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Cars and the Green Transition (Part One): Germany's Model of Economic Growth

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Abstract

The electric vehicle (EV) transition portends wrenching change in Germany's export-dependent economy, with potentially severe job losses in core occupations in the automotive industry and a drastic restructuring of employment in and outside automotive supply chains. The EV transition is made even more challenging by the growing competition from Chinese (EV) producers, both in China and in the EU, and by de-globalization and renewed protectionism. The shift to EV production and the associated transformation and digitalisation of the car industry are raising existential questions and fears concerning the sustainability of Germany's macroeconomic 'model' and the associated systems of social protection and industrial relations. Can the German economy, largely focused on mechanical engineering built around cars, reinvent itself for an increasingly digitalised, electrified and geopolitically fragmented world? This paper, *Part One* of a larger economic analysis of Germany's EV transition, identifies the macroeconomic constraints that will shape the EV transition in Germany's automotive industry in the next decades. Our focus is on the fiscal and monetary policy space, industrial policy, and industrial relations and social policies. We argue that the older German model of economic growth, based on a set of mutually reinforcing 'beneficial constraints' (imposed by policies and institutions), no longer exists. Current macroeconomic policies do not support, but instead undermine, the EV transition and associated industrial transformation. German policy-making needs a fundamental reorientation toward creating space for public funding to stimulate domestic demand, provide adequate social protection, enable job mobility, build modern digital infrastructure, and deploy new technologies that are needed for the EV and larger green transition. In a separate paper (*Part Two* of our analysis), we examine the impacts of the EV transition on jobs, workers, industrial relations and firms in the German automotive industry.

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INTRODUCTION

Work Package 2 on “Green Transition, Technological Change, and Welfare Recalibration” of the **TransEuroWorkS** project analyses the labour market impacts of the green and digital transitions and, in doing so, explores possible strategies of public support to address the challenges raised by this double transition. **Task 2.2.2. of Work Package 2** consists of an analysis of the broader (macro-)economic and social effects of the green transition and its relation with digitalization. We focus our analysis on the macroeconomic and socio-economic impacts and ramifications of the green and digital transitions in Germany’s automotive industry. We zoom in on the German car industry (broadly defined) because the automotive industry is the ‘lifeblood’ of Germany’s export-dependent economy. The success or failure of the EV transition of its car industry will significantly influence the fate of the necessary green transformation of Germany’s larger economy as well as of the recalibration of its welfare state. The shift to electric vehicle production and the associated transformation and digitalisation of the industry, the larger German economy and the workplace are raising existential questions and fears concerning the sustainability of the country’s macroeconomic ‘model’ and its associated system of social protection and industrial relations.

Our analysis proceeds in two — big — steps. In **Part One** (*i.e.*, in this Working Paper), we present an in-depth, historical evaluation of Germany’s macroeconomic policy model. Our analysis identifies the macroeconomic constraints that will shape the EV transition in Germany’s automotive industry in the next decades — with a focus on the fiscal and monetary policy space, industrial policy and labour market and social policies. This leads us to the conclusion that Germany’s post-WWII model of economic growth, based on interlocking, mutually reinforcing ‘enabling constraints’ imposed by monetary and fiscal policy, pattern wage bargaining and concerted industrial relations, has morphed into a ‘pathology’ of economic stagnation, driven by overly conservative monetary and fiscal policies, deregulated labour markets and polarising wages, and a weakened industrial relations system. Without drastic reforms of its macroeconomic policies, the German economy offers not enough space to and inadequate means in support of a successful EV transition. Hence, we argue that if Germany wants to avoid the ‘slow agony’ scenario outlined by the Draghi Report (Draghi 2024), its model of economic growth needs a fundamental reorientation toward creating space for public funding to stimulate domestic demand, adequate social protection and job mobility, digital infrastructure, and the emergence and deployment of new technologies that are needed for the

EV and larger green transition. This is the analysis and diagnosis that we offer in this Working Paper (**Part One** of our analysis of Germany's car industry).

In **Part Two** of our analysis (which will be published as a separate Working Paper), we examine the German automotive industry and the impacts of the EV transition in this sector on workers and firms. We assess the importance of Germany's automotive industry to the country's macroeconomic performance, presenting present new (input-output model-based) estimates of the car industry's (direct and indirect) contributions to GDP, employment, aggregate profits and exports. We discuss the car industry's centrality to Germany's system of innovation, its role as a provider of good, relatively well-paid jobs, and its central position in Germany's system of concerted industrial relations. We pay detailed attention to the globalisation strategies of German automotive corporations, their offshoring to Eastern Europe and their strong reliance on and involvement in the Chinese market — and we analyse how Germany's car producers are now struggling with the two simultaneous challenges: (a) growing geopolitical tensions and fragmentation of global supply chains, growing Chinese (electric) car production, and a considerable loss of market share in China; and (b) the uncertain and costly EV (and digital) transition in the EU.

We then review the extant research on the implications of the ongoing transition from combustion engines to (digital) electromobility for value creation, (net) employment, and job inequalities in the German automotive industry from a political-economy perspective. Our focus in **Part Two** of the analysis is on two factors shaping the EV transition: the financialization of the automotive corporations (the rise of shareholder power at the cost of union influence) and the tradition of negotiated change in the automotive industry, that is embedded in the larger 'German model' of industrial relations. We examine to what extent the historical and institutional strength of Germany's industrial relations system can be made to work *in support of* the transition to EVs, and to what degree the transition may be hindered by the financialization of Germany's car manufacturers. This will help us to better understand the labour market impacts of the EV transition on the German welfare system in the context of globalization (the new China Shock), digitalization, and a green transition. In the conclusions, we contextualise the EV transition within the larger macroeconomic context and focus on the role of the German government and the Bundesbank in backing the transition to EVs and funding supportive industrial and social policies.

