪ FiMod ⫶⫶⫶ FiModOLG — GEAR — NiGEM ═ MEM

* Shock corresponds to an ex ante reduction in the VAT rate amounting to 1% of GDP over a period of five years. **1** As a percentage of GDP. **2** Deflators, exports and imports in the DSGE models and in FiModOLG relative to developments in domestic consumer prices.
Deutsche Bundesbank

The model simulations support these hypotheses (see the chart above); the current account surplus decreases in all the examined models. This decline is mainly driven by adjustments in imports and exports. However, the overall effect is not particularly strong in most cases. As in all other scenarios, the FiModOLG shows the most marked decline in the balance. This can be explained by the fact that households in OLG models have a relatively stable saving goal over their life cycle. The trade balance drops and capital flows into Germany to finance the additional government debt. As net external assets decline (at least temporarily), foreign investment income also decreases, translating into a greater reduction in the current account surplus.

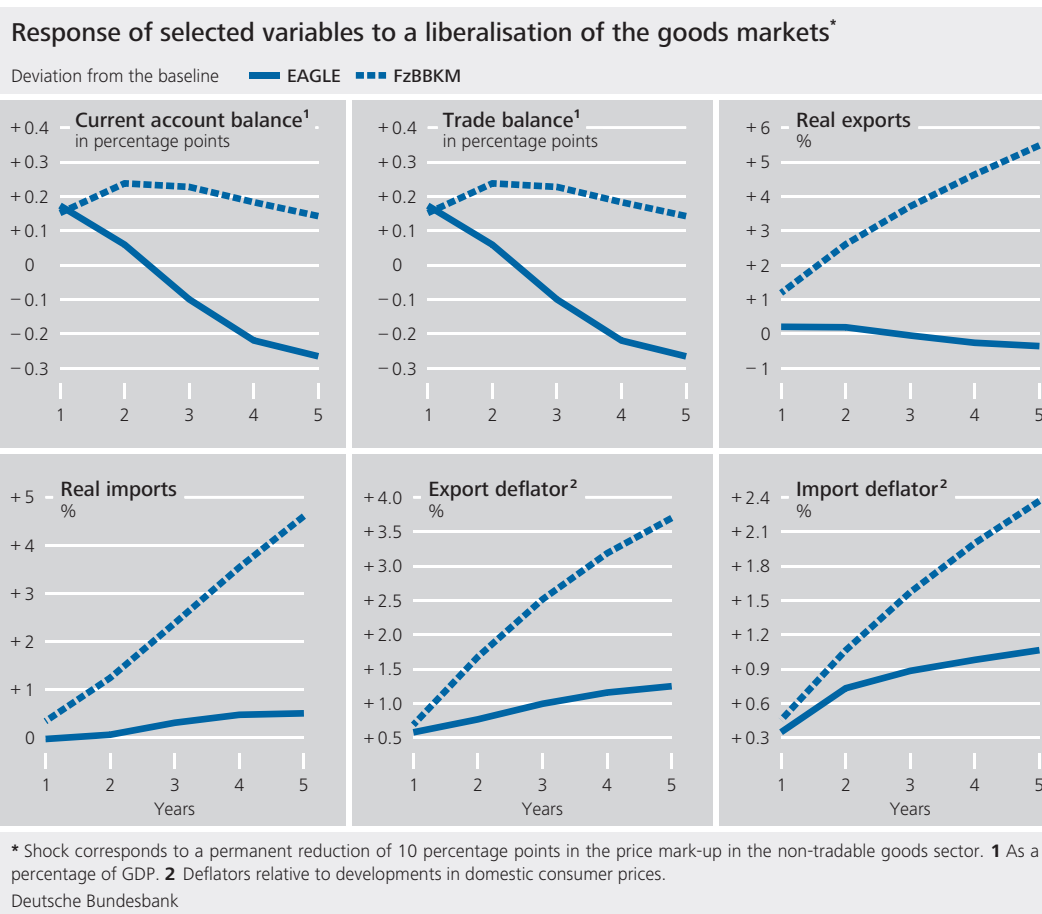### Structural reforms: goods market liberalisation

In many cases, in addition to more expansionary fiscal policy, steps towards deregulating various services are also recommended as a means of reducing the German current account surplus. This is based on the expectation that this would strengthen the non-tradable goods sector in Germany and that the associated adjustment processes would increase domestic demand for imports in the long term. An impact analysis of such measures requires models with a sufficiently differentiated sector structure. Of the seven models used here, only two (FzBBKM and EAGLE) qualify.

