Insight INVESTMENT

GLOBAL MACRO RESEARCH
GERMANY

IS THERE ANY HOPE FOR THE SICK MAN OF EUROPE?

JANUARY 2025

BNY | INVESTMENTS

EXECUTIVE SUMMARY

- **Manufacturing malaise:** Germany has been experiencing a period of industrial malaise since the pandemic, particularly in the key manufacturing areas of automotives and machinery. This has led to a decline in industrial production and retail sales, with GDP flatlining.
- **Structural headwinds to German growth:** The German economy faces significant structural headwinds. These include external factors such as its loss of international competitiveness and the fragmentation of global trade, and internal factors such as weak internal demand and fiscal rigidity.
  - **Competitiveness erosion:** Germany's international competitiveness has been eroded due to high energy and labour costs, and an ageing population means its labour force will decline longer term unless this is offset by higher immigration, which could bring its own challenges.
  - **Global trade fragmentation:** Germany exports substantial amounts to the US and China, with both trade relationships under pressure. The US is expected to introduce sizeable tariffs under President Trump, and China is both less reliant on German exports and increasingly competitive in Germany's key manufacturing areas.
  - **Weak internal demand:** Germany's economy is affected by weak internal demand. Despite falling inflation and growing real wages, consumer confidence remains weak, and investment is stagnant.
  - **Fiscal rigidity:** Germany's net borrowing and net debt levels are much lower than comparable peers, but the country's 'debt brake' – a limit on borrowing set in law – prevent a meaningful increase in public expenditure to offset other pressures.
- **Possibility of change:** A German election is on the horizon in February 2025, and this presents an opportunity for Germany to address its economic challenges. A likely coalition between the CDU/CSU and SPD means there is a chance for debt brake reform, increased defence spending, and an overhaul of energy and industrial policy.

GERMANY:
A STAGNATING ECONOMY

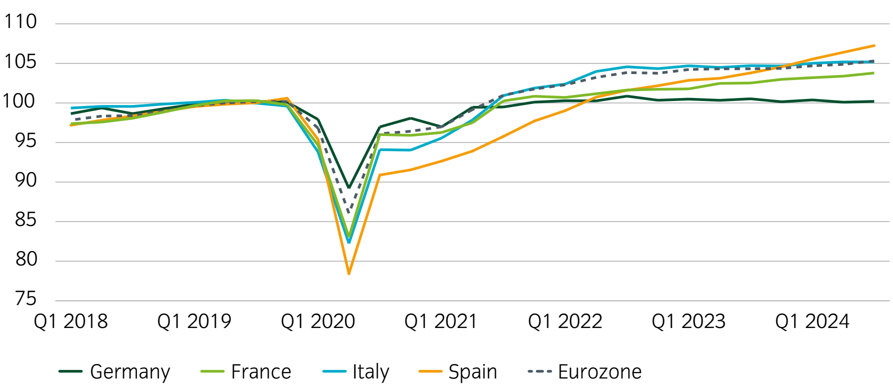
The German economy is struggling. It weathered the pandemic well, relative to its eurozone peers, but since recovering to a pre-pandemic level, economic growth has flatlined (see Figure 1).

GDP contracted in 2023, due to persistent inflation, high energy prices and weak foreign demand, and it is widely forecast to have contracted marginally again over 2024 as a whole. The consensus is for a return to growth in 2025, but barely – the trend has been for consensus forecasts to be revised downwards.

The challenging economic environment contributed to the collapse of the governing coalition in November 2024. This occurred after Chancellor Olaf Scholz dismissed Finance Minister Christian Lindner due to a disagreement over Germany's 2025 budget. The dispute centred on whether to relax the 'debt brake' – a legal requirement that limits government borrowing except in exceptional circumstances. The debt brake had been previously suspended to permit the government to borrow billions of euros in response to the pandemic and Russia's invasion of Ukraine.

Germany is now set for an election in February 2025. The winners will face difficult questions, but it could be an opportunity for meaningful change if a new coalition government takes the opportunity to address the key factors affecting the German economy.

Figure 1: Germany's economic growth has lagged after weathering the pandemic (GDP)[1]



[1] Source: DESTATIS, INSEE, Istat, INE, Eurostat, as at 10 December 2024. Rebased 2019 = 100.

MANUFACTURING MALAISE

Germany's economy has traditionally depended on its robust manufacturing sector, which has been a significant driver of the nation's growth. Despite services accounting for over two-thirds of GDP, key industries like automotive and machinery have not only fuelled historical growth but also positioned Germany as a global leader in high-quality manufacturing.

Since the pandemic, Germany has been grappling with a period of industrial malaise, particularly in these key industries. The decline in manufacturing output has significantly hindered the overall recovery of Germany's GDP. While this decline has been a common issue across Europe, Germany has faced the most severe impact due to its strong reliance on the industrial sector. The decline in manufacturing has significantly impacted Germany's gross value added (GVA), a key measure of the value of goods and services produced. Compared to its global and European peers, Germany relies heavily on its manufacturing sector for GVA. However, this contribution has been decreasing, as illustrated in Figures 2 and 3.

Figure 2: Manufacturing GVA is still a large proportion of German GDP compared to peers[2]