“Wir fahr'n, fahr'n, fahr'n, auf der Autobahn
Wir fahr'n, fahr'n, fahr'n, auf der Autobahn
Wir fahr'n, fahr'n, fahr'n, auf der Autobahn
Wir fahr'n, fahr'n, fahr'n, auf der Autobahn”
— Kraftwerk (1974)

1. THE POLITICAL ECONOMY OF ELECTRIFICATION

Germany has long been hailed for its superior model of capitalism, founded on medium- and high-tech export-oriented manufacturing (Lindlar and Holtfrerich 1996), a strong innovation system, skilled workmanship and good design (Streeck 1989); stable, long-term funding arrangements between businesses and banks (Halevi 1995; Deeg 1999; Behringer and van Treeck 2019); a relatively cooperative system of industrial relations with responsible labour unions that balance the needs of workers with those of the firms, the larger industry and the macroeconomy (Thelen 1991); a network of medium-sized (‘Mittelstand’) companies, many of them family-owned and deeply embedded in regional supplier networks (Welter *et al.* 2015); well-functioning infrastructure; price stability; and a top-notch system of vocational and technical training that ensures a steady supply of skilled, productive workers (Streeck 1989). Its export-oriented model of capitalism has enabled Germany to run a large trade surplus and to have sound relatively public finances and relatively low unemployment (Baccaro and Benassi 2017).

The German automotive industry has been the heart of this model of capitalism. Directly or indirectly, it accounts for around 6% of GDP and sustains more than 1.6 million mostly well-paid jobs. The German car industry produces roughly 50% of the European value added in motor vehicle manufacturing (Falck and Kaura 2023). The backbone of Germany’s car industry is made up by about 1,200 small and medium-sized part suppliers which make components like fuel tanks, gearboxes or exhaust systems and the machine-tools used in the automotive industry. Cars (and car parts) are Germany’s most important export product, accounting for 17% of Germany’s export earnings in 2023. The car industry is central to Germany’s much-vaunted social model and it also undergirds Germany’s model of co-determination (Dupuis *et al.* 2024),

where workers are guaranteed representation on corporate boards. The car industry's interests also have considerable political clout (Brand and Wissen 2021).¹

1.1. Germany as an Industrial Nation is Losing Ground

But Germany's economy and its mighty automotive industry find themselves in the middle of a perfect storm: stagnating productivity, lagging digital innovation, an ageing population and the double load of digital and green transitions put the German model at risk. The German car industry is particularly threatened. Germany's automotive industry is struggling with a lasting competitive disadvantage, caused by the increase in prices of fossil fuels that have raised production costs compared to competitors in China and the United States.

² In fact, the **International Energy Agency** (IEA 2024) [estimates](#) that in 2023, electric power in Europe cost twice or thrice as much as in the US and China.³ This hurts Germany's (energy-intensive) car producers and the risk of a creeping migration of German production and investments will continue to grow.⁴

On the other hand, German car manufacturers have been slow — so far — in responding to the need for a transition to electric vehicles and are now struggling with a significant contraction of the global and European market for conventional cars. Building battery electric vehicles

¹ The deep involvement of Germany's automotive firms in China has long been a main driver of Berlin's China policy. Similarly, the interest of German car makers in cheap energy from Russia has been a factor in the country's relations with Moscow.

² The German government proposes to pay billions of euros as subsidies to companies setting up hydrogen-fired power plants. This hydrogen plan — the *Kraftwerksstrategie* — is part of a move to phase-out coal plants (already by 2030) and to complement the use of large volumes of wind and solar generation. However, there is no academic or industrial consensus on hydrogen storage as the solution to seasonal energy variations. Hence, supporting hydrogen-fired turbines exclusively may not be the smartest use of the German climate-investment budget (McWilliams and Zachmann 2024).

³ This is the outcome of a bad bet. For years, the EU — and Germany specifically — relied on cheap Russian gas to power European industry. Now European/German industry is instead forced to rely on expensive LNG from the US and oil from the politically unstable Middle East. The higher power prices are contributing to the deindustrialisation of the EU and Germany.

⁴ However, gas (and electricity) prices in the EU may come down in the longer run. According to IEA (2024) forecasts, global LNG markets may be heading towards an unprecedented glut of gas supply, especially of LNG. As a result, the price of LNG imported into the EU may fall from a record average high of more than \$70 per million British thermal units (MBtu) in 2022 to just \$6.50 by 2030.

(BEVs) is vastly different from building internal combustion engine vehicles (ICEVs). Chinese EV producers and Tesla have designed their electric cars from the ground-up to be battery-powered. The German brands largely opted to take their existing models and make them electric — which has led to serious adjustment problems. In a sense, BEVs are as much software as they are cars, but software is usually considered one of Germany's weaker areas.⁵ Indeed, Volkswagen's BEV programme [was delayed for years](#) by faulty software and still launched with hundreds of bugs. In December 2024, it was revealed that privacy-sensitive location data from 800 thousand Volkswagen BEVs were stored on Amazon servers without serious protection; and the company didn't even know about it (Beuth *et al.* 2025).

It is therefore not surprising that Chinese-made EVs are set to take 25% of the European market for electric vehicles in 2024. German firms are also rapidly losing market share in China itself. This is important, because German automotive sales growth in the 2010s was driven by the Chinese market; in the second half of 2022 Germany's three big car companies made around 40 per cent of their revenue there (Puls 2024). However, in 2022, Volkswagen lost the top spot in Chinese sales to BYD, a homegrown brand, for the first time. In BEVs other than Tesla, the top ten brands in China are all local. If this trend continues as China approaches its EV goals, that portends poorly for Germany's automotive industry — it just won't be able to keep up.

No German manufacturer currently has an electric car on the market that costs less than €25.000 and most prices are well over €30.000. Volkswagen has no plans to bring cheaper electric vehicles back onto the market until 2026.⁶ Meanwhile, Mercedes and its Chinese partner Geely keep adding extras to the E-Smart, only making it more expensive. EVs produced by German car manufacturers remain mostly affordable to only those with higher incomes.⁷ In addition, the current recessionary environment and high and volatile energy prices discourage car buyers to shift to EVs. In contrast, in China, BYD, which started out as a battery manufacturer in 1995,

⁵ This is a general European problem: all the relevant innovation indicators confirm the EU's digital backwardness (UNCTAD 2021; Stöllinger and Guarascio 2024).

⁶ The e-up!, a compact bestseller for years, was taken off the market by Volkswagen in 2023 — allegedly because it was no longer profitable. German demand for EVs has decreased after the federal government abruptly removed subsidies on electric vehicles in 2023. Volkswagen has since been trying to reduce its stock of more expensive e-models by offering considerable discounts.