Liberalisation in the domestic services sector tends to decrease producers' market power and reduce profit margins in the medium term. Sales prices fall and demand for goods from the domestic services sector rises. Resources must be diverted towards production if it is to keep pace with the higher demand. This leads to higher wages, which also spill over into the export-oriented goods sector. Taken in isolation, the shift in domestic demand towards domestically produced services lowers import

*Structural reforms in the goods markets likely to have little impact on current account surplus*

## Response of selected variables to a liberalisation of the goods markets*

Deviation from the baseline ▬▬ EAGLE ▪▪▪ FzBBKM



**Current account balance[1]**
in percentage points

**Trade balance[1]**
in percentage points

**Real exports**
%

**Real imports**
%

**Export deflator[2]**
%

**Import deflator[2]**
%

Years

**\*** Shock corresponds to a permanent reduction of 10 percentage points in the price mark-up in the non-tradable goods sector. **1** As a percentage of GDP. **2** Deflators relative to developments in domestic consumer prices.
Deutsche Bundesbank

demand. However, demand for (export) goods produced in Germany, which are now more expensive, also falls. In this modelling framework, the prevailing effect on the trade balance and thus the current account depends on the assumptions made with regard to enterprises' price-setting behaviour and rigidities. As structural reforms increase the efficiency of the economy as a whole, potential output expands.[11] The now-improved long-term income outlook is reflected in stronger import demand. However, the resulting rise in income abroad also leads to an increase in exports. Given these counterbalancing effects, the impact on the current account is not clear.

This finding is also reflected in the simulation results (see the chart above). In the short term, the current account surplus actually increases in both models. In the FzBBKM, a positive effect persists even in the long term. However, in the EAGLE model, the original stimulus is reversed, and after around four years, the cur-

rent account surplus is around ¼ percentage point lower than prior to the reforms. These differences are due to a persistent increase in exports in the FzBBKM. The latter can be attributed to different assumptions regarding the price-setting behaviour of exporting companies.[12] Interestingly, however, both models nevertheless display very similar GDP responses.

Overall, the model simulations suggest that liberalising services in Germany would be unlikely to have any noticeable impact on the current account surplus.

**11** The assumed market power on the part of the enterprises drives a wedge between production costs and sales prices, which leads to disproportionately large corporate profits from an efficiency point of view. A reduction in this wedge gives rise to efficiency gains and, ultimately, to an expansion in potential output.
**12** The FzBBKM assumes that exporters express their export prices in their domestic currency. This producer currency pricing means that the pass-through of a depreciation of the exchange rate to export prices in foreign currency is more pronounced than in the EAGLE model, which assumes that German exporters adopt local currency pricing.