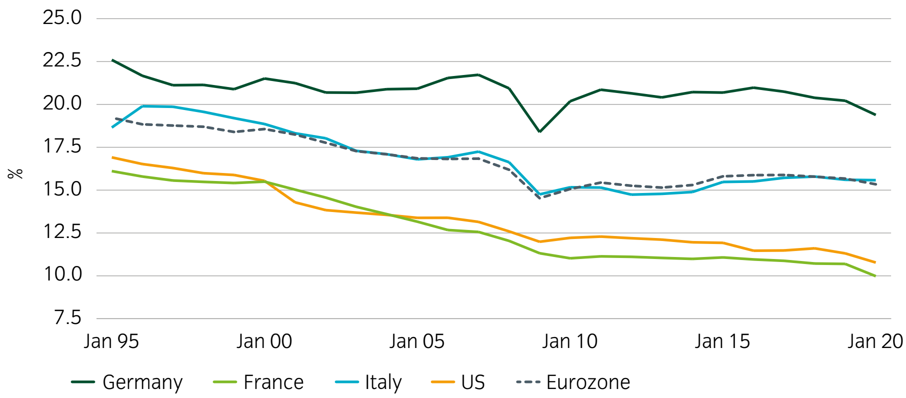
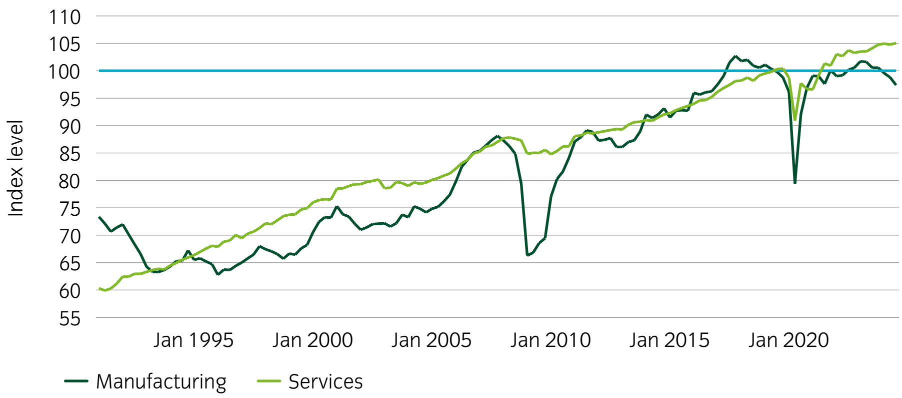


Figure 3: The contribution of manufacturing to German GVA has declined[3]

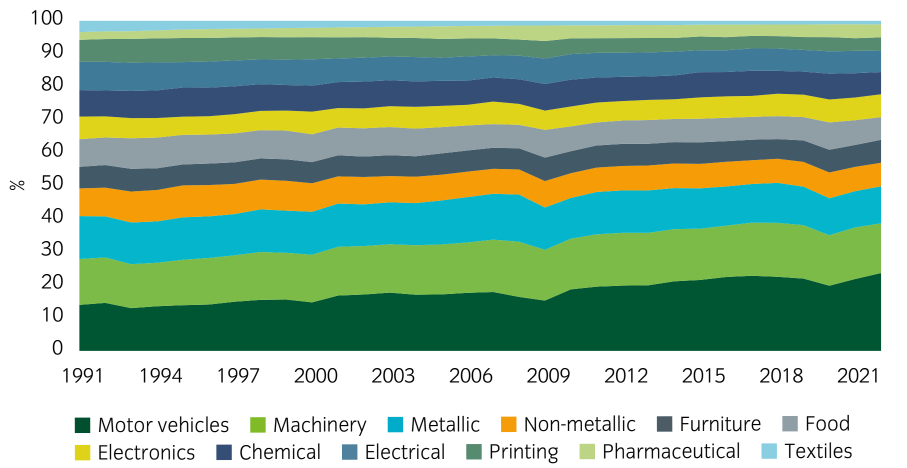


[2] Source: OECD, as at 10 December 2024.
[3] Source: DESTATIS, as at 10 December 2024. Rebased 2019 = 100.

THE RELIANCE ON AUTOS AND MACHINERY HAS DRAGGED DOWN THE GERMAN ECONOMY

Over the past few decades, the automotive industry and machinery have become increasingly significant contributors to Germany's manufacturing GVA. These two key sectors, which are cornerstones of German manufacturing, now account for approximately one-third of the country's manufacturing GVA.

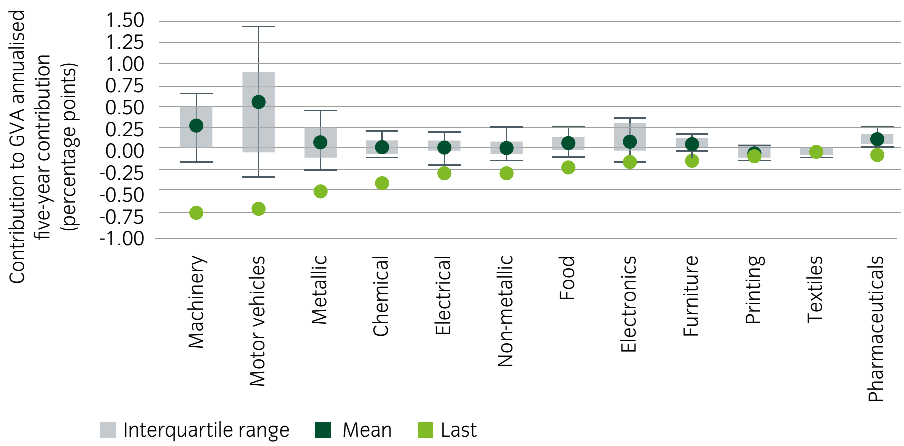
Figure 4: A third of German manufacturing GVA is generated by autos and machinery[4]



The autos industry faced severe challenges due to the pandemic, including disruptions in global supply chains, factory shutdowns, delays in component deliveries, and a slump in consumer demand, which exacerbated the economic slowdown. Machinery, Germany's largest export industry alongside motor vehicles, has also faced significant challenges.

As a result of these trends, the automotive and machinery sectors, which historically contributed the most to Germany's GVA growth, have now become significant detractors. This shift is evident when examining their contribution to GVA over the past five years compared to other manufacturing sectors (see Figure 5).