⁷ This is having a political fallout. In Germany, the far-right *Alternative for Deutschland* (AfD) party is waging a cultural war against the electric car, weaponizing it as a symbol of a sinister elitist plot to impose a green transition on society that will increase the cost of transport, lead to large job losses, and cause a loss of freedom of mobility and individual choice. See [Jolly \(2023\)](#).

is already selling an affordable mass model at a competitive price of less than €10.000. The BYD Seagull will soon be available in Germany. The price tag is likely to be higher than it is in China⁸, but even at €20.000, the Chinese would still be undercutting all German manufacturers ([Book et al. 2024](#)).

None of the batteries used by German car manufacturers rely primarily on German technology (Khalaf 2024). Even if some batteries are being made in Germany through joint ventures, the technology is owned by American and Asian companies (such as CATL, the largest Chinese battery manufacturer).⁹ The core intellectual property is not German, and the value will mostly accrue outside Germany. Northvolt, a Swedish EV battery manufacturer that both Volkswagen and BMW had invested in, has gone bankrupt, making German car producers even more dependent on Chinese firms and expertise.¹⁰

Furthermore, the basic car platforms are different. BEV chassis are designed around placing the extremely large and heavy battery pack on the bottom of the car, under its floor. This change in the basic design of car will make obsolete the billions of Euros invested in current (ICE) vehicle platforms with different design assumptions. *The Economist* [reports](#) that Volkswagen will have to create an entirely new chassis platform, which it will not fully roll out until 2030. That means that much of Germany's nearly century-old investments in mechanical-engineering expertise, skills and production capacities must be replaced, reducing Germany's otherwise huge first-mover advantage (The Economist 2021).

The Federation of German Industries **BDI** (2024) warns that 20 per cent of Germany's industrial value creation is at risk — particularly in industries such as automotive, chemicals and energy-intensive sectors — unless high energy costs, labour shortages, bureaucracy and under-investment in critical infrastructure (notably transport and digital networks) are addressed. According to the car industry association **VDA**, the EV transition could cost 190.000 jobs by 2035¹¹; of the 10 largest occupational groups in the automotive industry, 7 are among those

⁸ Chinese cars are likely to be below EU safety standards and to require some modification, which will raise their price.

⁹ Asian firms including CATL, BYD, and LG Energy Solution and SK On of South Korea, control about 70 per cent of the global EV battery market (Khalaf 2024).

¹⁰ Many of the 30 gigafactory projects in Europe have also been designed and built with the help of Chinese and Korean companies (Khalaf 2024).

¹¹ These estimates are based on a study by [Prognos \(2024\)](#).

with the largest expected job losses; jobs in mechanical engineering and industrial engineering as well as in metalworking in particular will lose relevance in an EV future ([VDA 2024](#)).

Already in 2020, the EU introduced stricter emissions regulations for cars and proposed a ban on the sale of internal combustion engines by 2035. These regulations which became effective with **EU regulation 2023/851** in 2023, intend to decrease CO₂ emissions of new cars.¹² The future of Germany's automotive sector thus depends largely on whether German manufacturers will succeed in electromobility. This requires establishing a strong European domestic market for e-cars, building a competitive battery value chain, and investing in digitalization and software expertise.

The laggard German automotive industry is now facing the biggest industrial transformation in more than a century. The impending transition to electric platforms annihilates a core source of differentiation that has, so far, allowed the German industry to maintain (oligopolistic) pricing power and sales dominance (based on brand reputation) and this loss will cause structural adjustment problems for Germany's wider mechanical engineering 'Mittelstand'. To face off the threat and in order to keep up with Chinese and the US competitors, German car manufacturers will have to invest billions of Euros in the development and production of greener, electric, vehicles. The **BDI** estimates that German firms and the German state need to invest €1.4 trillion by 2030 to strengthen the economy's industrial base and stay competitive in the global market (BDI 2024). While private finance should play the biggest role according to **BDI**, the added annual fiscal burden (in constant 2023 prices) for the German government is still significant, amounting to € 42 billion in 2025 and €71 billion in 2030 (BDI 2024), or around 1% to 1.5% of Germany's GDP. This poses challenges for Germany's fiscal policy stance which is founded on the "Black Zero", a structural policy commitment to a balanced budget (Bofinger 2024).¹³

¹² However, the EU rules leave loopholes for greenwashing; for instance, real-world emissions of PHEVs are on average three to five times higher than the stipulated norms, because, on average, private PHEVs are driven as electric vehicles only 45-49% of the time (Keil and Steinberger 2024, p. 93).

¹³ German opinion on the usefulness of the constitutional debt brake is — slowly — changing. Bundesbank president Joachim Nagel recently urged Berlin to relax rules to address defence and infrastructure shortfalls ([Storbeck and Jenkins 2024](#)).

1.2. Wrenching Change in Germany's Automotive Industry

The accelerating EV transition portends wrenching change, not just in the German economy, but also elsewhere in Europe and the world, with potentially severe job losses in core occupations, rapid devaluation of existing engineering skills and almost certainly accompanied by drastic economic decline in regions that are currently dependent on the automotive industry (Hancké & Mathei 2024). To some observers, the German car industry, which has a strong presence of the workforce in economic and corporate decision-making, appears well placed to successfully navigate and negotiate the difficult EV transition (Dupuis *et al.* 2024), broadly along the lines of a ‘just transition’ and based on the same post-WWII path of cooperative incremental innovation that had made German cars with internal combustion engines the envy of the world. However, this time might be different.

The reason is that the change this time is not incremental: BEVs embody in many ways a significant break with existing ICEV technologies and skill profiles, as explained above. Germany's engineering advantages in ICEVs will be of much less value and use in the new age of BEVs which rely on fewer parts and shorter supply chains and often lower-skilled workers (Hancké & Mathei 2024). Key German car makers and the car industry association **VDA** are not without reason feeling a real “Angst” that German car manufacturing will fade: high production cost, falling demand for Germany's conventional cars, and growing competition, especially from Chinese electric vehicles' producers, are depressing business confidence and investment in Germany.¹⁴ At the same time, the EV transition is heavily disputed within German automotive circles, up to the point that the employers' associations are unable to develop a constructive consensus, and representative bodies of workers in the car industry (e.g., the industry union **IG Metall** and the works councils in the large companies) find themselves at odds over an electric future.

According to Hancké and Mathei (2024), organised labour in Germany has become divided in two adversarial camps, pitting company-based works councils against industry-wide unions.