Response of selected variables to an appreciation of the euro*

Deviation from the baseline ▬▬ EAGLE ▬▬▬ FzBBKM ▬▬ NiGEM ══ MEM
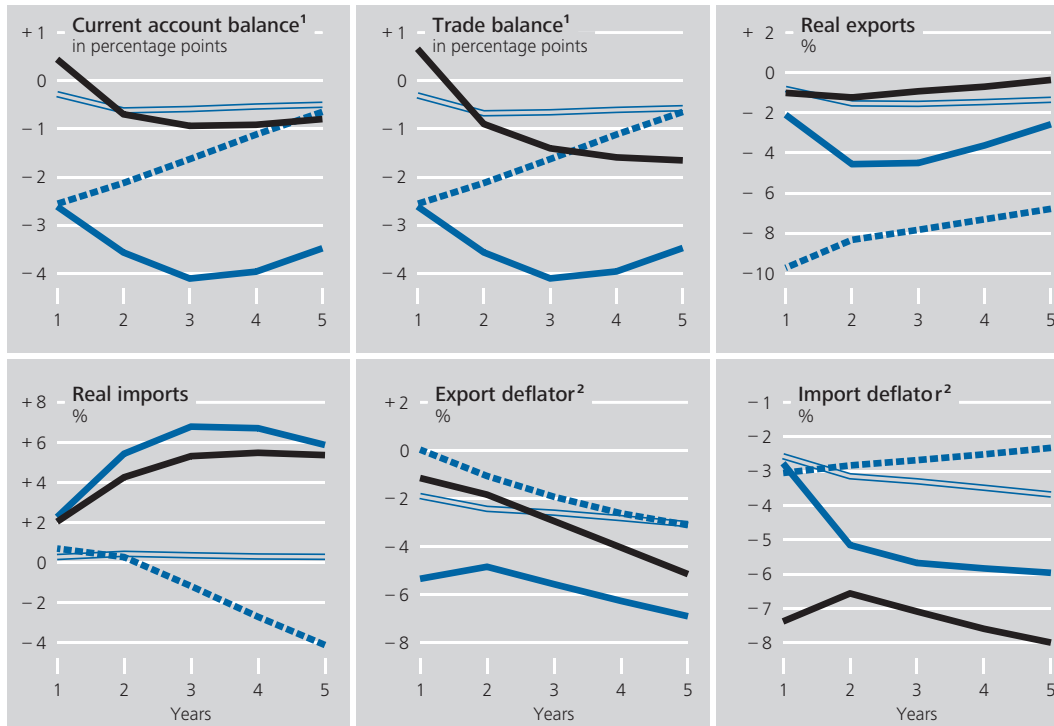


* Shock corresponds to a nominal effective appreciation of the euro by 10% over a period of five years. **1** As a percentage of GDP. **2** Deflators, exports and imports in the DSGE models relative to developments in domestic consumer prices.

Deutsche Bundesbank

### Adjustments in the international environment: an appreciation of the euro

*An appreciation significantly reduces the current account balance*

Exchange rates are important drivers of relative prices between Germany and abroad, especially in the short to medium term, and are therefore also significant for current account balances. In the following, a 10% effective appreciation of the euro over a five-year period is investigated (see the chart above). Effective means that the exchange rate movement is broadly based across the most important German trading partners. Combined with price adjustments at home and abroad, this would also lead to a marked appreciation in real terms, stimulating imports and dampening exports. Aggregate output in Germany declines and domestic prices fall in this scenario.