Figure 5: Manufacturing sectors are all negative but autos and machinery are detracting the most from German GVA[5]



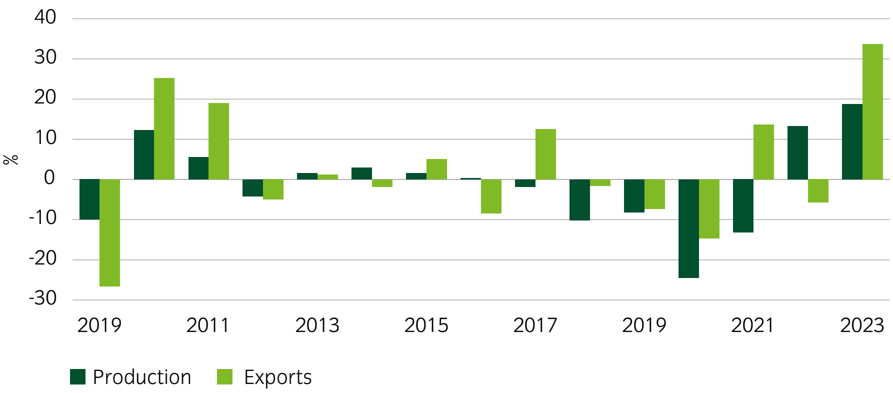
[4] Source: OECD, as at 10 December 2024.
[5] Source: DESTATIS, as at 10 December 2024. Mean refers to the average percentage-point contribution since 1991. Last refers to the most recent datapoint.

COULD THE GERMAN AUTO MANUFACTURERS RECOVER?

Exports of German vehicles have traditionally been concentrated among Germany's main trading partners, including the US, China and other European nations. This reliance presents challenges, as discussed later in this paper. However, there has been a strategic shift to diversify export markets, leading to an increase in vehicle exports to emerging economies. This diversification illustrates Germany's proactive approach to mitigating risks associated with over-reliance on a few key markets.

Both production and exports have shown overall growth recently (see Figure 6), reflecting a rebound from the severe disruptions experienced during the pandemic. This resurgence could be a sign of adaptation and recovery .

Figure 6: Production and exports of passenger vehicles are encouraging (year-on-year % growth)[6]



However, German carmakers are losing their competitiveness with high labour and production costs, and outdated technology, that is failing to attract consumers. To counter these trends, German auto manufacturers are entering joint ventures with US and Chinese manufacturers and tech firms to modernise their software offerings.

The shift to electric vehicles (EVs) presents additional challenges. EVs require fewer parts than internal combustion engine vehicles, impacting the auto supply chain in Germany, where a third of research and development spending is in the auto sector. If large auto manufacturers can successfully navigate this transition, the automotive industry could once again become a bright spot in German industry, despite growing competition from China. These questions highlight the importance of structural factors for the German economy, which may be harder to tackle.

[6] Source: ACEA, COMTRADE, as at 10 December 2024.

STRUCTURAL HEADWINDS TO GERMAN GROWTH ARE SIGNIFICANT

The German economy faces significant structural headwinds. These include external factors, such as its loss of international competitiveness relative to global peers due to rising energy costs and rising cost of labour, and the fragmentation of global trade. Internal factors within the German economy include weak internal demand and fiscal rigidity.

DECLINING INTERNATIONAL COMPETITIVENESS

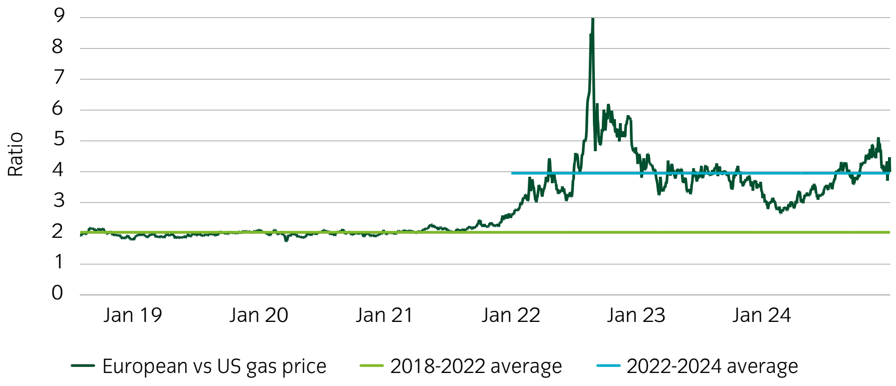
Energy costs in Germany have risen materially

The Russian invasion of Ukraine in 2022 severely disrupted Germany's energy supply. Having relied on cheap Russian gas for much of the post-Cold War era, Germany suddenly faced a significant shortfall, causing wholesale gas prices to soar. Additionally, the last nuclear power stations were closed in 2022, and coal is expected to be phased out by 2030.

Although wholesale gas prices have largely returned to pre-war levels, overall energy prices remain elevated. Compared to the US, European gas prices are now structurally higher, eroding competitiveness. This is particularly problematic for Germany, where manufacturing accounts for a high proportion of GVA and exports, and there are few immediate alternatives for cheap energy.

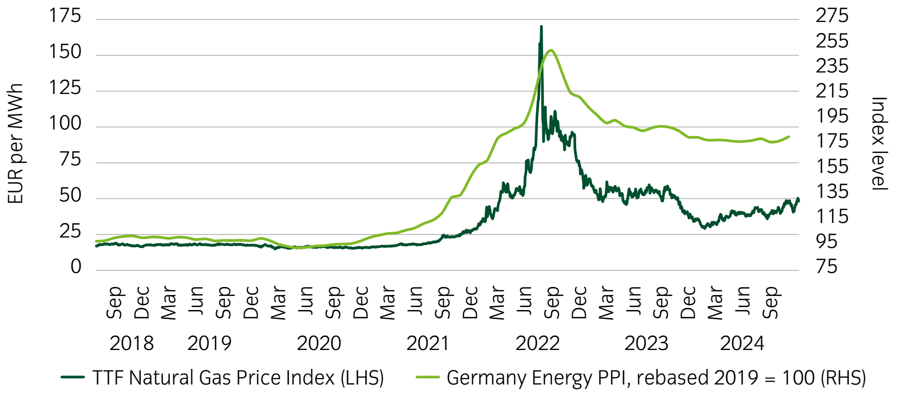
While German industry has previously recovered from similar declines in capacity and production, such as after the global financial crisis, a return to pre-pandemic levels would likely require a normalization of energy prices. There is evidence that firms are relocating production to economies with lower energy costs, such as Spain, the US, China, Central Asia, and the Middle East, leading to a permanent loss of supply-side capacity in German manufacturing.