¹⁴ Volkswagen will cut 35,000 jobs in Germany during 2025-2030 (Nilsson 2024). Bosch, the car parts manufacturer, plans to lay off 5,550 employees in Europe and around 3,800 of the layoffs are to be made in Germany ([Reuters 2024a](#)). Ford announced that it will cut around 14% of its European workforce, blaming losses in recent years due to weak electric vehicle demand, poor government support for the EV shift and competition from subsidized Chinese rivals ([Reuters 2024b](#)). The 4,000 jobs at Ford will be cut primarily in Germany and Britain.

This makes unified interest representation difficult. On the one hand, there are workers employed in the established car manufacturers, mainly producing ICEVs, and their colleagues with parallel ICEV-related skills among suppliers in the rest of the industry (essentially all firms producing parts related to the drive train). This ICEV-related workforce has become increasingly represented by the company-based works councils, which tend to put the future of the company first and defend the interests of this workforce. It has been difficult to persuade the ICEV-related workers whose skill-profile is ICEV-technology-specific, to support the EV transition, with many fearing significant employment *losses* and a structural deterioration of work conditions.¹⁵

On the other hand, there are employees with relatively more general, adaptable and portable skills, working in the supplier networks, for example working in software engineering, machine maintenance, seat manufacturers and interior design, which are mostly functions that will survive the EV transition; in fact, the electric transition may yield strong advantages to this category of employees, including a strengthening of their rights. These workers voice their interests through the industry union **IG Metall**, favouring a just transition, with retraining and income support, to secure competitiveness and high employment (Hancké and Mathei 2024).^{16,17}

¹⁵ For instance, Michael Häberle, member of the supervisory board of Mercedes Benz and head of the Works Council at the plant in Stuttgart's Untertürkheim district, urges caution on the subject of EVs. The EU is “currently the only economic area that has decided to ban combustion engines,” and he argues that Mercedes must be in a position where it can ramp up production of combustion cars or more electric vehicles, depending on the market situation. See [Book et al. \(2024\)](#).

¹⁶ Jointly with two other unions, IG Metall launched the “Arbeit 4.0” campaign as a direct response to “Industry 4.0” strategies promoted by leading manufacturing firms and the federal government, aiming to accelerate the shift to digital manufacturing and value chains. In October 2021, IG Metall mobilised 50,000 members for a nationwide action day to support workers in the green and digital transformation of manufacturing. The union demanded “safe bridges into the working world of tomorrow”, “sustainable jobs and secure training”, “public investment in (digital) infrastructure” and a “solidaristic sharing of the burden of adjustment” (Dupuis et al. 2024).

¹⁷ See Keil (2024) for a short history of **IG Metall**’s engagement with ecology and sustainability since 1972 (when the “Limits to Growth” Report was published).

Not unlike labour, Germany's automotive capital is also deeply split on the EV transition according to Hancké and Mathei (2024). In their view, *Dieselgate*¹⁸ drove a deep wedge through the industry. In fact,

“Independent luxury car producers (Mercedes and BMW) paid their fines and reverted to the production of cleaner ICE cars. Volkswagen, the only remaining German car manufacturer in the mass segment, resolutely turned in the direction of low- and zero-emissions vehicles, with large-scale investment in electromobility” (Hancké and Mathei 2024, p.142).

This divergence between Germany's major car producers¹⁹ eliminated the economic foundation for the cohesive representation of the car industry's collective interests through the Association of the German Automobile Industry (VDA). As Hancké and Mathei (2024, p. 142) conclude:

“The VDA's policies on EVs remained modest as a result, tending towards a lowest common denominator entailing both electric cars and a lifeline for ICEVs through synthetic fuels. The split ultimately led to a situation in which the industry effectively chose to forego agreement on common standards for basic but crucial EV-related functions such as batteries and charging infrastructure – almost certainly a significant own goal, since German standards in this new field would likely have been the basis for global standards, with future benefits even for the initially non-EV oriented car companies.”

In short, car producers and organised labour are divided on how to face the challenges posed by the shift to electrification and ‘software-defined cars’ — and, because the German government traditionally followed a relatively ‘hands-off’ approach in questions of industrial policy (Germann 2023), the broader green transition has acquired an ambiguous, “stop-go” character — and (so far) lacks a unified strategy backed by a strong enough coalition of employers and unions in favour of electrification (Hancké and Mathei 2024).

¹⁸ In the ‘*Dieselgate*’ scandal, leading German car producers were caught installing cheat software in diesel engines that not only could detect when they were being tested, but also was able to falsify CO₂ emission tests accordingly to improve results.

¹⁹ Daniela Cavallo, the chair of the VW Works Council, warns against delaying the EV transition, because moving away from the fossil fuel phase-out “would be fatal and a threat to the entire economy.” Achim Dietrich, chair of the works council at car parts supplier ZF Friedrichshafen, concurs, arguing that e-mobility will prevail in the end anyway. “And if we don't manage to build the best electric cars, the Chinese will.” In contrast, Mercedes-Benz CEO Ola Källenius, who until recently wanted to go all-electric, is now suddenly questioning the EU's decision to phase out ICEVs by 2035. See [Book et al. \(2024\)](#).

Production of motor vehicles and motor vehicle parts in Germany peaked in 2017 and has declined considerably since then. Averaged across 2023, it was 15% lower than in 2017 (Bundesbank 2024a). The number of passenger cars produced in Germany fell by more than a quarter between 2017 and 2023. The number of domestically produced passenger cars with an internal combustion engine declined particularly sharply during this period, by almost half; exports of combustion engine vehicles fell by roughly two-fifths during this period (Bundesbank 2024a). The capacity utilization rate of Germany's automotive industry has dropped to around 78% during the third quarter of 2024 (Ifo 2024), which is 9 percentage points below the long-term average rate of capacity utilisation of 87% (for the period 1991-2023). This decline is attributed to automakers, including Volkswagen Group, reducing production at high-cost plants and complaining about insufficient orders. According to Ifo (2024), the business expectations index for Germany's automotive industry has been negative during 2023 and 2024.