Some goods exported by Germany are invoiced in domestic currency, i.e. the euro (producer currency pricing). In the case of these goods, falling domestic prices also affect export prices
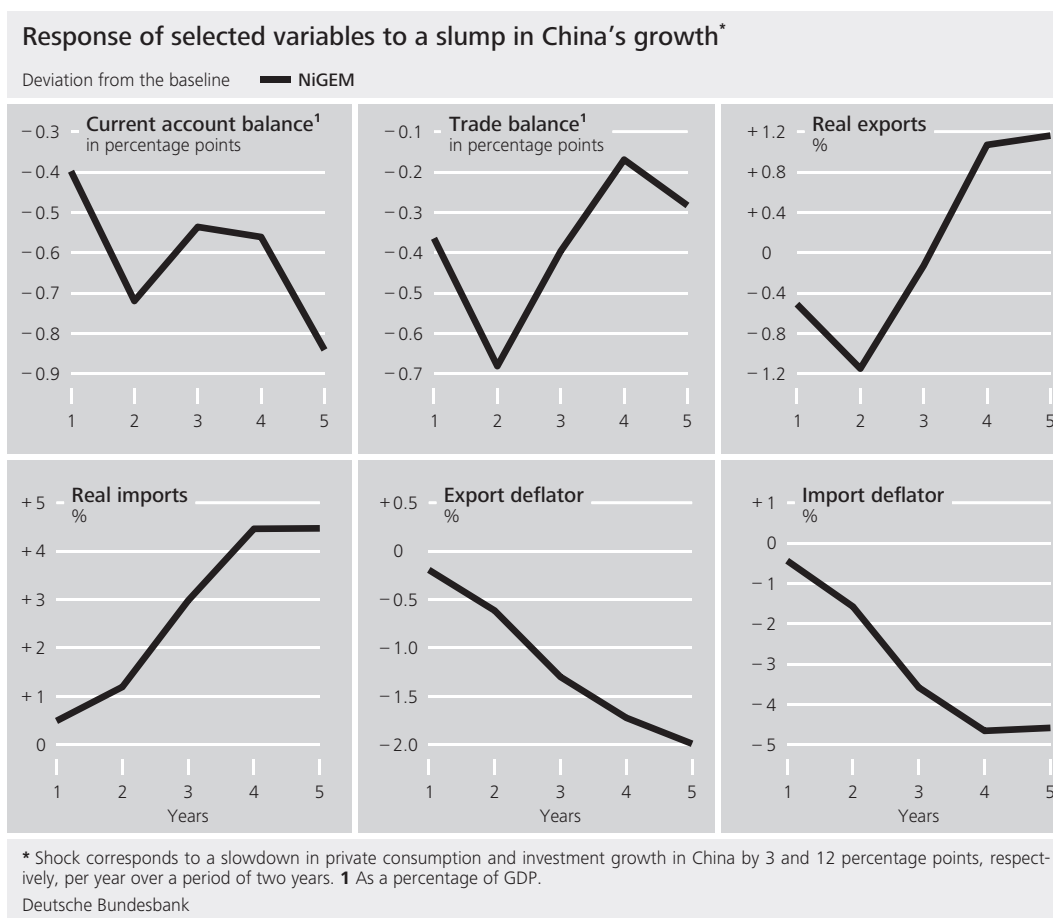
in euro. From a non-German perspective, however, the reduction in the price of such goods, expressed in the respective local currency, is limited, as the euro appreciates at the same time. The current account surplus decreases markedly, by ½ to 1 percentage point.[13]

### Adjustments in the international environment: economic downturn in China

Particularly in the years after 2010, the German current account surplus was driven – as described above – by growth in exports to countries outside Europe. The rapid catching-up process in the Chinese economy played a key role in this regard. Against this background, the

*Downturn in growth momentum in China reduces the German surplus markedly*

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**13** Only the EAGLE model bucks this trend, showing a drop in the balance of almost 4 percentage points. Here, export prices (in euro) fall more sharply. This is due to the assumption that exporters' price-setting is based on the conditions in the local sales markets (local currency pricing). This reaction indicates that price setting in the international context may have a significant impact on the current account balance.

## Response of selected variables to a slump in China's growth*

Deviation from the baseline ▬▬ NiGEM



**Current account balance[1]**
in percentage points

**Trade balance[1]**
in percentage points

**Real exports**
%

**Real imports**
%

**Export deflator**
%

**Import deflator**
%

Years

**\*** Shock corresponds to a slowdown in private consumption and investment growth in China by 3 and 12 percentage points, respectively, per year over a period of two years. **1** As a percentage of GDP.

Deutsche Bundesbank

question arises as to the extent to which a slowdown in growth momentum in China could affect the German current account. To explore this, a simulation was carried out using the NiGEM semi-structural multi-country model, which assumes a 3 percentage point reduction in private consumption growth and a 12 percentage point decline in investment growth in China. These shocks are assumed to last for two years. Thereafter, the Chinese economy slowly returns to its old growth path.

The increased importance of the Chinese economy is evidenced by the fact that an economic downturn in China, such as the one considered here, would have global repercussions. In this simulation, global GDP falls, and inflation also declines worldwide. As a result, German exports sink and imports increase. European monetary policy becomes looser in reaction to these developments, which bolsters domestic output and private consumption. This also stimulates import demand. The German cur-

rent account surplus is reduced by around 1 percentage point in this simulation (see the chart above).

## ◾ Conclusion

The model analyses of the German current account surplus presented here provide both methodological and economic policy insights.

In terms of explaining the drivers of the German current account surplus, the analysis based on the Bundesbank's DSGE model produces results that are largely in line with the descriptive stylised facts. It suggests that the high current account surplus (relative to its historical average) is attributable to a variety of factors. These include domestic factors such as comparatively large savings and relatively weak investment. International factors also play a key role. Prior to 2008, there was strong demand from other euro area countries for German

*Insights into modelling current account developments*

products, but this abated with the financial and economic crisis. Since then, countries outside the euro area have increasingly contributed to large current account surpluses in Germany.