Figure 7: European gas prices are much higher relative to US gas prices, eroding competitiveness[7]



[7] Source: Bloomberg, as at 10 December 2024.

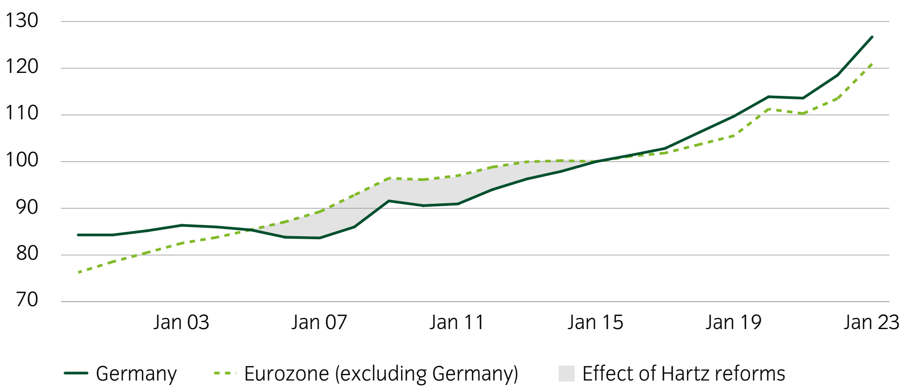
Figure 8: Higher European gas prices are affecting Germany in particular, with Germany's energy PPI materially higher[8]



German labour has become more expensive – and immigration is needed to sustain the labour force long term

Germany once enjoyed a significant unit labour cost advantage over other eurozone countries, but this advantage has diminished in recent years. The Hartz reforms in the early 2000s introduced significant flexibility into the German labour market, giving it an edge over less competitive peers. However, since the global financial crisis and the eurozone sovereign debt crisis, other eurozone countries have implemented their own labour reforms and tightened fiscal policies, closing the competitiveness gap through deflationary measures (see Figure 9).

Figure 9: Germany's unit labour costs are higher than those of eurozone peers[9]



German firms increasingly cite labour as a limiting factor, more so than in the eurozone as a whole, and this trend has been growing over the past decade[10].

Large pay deals in recent years have pushed up German unit labour costs relative to other eurozone countries (see Figure 10).

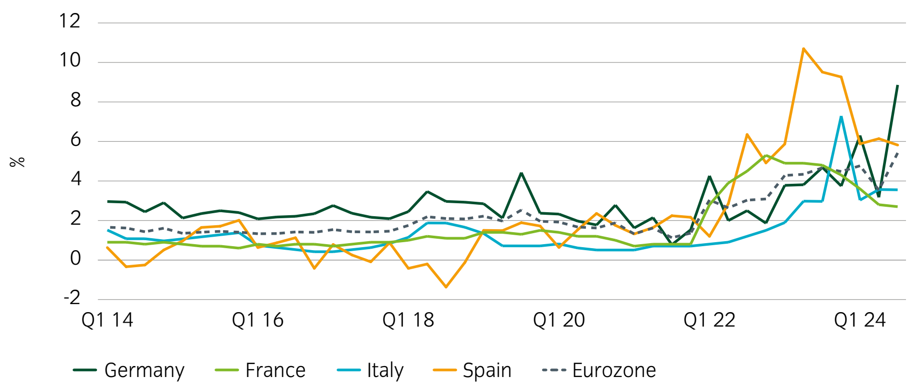
In some of Germany's more challenged sectors, labour unions are acutely aware of this and are negotiating more modest wage hikes to enable job retention. For instance, the IG Metall union, representing workers at a wide range of high-profile German employers, including auto manufacturers, reached an agreement in November 2024 for wages to increase by 2% in 2025 and 3.1% in 2026. This deal, covering 3.9 million workers, was far below the union's initial demand of 7%.[11]

[8] Source: DESTATIS, as at 10 December 2024.
[9, 10] Source: DG ECFIN, as at 10 December 2024. Rebase 2015 = 100.
[11] German union says auto and engineering workers to get 5.5% wage rise, 12 November 2024, Reuters.

8

Additionally, the union secured a deal to prevent Volkswagen from closing three plants in Germany, after Volkswagen suggested workers might need to accept 10% pay cuts to offset rising costs.[12]

Figure 10: Negotiated wage increases in Germany have also been high, raising labour costs[13]

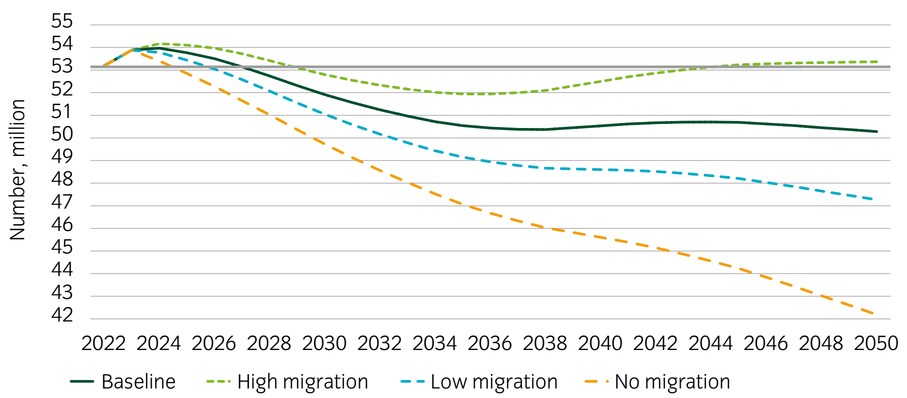


More fundamentally, structural shifts in the employment mix are occurring in Germany. Over the past decade, the share of part-time work has been steadily increasing. This trend can be attributed to the persistent tightness in the labour market, as firms find it increasingly challenging to source full-time workers.

Immigration will be crucial for the future of the German workforce. In recent years, employment growth has been almost entirely driven by immigration. Given the limited ability to increase the labour supply internally, Germany must encourage further migration and ensure effective integration to sustain growth in the labour force. Efforts have been made to attract and retain skilled workers, such as reducing the time to obtain citizenship from eight to five years and passing the Skilled Immigration Act in 2023.