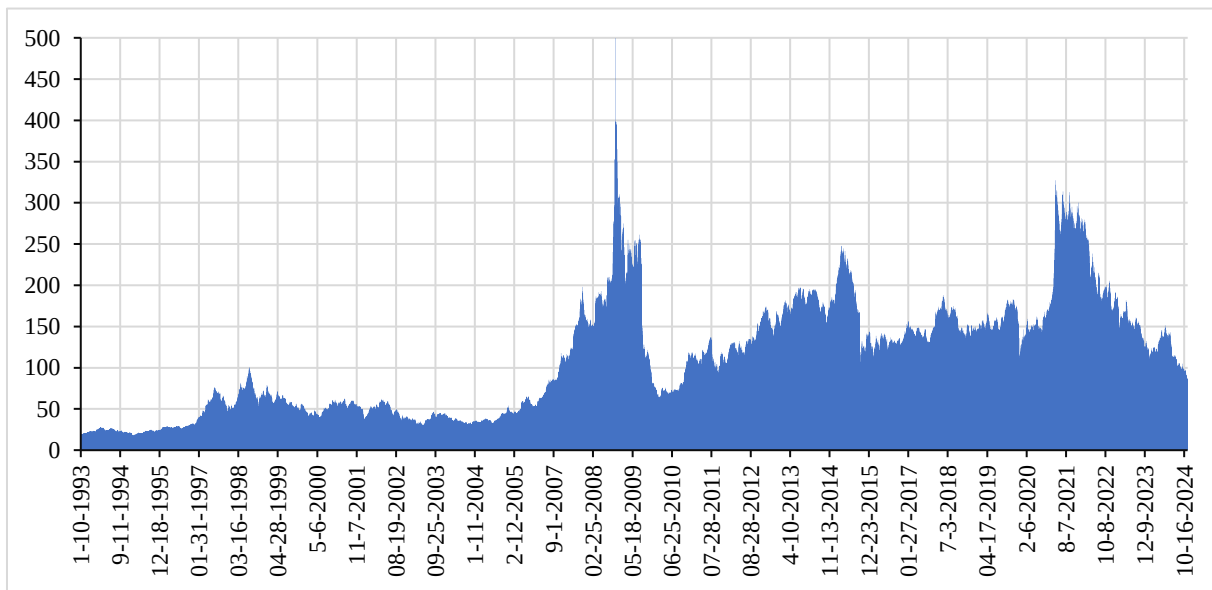
In September 2024, Volkswagen Group let it be known that it might need to shut down two factories in Germany, for the first time in its 87-year history ([Klößner 2024](#)). The announcement led to industrial action: tens of thousands of workers at nine Volkswagen car and component plants across Germany started two-hour strikes on December 1, 2024, demanding that Volkswagen guarantee their jobs and keep its factories open ([Eddy 2024](#)). In December 2024, after more than 70 hours of negotiations, Volkswagen and **IG Metall** reached an agreement that will lead to more than 35,000 future job cuts by 2030 and sharp capacity reductions involving the closure of VW's Dresden's plant, repurposing the Osnabrück plant, shifting some production to Mexico, and closing two assembly lines (out of four) at VW's Wolfsburg plant (Nilsson 2024). However, the closures would not involve compulsory redundancies while the problem of structural overcapacity would be addressed.²⁰ The overcapacity is caused by a decline in the demand for Volkswagen cars — by around 500.000 cars per year (Nilsson 2024) — primarily due to a collapse of sales in China and the growing share of the European car market of Chinese EV producers.²¹ The share price of Volkswagen

²⁰ “No site will be closed, no one will be made redundant and our in-house collective bargaining agreement will be secured in the long term,” VW's works council leader, Daniela Cavallo, said (Nilsson 2024).

²¹ It is not just Europe's biggest carmaker Volkswagen that is facing potential factory closures — French carmaker Renault and Italy's Stellantis are also producing significantly more cars than they can sell. According to business data and research company Bloomberg Intelligence, one in three European factories of car-making behemoths like BMW, Mercedes, Stellantis, Renault and Volkswagen is underutilized.

AG has plummeted from a value of circa €290 in the first half year of 2021 to €85 in November 2024, which is a decline by 70% (see **Figure 1.1**). Volkswagen’s move to shutter factories in its German homeland pulls at a thread that could see a decades-long deal between German workers and their employers unravel. If it does, Germany’s productivist industrial relations system will be upended.

Figure 1.1
Volkswagen AG Ordinary Share Price, Daily, 10/01/1993 - 11/18/2024
(Euros per Share; Current Prices)



Source: Volkswagen A.G. Share Price Dashboard;
<https://www.volkswagen-group.com/en/share-details>

For many, the crisis at Volkswagen is a wake-up call. It has already shaken the company and the unions, and has been described as an earthquake by some in the German media ([Connolly 2024](#)). “Germany was once an economic model to emulate but its reliance on industries past their sell-by date is costing it dear,” writes *The Guardian* (Elliott 2024), adding: “The German problem? It’s an analogue country in a digital world”. The crisis is an existential one: what would the German economy be without the car industry? “What if Germany stopped making cars?”, asked *The Economist* (July 31, 2023). Can the German economy, now largely focused on mechanical engineering built around cars, reinvent itself for an increasingly digitalised and

In some of their plants, less than half of the vehicles that could theoretically be produced are actually being made ([Kohlmann 2024](#)).

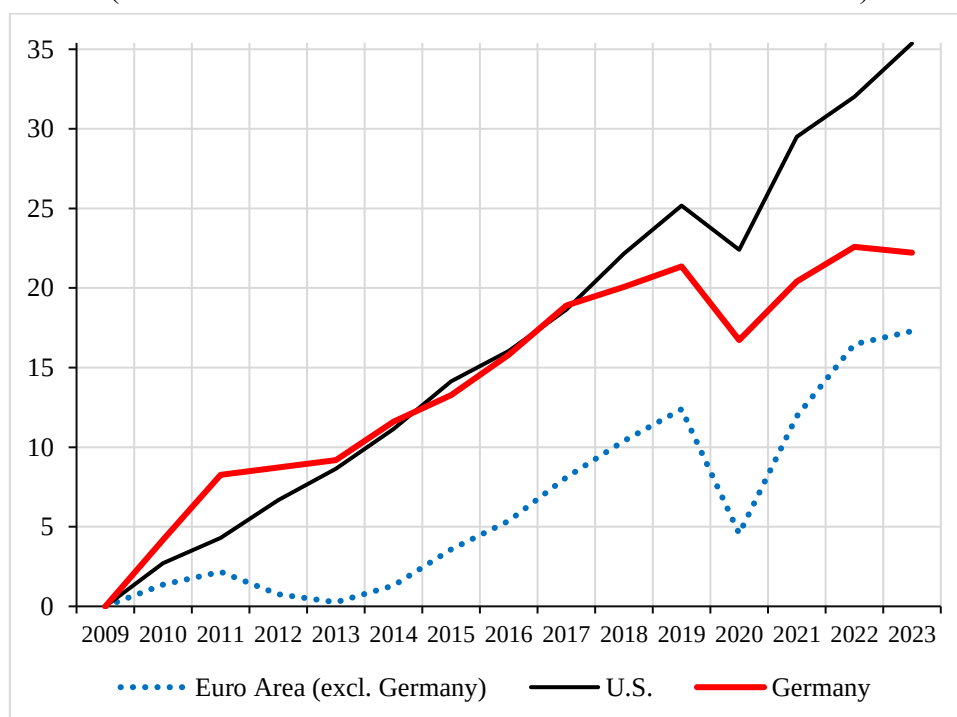
geopolitically fragmented world? The question is important not just for Germany, but for the Eastern European car (parts) industries as well.