In addition to its high level, a particular feature of the German current account surplus is its persistence. However, models that focus on explaining short-term deviations from an equilibrium path have shortcomings in terms of analysing persistently high surpluses. Including determinants of long-term current account positions could therefore be promising for future modelling efforts. For instance, simulations using some of the Bundesbank's own models suggest that the labour market reforms at the beginning of the 2000s could have had a lasting effect on the current account. Furthermore, the strong ageing trend of the German population is also likely to increase domestic savings in the foreseeable future.

*Simulations confirm the fundamental implications of recommended policy measures, but the quantitative effects of isolated measures are limited*

This would suggest that reducing the surplus should not be made a primary policy goal. That being said, it is nevertheless interesting to study the effect the regularly suggested measures may have on the balance. The results of the simulations presented here confirm that the regularly recommended policy measures would tend to reduce the high current account surplus in Germany. A fiscal expansion that heightens the government deficit has a more pronounced effect in the short term for some of the simulated measures than an easing of regulations in the services market. However, the effects of fiscal measures are likely to be limited if the regular fiscal space is to be maintained.

Adjustments in the international environment could have a much greater impact on the Ger-man surplus position. For example, a sharp slowdown in growth in China or a sustained appreciation of the euro would significantly reduce the current account balance.

National measures on any plausible scale are insufficient to bring about a significant reduction in the German current account balance. If the surplus is to be lowered substantially, the international environment would also have to change.

*Current account surplus to fall below 5% this year*

The COVID-19 pandemic has resulted in a development that is expected to have a significant impact on the German current account. For instance, this year, global economic output is dwindling, international trade has collapsed and is recovering only slowly, and Chinese economic growth is decreasing sharply. This is hitting the German economy particularly hard, given its dependence on exports. Moreover, German fiscal policy is using many instruments to counter the consequences of the pandemic, and last year's fiscal surplus position will turn into a significant deficit this year.

Although the model analyses do not explicitly capture such a comprehensive shock, the various simulations, taken together, nevertheless suggest that the coronavirus crisis will result in a considerably reduced current account surplus. The Bundesbank's recently published projection factors in such a development, with the surplus expected to decline from above 7% to below 5% of GDP this year. The surplus is not expected to exceed the 6% threshold specified in the EU imbalance procedure before 2022.[14]

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**14** See Deutsche Bundesbank (2020d).

## ∎ List of references

Bernanke, B. (2005), The global saving glut and the US current account deficit, speech, Board of Governors of the Federal Reserve System.

Blanchard, O.J. (1985), Debt, deficits, and finite horizons, Journal of Political Economy 93(2), pp. 223-247.

Boz, E., N. Li and H. Zhang (2018), Effective trade costs and the current account: an empirical analysis, IMF Working Paper No 19/8.

Carney, M. (2017), https://www.bankofengland.co.uk/speech/2017/a-fine-balance, speech at Mansion House, London, 20 June 2017.

Deutsche Bundesbank (2020a), Consequences of increasing protectionism, Monthly Report, January 2020, pp. 45-66.

Deutsche Bundesbank (2020b), German balance of payments in 2019, Monthly Report, March 2020, pp. 17-39.

Deutsche Bundesbank (2020c), German net exports from the perspective of the federal states, Monthly Report, March 2020, pp. 19-21.

Deutsche Bundesbank (2020d), Outlook for the German economy for 2020 to 2022, Monthly Report, June 2020, pp. 13-31.

Deutsche Bundesbank (2020e), A model-based analysis of the German current account surplus, Technical Paper, forthcoming.

Deutsche Bundesbank (2019a), Regulation of the professional services in Germany, Monthly Report, October 2019, p. 88 f.

Deutsche Bundesbank (2019b), Transmission of wage changes to prices in the Bundesbank's macroeconometric model, Monthly Report, September 2019, pp. 19-22.