However, integrating less skilled workers could prove challenging due to differences in the education mix between migrants and native Germans. While many migrants are highly skilled (proportionally more so than Germans), a significant number are also unskilled compared to the domestic workforce. Germany's strong vocational education system should help train unskilled migrants, but cultural and language barriers may hinder their access to available resources.

Figure 11: Immigration will be necessary to sustain the working-age population in Germany[14]



[12] VW reaches union deal to cut 35,000 German jobs after gruelling talks, 21 December 2024, Reuters.
[13] Source: BUBA, Banque de France, ECB, Istat, MEH, as at 10 December 2024.
[14] Source: Eurostat, as at 10 December 2024.

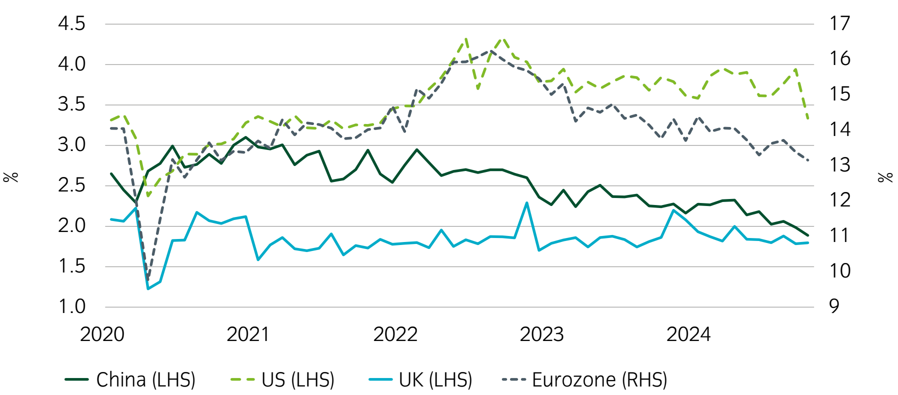
DEGLOBALISATION IS PUTTING PRESSURE ON GERMANY – WHICH DEPENDS ON GLOBAL TRADE

With the US and China becoming more isolationist and adopting protectionist trade practices, global trade is slowing down. Before the pandemic, German and European goods exports were broadly in line with global averages.

Eurozone goods exports were particularly hard hit by the pandemic. While they have made a strong recovery overall, supply-chain issues and lockdowns prevented German firms from capitalizing on the elevated demand for goods during this period. As economies reopened, the German goods trade suffered as demand for services surged. German goods exports have only just rebounded to pre-pandemic levels.

Given the high proportion of German exports to both the US and China (see Figure 12), we expect exports to continue to act as a drag on German growth.

Figure 12: German exports to the US and China are substantial (% of exports of German GDP)[15]



The US: President Trump's second term threatens significant tariffs

The number of restrictive trade policies has more than doubled since President Trump's first term, overshadowing any efforts for liberalisation. Potential tariffs under President Trump's second administration are likely to extend this trend, as his criticism of the EU's "anti-competitive" practices continues.

European car manufacturers are particularly vulnerable to tariff imposition due to their high share of US sales made in Mexico or the EU. German manufacturers are especially affected as they operate at the premium end of the market, resulting in the highest absolute volume exposure. However, the impact might be limited due to the price inelasticity of these cars. Other industries with significant exposure to the US include machinery, pharmaceuticals, other vehicles, computers, electronics, and electrical appliances.

To understand more about the potential impact of tariffs under President Trump, read our paper Tariffs and Trade Wars – Implications of a Second Trump Presidency.

China: a growing competitor to German expertise

The German economy is highly dependent on Chinese growth. China is Germany's second-largest trading partner after the US, and Germany exports significantly more to China than its European peers. The motor vehicles and machinery industries, Germany's two largest export sectors, are particularly exposed, with around 10% of each reliant on Chinese demand. Additionally, Germany imports much more from China than other eurozone countries.

[15] Source: DESTATIS, as at 10 December 2024.

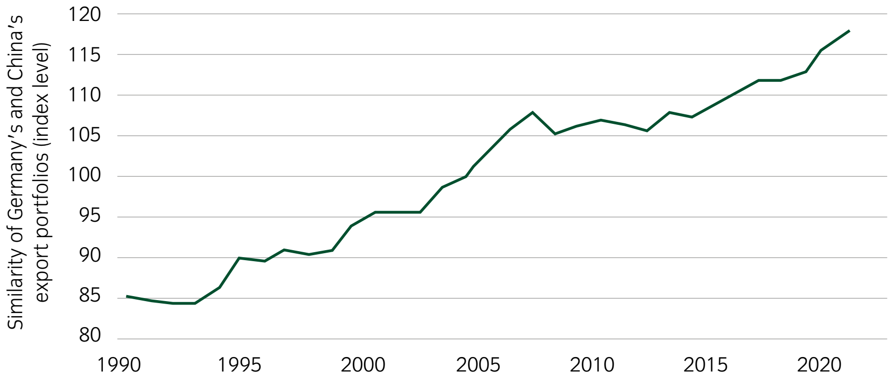
There is a growing imbalance in the relationship between the two countries. China is investing and importing less, particularly from Germany, while Germany is increasingly importing capital and intermediate goods from China. Notably, in recent years, Germany has even started to import passenger motor vehicles from China.

China has significant excess industrial supply, and its production costs continue to decline relative to Germany. Over the past 30 years, the export portfolios of China and Germany have grown increasingly similar, putting them in direct competition (see Figure 13).

As a result, Germany's major export industries are losing market share to China. A striking example is EVs, where China is rapidly closing in on Germany's market share and can sell EVs at a steep discount compared to European and US-produced vehicles.

The European Commission recently decided to impose restrictions on Chinese-built EVs, but Germany notably voted against the measure. Unlike other eurozone economies, Germany has a higher proportion of domestic value added from Chinese demand than China's value added in its own domestic demand. Consequently, any retaliatory measures from China would disproportionately impact Germany.