1.3. The Draghi (2024) Report on European Competitiveness

At the core of Germany's dilemma is the fear of long-term economic decline. The country is struggling to respond to the increased protectionism around the world, the growing geopolitical fragmentation, the realities of climate change, structurally higher energy prices, and the move to a more state-led, nationalistic capitalism in the US and elsewhere. Germany's energy-intensive industrial base is ageing, having largely missed the boat on the wave of investments in new digital (platform) technologies during the past two decades, and the German economy has been suffering from chronic underinvestment in almost every industry. The growth performance of Germany and the larger Eurozone economy is poor. As is shown in **Figure 1.2**, since the 2008-09 financial crisis, Europe's real GDP has failed to keep pace with that of the United States. Real GDP of the US rose by 35.4% during 2009-2023, compared to 22.2% in Germany and 17.3% in the Eurozone (excluding Germany).

Figure 1.2

Germany and the Eurozone Are Falling Behind the US
(Percent Increase in Real GDP Relative to Base-Year 2009)



Source: Authors' estimations based on AMECO data.

The Eurozone is also lagging in terms of productivity growth, which reflects a long-standing failure to match US levels of private or public sector investment. US productivity growth was recently given a boost by the massive fiscal stimulus centred on green and digital industries of the **Inflation Reduction Act (IRA)** and the **CHIPS and Science Act (CHIPS)**, as Eurozone economies received less fiscal support from governments while suffering a much bigger rise in energy prices as a result of the Ukraine war. Many technologies needed for Europe's green transition are currently produced in China, fuelling fears that the bloc's nascent post-carbon industries will be drowned by imports. Yet a European reply in the form of subsidies and tariffs has been smothered by a tug-of-war between rival industrial interests, namely between sectors in favour of protections and exporters fearful of losing market share in the event of an EU-China trade war, which include the major German car producers.²²

At the request of the European Commission, the former president of the European Central Bank (ECB) and the don of European crisis politics, Mario Draghi, has laid out a comprehensive strategy for Europe's economic revival. In a report titled *The Future of European Competitiveness*, Draghi outlines a (mostly supply-side) strategy for Europe's economic revival, including a far more integrated, bloc-wide industrial policy focused on digital and clean technology and defence, plus more rapid decision-making if the EU wants to keep pace economically with China and the US. This more proactive industrial policy will need significant additional investments up to at least €800 billion each year — around 4.7% of EU GDP for decarbonisation, digitalisation, and (according to Draghi) defence.

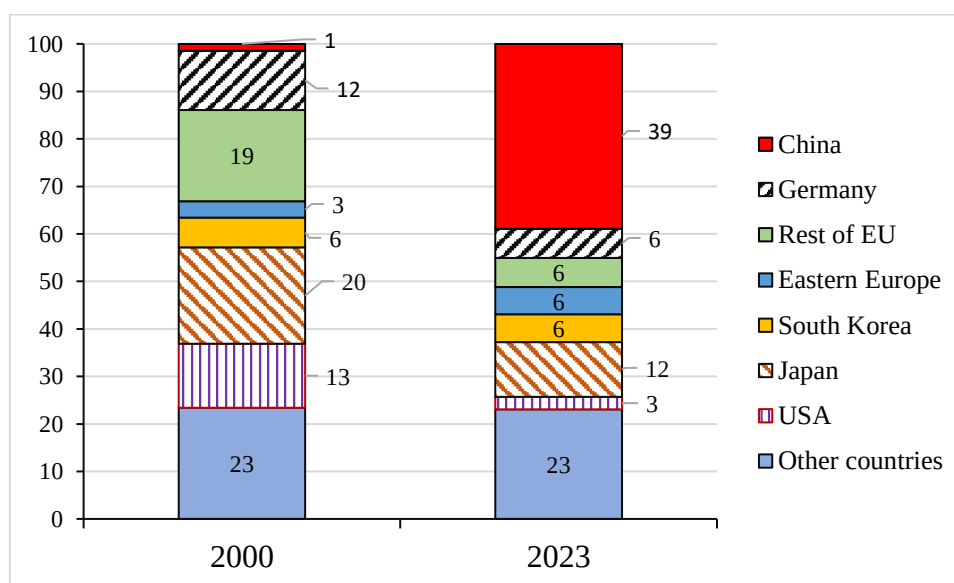
Draghi's diagnosis and the bulk of his proposals remain rooted in conventional supply-side economics, focused on improving the cost competitiveness of European industries. Key proposals include cutting 'red tape' by deregulation and a reduction of companies' reporting obligations; increased R&D spending, more education in the technology-related 'STEM' subjects; and a genuine capital-markets union to give financial investors opportunities to diversify their portfolios and lower their funding costs, a large (public and private) investment programme of €800 billion *per annum*, a common safe asset (akin to a Eurobond) and the

²² Member country rivalries also do not help. In the absence of a coordinated EU response, Hungary and Spain are competing for Chinese foreign investment in EV production. In October 2024, Spain was among 12 countries that abstained from a vote on increasing EU tariffs on Chinese EVs, while Hungary (and Germany) voted against.

channelling of private savings into venture-capital markets (Raza, Ertl and Soder 2024). Inherent in the call for a capital-markets union is a thrust for greater corporate consolidation — allowing corporations to build up the scale that is needed to hold their own against their American and Chinese competitors. But the Draghi report ignores other crucial factors driving productivity, such as fiscal and monetary policies, working conditions and wages.