Deutsche Bundesbank (2019c), The impact of the Climate Package on economic growth and inflation, Monthly Report, December 2019, pp. 29-33.

Deutsche Bundesbank (2019d), The drivers of German net exports from the perspective of a DSGE model, Monthly Report, March 2019, pp. 19-21.

Deutsche Bundesbank (2019e), Long-term outlook for the statutory pension insurance scheme, Monthly Report, October 2019, pp. 53-81.

Deutsche Bundesbank (2018a), The potential macroeconomic impact of US tax reform, Monthly Report, February 2018, pp. 14-16.

Deutsche Bundesbank (2018b), The realignment of the Chinese economy and its global implications, Monthly Report, July 2018, pp. 39-56.

Deutsche Bundesbank (2015a), Driving forces behind the Chinese current account, Monthly Report, January 2015, pp. 20-22.

Deutsche Bundesbank (2015b), The role of trade in goods in the development of global imbalances, Monthly Report, January 2015, pp. 13-32.

Di Giorgio, G. and S. Nisticò (2013), Productivity shocks, stabilization policies and the dynamics of net foreign assets, Journal of Economic Dynamics and Control 37, pp. 210-230.

European Central Bank (2017), Recent developments in the euro area current account balance, Economic Bulletin, Issue 4/2017, pp. 50-54.

European Commission (2020), Implementation of the macroeconomic imbalance procedure: state of play, June 2020.

Federal Ministry of Finance (2017), Der deutsche Leistungsbilanzsaldo – Entwicklung und wirtschaftspolitische Implikationen, Monthly Report, March 2017, pp. 16-25.

Gadatsch, N., K. Hauzenberger and N. Stähler (2016a), Fiscal policy during the crisis: a look on Germany and the euro area with GEAR, Economic Modelling 52 (part B), pp. 997-1016.

Gadatsch, N., N. Stähler and B. Weigert (2016b), German labor market and fiscal reforms 1999-2008: can they be blamed for the intra-euro area imbalances?, Journal of Macroeconomics 50, pp. 307-324.

Ghironi, F. (2008), The role of net foreign assets in a New Keynesian small open economy model, Journal of Economic Dynamics and Control 32, pp. 1780-1811.

Gomes, S., P. Jacquinot and M. Pisani (2012), The EAGLE. A model for policy analysis of macroeconomic interdependence in the euro area, Economic Modelling 29(5), pp. 1686-1714.

Gourinchas, P., H. Rey and N. Govillot (2017), Exorbitant privilege and exorbitant duty, IMES Discussion Paper Series 10-E-20, Institute for Monetary and Economic Studies, Bank of Japan.

Hochmuth, B., S. Moyen and N. Stähler (2019), Labor market reforms, precautionary savings, and global imbalances, Deutsche Bundesbank Discussion Paper, No 13/2019.

Hoffmann, M., M. Kliem, M. Krause, S. Moyen and R. Sauer (2020), Rebalancing the euro area: is wage adjustment in Germany the answer?, Deutsche Bundesbank Discussion Paper, No 17/2020.

Hoffmann, M., M. Krause and T. Laubach (2019), The expectations-driven US current account, Economic Journal, Vol. 129(618), pp. 897-924.

International Monetary Fund (2020), World Economic Outlook: The Great Lockdown, April 2020.

International Monetary Fund (2019), External Sector Report: The dynamics of external adjustment, July 2019.

Oxborrow, D. and S.J. Turnovsky (2017), Closing the small open economy model: a demographic approach, Review of International Economics 25, pp. 44-75.

Ruppert, K. and N. Stähler (2020), Household savings, capital investments and public policies: what drives the German current account?, Deutsche Bundesbank Discussion Paper, No 41/2020.

Schön, M. (2020), Long-term outlook for the German statutory pension system, Deutsche Bundesbank Discussion Paper, No 22/2020.

Stähler, N. and C. Thomas (2012), FiMod – A DSGE model for fiscal policy simulations, Economic Modelling 29(2), pp. 239-261.

Yaari, M.E. (1965), Uncertain lifetime, life insurance, and the theory of the consumer, Review of Economic Studies 32(2), pp. 137-150.