Figure 13: The export portfolios of Germany and China have become more similar – putting them in direct competition[16]



Germany is also falling behind in new technologies. While China excels in solar panels, lithium-ion batteries, and LED lighting, Germany had, up until recently, held an advantage in wind turbines, electric vehicles, and hybrid vehicles. However, China is rapidly gaining market share in these industries, and Germany's growth in these areas is slowing or even declining.

DOMESTIC CHALLENGES: WEAK DEMAND AND FISCAL RIGIDITY

Germany suffers from weak investment and private consumption, and its fiscal rules mean the government has been unable to offset these trends.

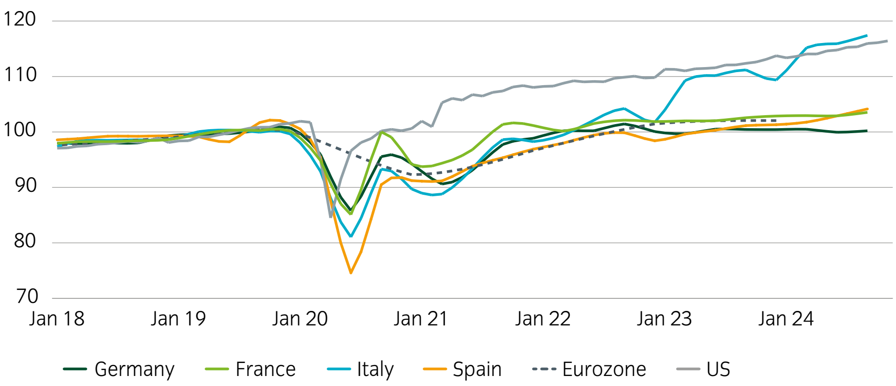
German consumption and investment have lagged in recent years

Consumption in Germany has lagged other major nations, only recovering to 2019 levels, in stark contrast to Italy, Spain, and the US. Consumer confidence has been much weaker in the eurozone compared to the US, where fiscal handouts during the pandemic prevented confidence from dipping to European levels and have kept it above trend.

[16] Source: Harvard Growth Lab Atlas of Economic Complexity Dataverse, Barclays Research.

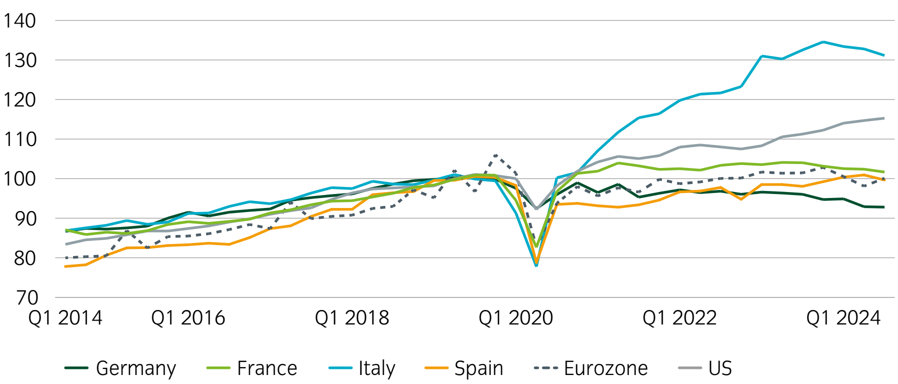
Real wages in Germany fell significantly more than in the US due to stagnant growth from the energy shock and elevated inflation, which eroded consumers' purchasing power. However, with inflation now falling, German real wages are growing again, offering hope that consumption will positively contribute to GDP growth in 2025. Despite this, Germans' savings rates have remained much higher than those of their US counterparts, stymieing consumption.

Figure 14: German consumption has lagged far behind EU peers and the US (final consumption expenditure)[17]



Investment growth in Germany has been lacklustre in recent years, remaining well below pre-pandemic levels. The contrast with the US is stark: the US Inflation Reduction Act and CHIPS Act have spurred a boom in manufacturing construction, while Germany has seen stagnation in this area due to the absence of significant fiscal stimulus.

Figure 15: Gross fixed capital formation in Germany has lagged meaningfully behind[18]



Germany's fiscal rules prevent the government from offsetting negative trends

Germany's strict fiscal rules, known as the debt brake, limit public spending such that the structural deficit cannot exceed 0.35% of GDP. This constraint has prevented the government from offsetting weak consumption and private investment.

Since its pandemic peak, public spending in Germany has been consistently falling, in contrast to the increasing public expenditure seen in the US, UK, and France (see Figure 16). Unlike France, Germany has considerable fiscal headroom to increase public expenditure if desired, as its deficits are modest and debt-to-GDP ratios are well below those of its European peers (see Figures 17 and 18).

[17, 18] Source: DESTATIS, INSEE, Istat, INE, Eurostat, BEA, as at 10 December 2024.

Figure 16: Public investment has been much lower in Germany than comparable peers[19]

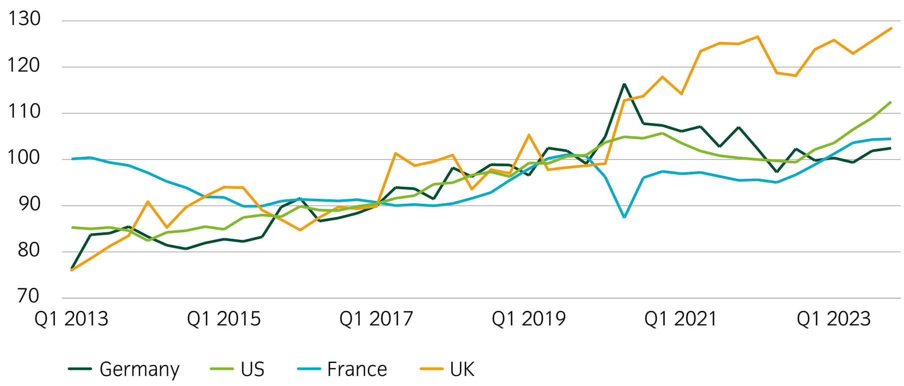


Figure 17: Net government borrowing is much lower for Germany (% of GDP)…[20]