Draghi’s report specifically deals with the European automotive sector. Draghi (2024, p. 142) identifies two major trends that are transforming the European car industry. The first trend is the rise of China both as a global car manufacturer and as the major consumer market for passenger cars. Chinese car producers managed to grow their share in global production to 39% in 2023, compared to just 1% in 2000 (**Figure 1.3**). As a result, all traditional car producers lost ground. As is shown in **Figure 1.3**, the share of the EU in global car production was almost halved from 35% in 2000 to 18% in 2023. The share of German car production in global production declined from 12% in 2000 to 6% in 2023. The number of passenger cars produced in the EU (Germany) has declined from 14.45 (5.1) million in 2000 to 12.1 (4.1) million in 2023. **Figure 1.4** illustrates the secular decline in the share of car production in Germany in global and EU motor vehicle production.

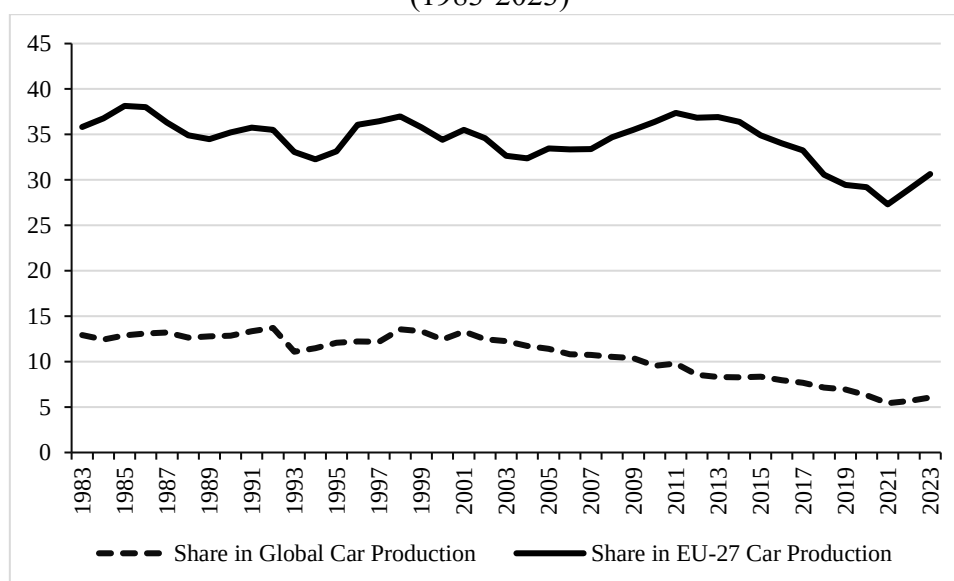
Figure 1.3
Global Shift in Car Production: 2023 versus 2000



Source: Authors’ estimations based on *International Organization of Motor Vehicle Manufacturers*, 2024. *Notes:* Eastern Europe includes the Czech Republic; Hungary; Poland; Romania; Slovakia; and Slovenia.

Vehicles tend to be produced close to customer markets to avoid trade and regulatory barriers, benefit from lower transport costs, and connect to the aftersales market. Hence, the shift in the geography of global demand away from Europe has weakened the positive impact of world demand on production in the EU in terms of value added and employment. EU vehicle exports in unit terms have fallen from 7.5 million vehicles sold abroad in 2017 to 6.3 million in 2022, a decline by 16%. During the same period, EU vehicle imports from China have increased strongly. China is now the largest source of car imports into the EU in terms of the number of cars. In 2022, China accounted for 14% of the vehicles imported into the EU, making it the biggest non-European supplier.

Figure 1.4
Share of German Car Production in Global and EU-27 Car Production
(1983-2023)



Source: International Organization of Motor Vehicle Manufacturers, 2024

The second trend is the rise of electric vehicles (EVs) — which entails the digitisation of vehicles. While automotive has traditionally been a ‘hardware-based’ mechanical-engineering industry, the added value of electric vehicles is increasingly located in software. Estimates suggest that electronics and software may represent up to 50% of a car’s value in 2030 (Draghi 2024, p. 142). The digitisation of vehicles requires new skills and infrastructure in automotive

manufacturing and mobility services — and procrastinating European and German firms are falling behind. In fact, Chinese EV producers

“are one generation ahead of Europeans in terms of technology in virtually all domains, including EV performance (*e.g.* range, charging time, and charging infrastructure), software (software-defined vehicles, autonomous driving levels 2+, 3 and 4), user experience (*e.g.* best-in-class Human Machine Interfaces and navigation systems), and development time (*e.g.* 1.5 to 2-year development time, compared to three to five years in Europe)” (Draghi 2024, p.145).²³

According to Draghi, the EU has so far not pushed for a synchronised conversion of the EV supply chain, unlike the US which has reacted to the ascent of China’s EV industry by increasing import barriers and targeted stimulus to the domestic EV value chain, particularly through producer and consumer tax credits in the IRA and the CHIPS and Science Act that provides new funding to boost domestic research and manufacturing of semiconductors in the United States. The Draghi report considers the European automotive industry too important to be exposed to unfettered Chinese competition. As such, it recommends a mixture of tariffs to protect EU industry. It also advocates changes in (vehicle) procurement practices²⁴ and massive investment in expanding the EV charging infrastructure. Draghi (2024, p. 151) concludes with a warning: “if the EU is not able to rapidly adjust to this new competitive environment, the automotive sector may lose ground at an even faster pace. According to some industry experts, even more than 10% of local EU production may be displaced in the following five years.”

1.4. A Just EV Transition?

However, the core of Draghi’s (2024) proposal for a common industrial policy — the call for direct investment in the green transition — risks running into the same political and economic dogma that has hamstrung Europe already for decades: a lack of funding because of the debt-brake built into the Eurozone’s Stability and Growth Pact (SGP), which limits public spending and outlaws collective borrowing at the level of the Eurozone. An even harsher debt brake is in operation in Germany. Freeing or mobilising the necessary public resources to fund the EV transition, a *sine-qua-non* for effectuating the EV transition, will require a fundamental

²³ Unfortunately, the Draghi report does not specify the sources of these estimates. For present purposes, we assume that Draghi’s estimates are realistic.

²⁴ This is one of few *demand-side* industrial policy tools proposed by the Draghi Report.

rethinking of European and Germany's macroeconomic policy approach — as we argue in **Section 2** for Germany. Let us note here that Draghi does not request an increased EU budget, because this would be anathema to current German opinion. Similarly, his proposal for a common debt instrument is denounced by the Germans. It thus remains unclear how Draghi's proposed annual €800 billion investment programme will be financed.