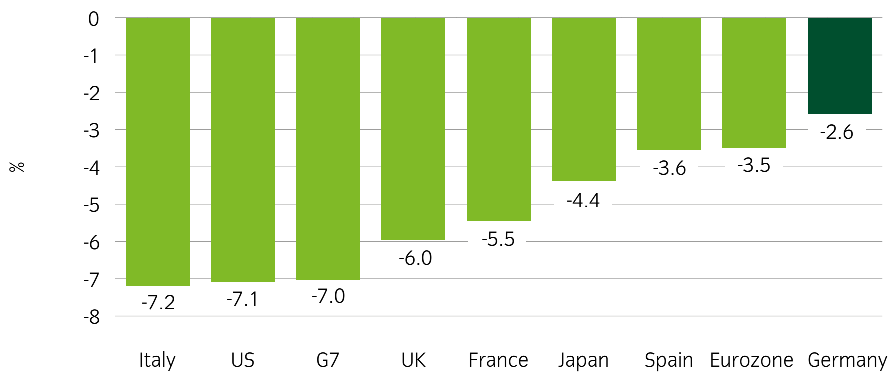
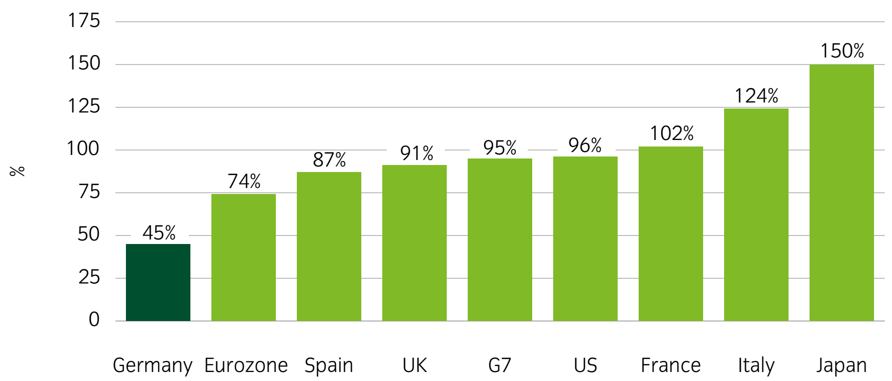


Figure 18: …as is net government debt (% of GDP) suggesting Germany has significant headroom to increase spending[21]



[19] Source: OECD, as at 10 December 2024. Rebase 2019 = 100.
[20, 21] Source: Source: Macrobond.

POLITICAL PRESSURES: HOW A NEW GOVERNMENT COULD FACE THESE CHALLENGES

These considerations underscore the challenges facing German policymakers. It would be a mistake to assume that Germany is incapable of reform. Even the ideologically diverse coalition of the last government demonstrated the ability to take decisive action when necessary. For instance, they managed the switch from Russian gas to alternative sources much faster and with less disruption than anyone anticipated. Additionally, they increased defence spending and supported the defence industrial base following the Russian invasion of Ukraine.

A NEW GERMAN GOVERNMENT CAN BE EXPECTED TO DRIVE REFORM

Following the collapse of the 'traffic light' coalition government (comprising the SPD, FDP, and Green parties), Germany is gearing up for an election on 23 February 2025. German elections are highly proportional for parties that exceed the 5% vote threshold. The traditional centre-right Union (consisting of the CDU party and the CSU party in Bavaria) is projected to be the clear winner, benefiting from an anti-incumbency trend seen in many developed-market elections in 2024.

A key question for the next Bundestag is whether the fiscally conservative FDP will surpass the 5% vote threshold. In some previous elections, there was tactical support for the FDP from CDU/CSU voters when the FDP was seen as a realistic coalition partner for the Union, but this does not seem to be the case this time. A Union/SPD coalition is the most likely outcome, but if the FDP does not reach the Bundestag, the Union will also have the option of a coalition with the Greens.

The SPD is likely the Union's preferred coalition partner, but having an alternative option will increase their negotiating power. Notably, without the FDP, the Union/SPD/Greens combined will likely exceed the two-thirds share of MPs needed to amend the constitution, which would be necessary to adjust the debt brake.

Table 1: Projected outcome of German election (based on Nov 2024 polls)

	% of seats in Bundestag	
Parties	Without FDP	With FDP
Union (CDU/CSU)	39%	36%
AfD	22%	21%
SPD	18%	18%
Green	13%	13%
BSW	8%	7%
FDP	-	6%
Coalitions		
Union/SPD	**57%**	**54%**
Union/Green	**52%**	49%
Union/FDP	-	42%

It therefore seems likely that a two-party coalition will come to power, and so significant change to policy could be easier.

POLICY IMPLICATIONS OF A NEW GERMAN GOVERNMENT

A new German government will likely oversee debt brake reform, increased defence spending, and an overhaul of energy and industrial policy, though this would occur against a backdrop of uncertainty regarding wider EU integration.

- An amended debt brake – enabling higher public spending

  The German balanced budget amendment, known as the debt brake, has been part of the constitution since 2016. It limits the federal structural deficit to 0.35% of GDP, except during times of recession or national emergency. While exceptions have been made for pandemic relief and defence spending, the constitutional court has blocked the repurposing of these funds for other uses.

  Friedrich Merz, CDU leader and likely the next German chancellor, has indicated flexibility in amending the debt brake to exclude defence and capital investment from the calculations. This adjustment is expected to be a key part of coalition negotiations following the election. However, this flexibility will likely be balanced by reductions in social spending.

  The debt brake will be amended, not abolished. Consequently, while there will be higher German issuance of debt, likely leading to steeper curves and tighter swap spreads, there is a limit to how far any German government will go. Therefore, we expect total deficits and debt-to-GDP levels to remain lower than those of many other countries.

- Increased defence spending

  After many years of underinvestment in defence, German defence spending increased to the NATO target of 2% of GDP in 2024. There is now broad understanding amongst mainstream politicians and the general population that Germany and the EU are in a second cold war against Russia, potentially without US support this time. Consequently, defence spending and production need to return to Cold War levels.

  This is not a quick process, but it is happening and will continue. It remains an open question whether defence spending will remain at the national level or move to common EU-level funding. It will most likely fall somewhere in between, with EU-funded loans for national spending on defence and support for a common defence industrial base.

- Ongoing reform of energy and industrial policy

  German energy prices remain approximately double the levels they were before the Russian invasion of Ukraine. A ceasefire is unlikely to lead to a significant resumption of Russian gas deliveries to Germany, so the country will likely seek other ways to diversify its energy sources. A revival of nuclear energy seems plausible, especially if the Greens are not part of the next government. Additionally, planned closures of coal-fired power stations are likely to be postponed. The further roll-out of renewables at a reasonable cost will depend on maintaining functional trade relations with China, and energy taxes are likely to be lowered further.

- Ongoing uncertainty regarding EU integration and leadership

  Chancellor Scholz never quite achieved the gravitas that his predecessor, Chancellor Merkel, projected on the EU stage. While Merz will undoubtedly have grand ambitions, it remains to be seen whether he can realize them.

  The Draghi report outlined a comprehensive plan for revitalising the EU economy, but making significant progress towards EU integration in areas such as capital markets, defence, and energy will be challenging amidst ongoing geopolitical crises, trade disputes, and political instability in other EU countries.

Such areas for policy reform present a significant opportunity for Germany to revitalise its economy, offsetting the headwinds to growth. However, their success could depend in large part on developments in the EU and beyond.

CONTRIBUTORS

Gareth Colesmith
Head of Global Rates and Macro Research
Insight Investment

Harry Jones
Analyst
Insight Investment

Alberto Moscardo
Graduate Analyst
Insight Investment

Phil Craig
Co-Head of Investment Content
Insight Investment

FIND OUT MORE

Institutional Business Development
businessdevelopment@insightinvestment.com

European Business Development
europe@insightinvestment.com

Consultant Relationship Management
consultantrelations@insightinvestment.com

North America Business Development
inquiries@insightinvestment.com

Australia Business Development
insightau@insightinvestment.com

company/insight-investment

www.insightinvestment.com

IMPORTANT INFORMATION

Material in this publication is provided for general information and educational purposes only and should not be relied upon as a forecast, research, advice (including investment, legal, tax advice or otherwise) or a recommendation to buy or sell any securities or adopt any investment strategy. Nothing herein constitutes an offer or solicitation in any jurisdiction where such activity would be unlawful or otherwise not permitted.

This content may include forward-looking statements, projections, or opinions based on current market conditions. Such statements are not guarantees and are subject to change without notice. Past performance is not indicative of future results, and investment values may fluctuate, including as a result of exchange rate movements.

Information is derived from sources believed to be reliable but is not guaranteed as to its accuracy or completeness. To the extent this document includes information or content provided by third parties, no responsibility is accepted for the accuracy of such information. To the maximum extent permitted by applicable law, Insight and its affiliates expressly disclaim all liability for any errors, inaccuracies, or omissions in this document. Neither Insight or its group companies shall be liable for any loss or damage (whether direct, indirect, special, or consequential) arising from the use of, or reliance on, the information in this document to the fullest extent permitted by law. Readers should seek independent professional advice before making any financial or investment decisions.

Telephone conversations may be recorded in accordance with applicable laws.

For clients and prospects of Insight Investment Management (Global) Limited: Issued by Insight Investment Management (Global) Limited. Registered in England and Wales. Registered office: 160 Queen Victoria Street, London EC4V 4LA; registered number 00827982.

For clients and prospects of Insight Investment Management (Europe) Limited: Issued by Insight Investment Management (Europe) Limited. Registered office: The Shipping Office, 20-26 Sir John Rogerson's Quay, Dublin 2, D02 Y049. Registered in Ireland. Registered number 581405. Insight Investment Management (Europe) Limited is regulated by the Central Bank of Ireland. CBI reference number C154503.

For clients and prospects of Insight Investment International Limited: Issued by Insight Investment International Limited. Registered in England and Wales. Registered office 160 Queen Victoria Street, London EC4V 4LA; registered number 03169281.

Insight Investment Management (Global) Limited and Insight Investment International Limited are authorised and regulated by the Financial Conduct Authority in the UK.

For clients and prospects based in Singapore: This material is for Institutional Investors only. This documentation has not been registered as a prospectus with the Monetary Authority of Singapore. Accordingly, it and any other document or material in connection with the offer or sale, or invitation for subscription or purchase, of Shares may not be circulated or distributed, nor may Shares be offered or sold, or be made the subject of an invitation for subscription or purchase, whether directly or indirectly, to persons in Singapore other than (i) to an institutional investor pursuant to Section 304 of the Securities and Futures Act, Chapter 289 of Singapore (the 'SFA') or (ii) otherwise pursuant to, and in accordance with the conditions of, any other applicable provision of the SFA.

For clients and prospects based in Australia and New Zealand: This material is for wholesale investors only (as defined under the Corporations Act in Australia or under the Financial Markets Conduct Act in New Zealand) and is not intended for distribution to, nor should it be relied upon by, retail investors.

Insight Investment Management (Global) Limited is exempt from the requirement to hold an Australian financial services licence under the Corporations Act 2001 in respect of the financial services; and is authorised and regulated by the Financial Conduct Authority (FCA) under UK laws, which differ from Australian laws. If this document is used or distributed in Australia, it is issued by Insight Investment Australia Pty Ltd (ABN 69 076 812 381, AFS License No. 230541) located at Level 2, 1-7 Bligh Street, Sydney, NSW 2000.

For clients and prospects of Insight North America LLC: Insight North America LLC is a registered investment adviser under the Investment Advisers Act of 1940 and regulated by the US Securities and Exchange Commission (SEC). Registration with the SEC does not imply a certain level of skill or training. The SEC has not reviewed or approved any calculation or presentation of performance results included in these materials. INA is part of 'Insight' or 'Insight Investment', the corporate brand for certain asset management companies operated by Insight Investment Management Limited including, among others, Insight Investment Management (Global) Limited, Insight Investment International Limited and Insight Investment Management (Europe) Limited (IIMEL).

16266-01-25