The Draghi report focuses on improving business conditions, mostly by means of deregulation, but ignores other crucial factors driving productivity and competitiveness, such as working conditions and wages and ('technology-forcing') regulation (Raza, Ertl and Soder 2024). The deregulatory agenda of the Draghi report is set in a long tradition of earlier initiatives at deregulation by the European Commission that have not worked — as the Draghi report itself recognises.²⁵ Draghi claims that his proposed reforms will help to protect the European social model, but he fails to see that most of his deregulatory agenda will actively undermine social cohesion and the welfare state. At the same time, he does not take into consideration that Europe's social model, and the corresponding regulation and social protection, can be 'productivist' and lead to innovation and productivity growth.²⁶

The Draghi report may be specific on the 'money question' of billions of private and public investments, but the report is rather vague on the 'people question' of those who need to be mobilised and how. As Hemerijck and Bokhorst (2024) argue,

“Draghi's plea to 'preserve' the European Social Model is unnecessarily defensive, as if competitiveness and productivity fall outside the purview of European welfare states in times of accelerating ageing and increased geopolitical competition. They do not: economic prosperity is a function of productivity and employment, which is precisely what a robust welfare state supports.”

The Draghi report pays insufficient attention to the 'productivist' nature of European social investment spending. Similarly, Draghi (2024) ignores the 'productivist' contribution that Europe's industrial relation system can — in principle — make to the process of structural change that is inherent in the green transition. That is, Draghi pays no attention to the political-economy dimension of the green/EV transition, ignoring (*a*) the distributive consequences of

²⁵ It reminds us of the following dictum: “Insanity is doing the same thing over and over and expecting different results,” a statement that is misattributed to Albert Einstein.

²⁶ Environmental regulation, and rules to lower CO₂ emissions in particular, have given a spur given to the development of more industrial production processes, energy-efficient cars, home appliances and buildings in countries around the world.

the electric transition; (b) the involvement of workers and/or unions in co-creating the necessary process of structural change; and (c) the institutional canvas, *i.e.*, the industrial relations system, against which the shift is taking place. These three factors interact — and their interaction will shape the course and eventual outcome of the EV transition (Hancké and Mathei 2024).

If we are serious about protecting Europe’s social model, the green/EV transition has to be just. For the purposes of this paper, we follow Hancké and Mathei (2024) and define a ‘**Just Transition**’ as “a transition to net-zero that includes measures to secure the future life chances of workers, their families, and their communities, based primarily on social dialogue between workers (and unions), employers and government”. It follows from this definition that countries, such as Germany, with a strong presence of the workforce in economic and corporate decision-making are, *in principle*, likely to experience a successful transition to EVs. Germany’s concerted industrial relations system is, in principle, capable of balancing the interests of workers, companies, and the macroeconomy, taking the distributive effects of the transition into account, overcoming cleavages between industries and between capital and labour. And by involving workers, it could help smoothen the technological, industrial and labour force restructuring that comes with the transition — supported by adequate public spending on retraining, building digital skills and support for worker relocation. Dupuis *et al.* (2024) explain how this could work:

“When new jobs are created inside the strongholds of union power, union members can often avoid unemployment by securing their jobs or transferring to other jobs in the same plant or company. Trade unionists can put pressure on, or partner with, the management to help workers pursue internal redeployment or attract investment in existing plants. Their ability to navigate corporate politics, however, depends on the rules governing worker participation, plant closures, and mass layoffs. [...] In Germany [compared to the US], far more areas are subject to bargaining, information, and consultation set out in law, with elected worker representatives on corporate boards and works councils. Their hand is strengthened by employment protection legislation and their rights to negotiate over the process of restructuring (*Interessenausgleich*) and measures to support laid-off workers (*Sozialplan*).”

The industrial relations system in Germany’s automotive industry thus appears to be well equipped to manage the EV transition in a just manner. However, as we already explained above, according to Hancké and Mathei (2024), this expectation may prove to be too optimistic. In their analysis, the EV transition is producing new cleavages within the car industry, both

between firms and between unions and (some) work councils, due to which collective interest representation, usually built around coherent intra-industry blocs, has become very difficult.

The German government has not been of much help so far. Under Germany's strict rules on running up public debt, the German government does not have the fiscal policy space to invest in the green/EV transition. According to the constitutional debt brake, the German government can borrow only in an emergency — and this is what it did in 2021 in response to the COVID-19 health crisis. However, the money eventually was not needed for that purpose, and the centre-left Scholz's three-party coalition decided in 2022 to put the money into an off-budget special purpose “climate and transformation fund,” arguing that investment in measures to protect the climate would help the economy recover from the pandemic. The government repurposed €60 billion originally meant to cushion the fallout from the corona crisis to this fund, and earmarked another €140 billion for the climate fund (including revenue from carbon emission trading). The “climate and transformation fund”, which was set up as a way to go around the constitutional debt brake, was intended to help build up the hydrogen industry (McWilliams and Zachmann 2024), improve railway infrastructure, support the transition to electric vehicles and renovate buildings.

The funds have not been used, however. In November 2023, Germany's highest court annulled the government decision to repurpose €60 billion for COVID19 measures to help combat climate change and modernize the country. In response, the government decided to cut spending on climate and transformation projects by billions of Euros.²⁷ Specifically, it abruptly ended its electric car subsidy programme that had offered a subsidy of up to 4500 euros for the purchase of a battery-electric car. At the same time, a €200-million subsidy programme that had only been announced (and not yet started), and that was intended to promote private charging points, in addition to the related electricity storage units, was also cancelled.

The German government has to come to terms with the fact that the pace of the global automotive industry is no longer set in Berlin (or Brussels) but in China and the United States.

²⁷ In September 2023, following a public and political backlash, the German government had to backtrack on its ambitions to accelerate the shift to heat pumps, solar panels and hydrogen boilers to reach a national target of carbon neutrality by 2045. The Scholz government originally planned an effective ban on all new gas and oil boilers, requiring new systems to be powered by a minimum of 65% renewable energy from January 2024. The weakened plan that was adopted by the German Bundestag, means that the country will most likely miss its 2030 carbon emissions targets for buildings.

The competition is no longer dominated by VW, BMW or Mercedes, but by Tesla from the US and BYD from China. And the newcomers are no longer confining themselves to their home markets — they are also capturing market share in Germany and Europe. All the German government has done, so far, is confusing German car buyers²⁸ — and so is the European Commission, which has begun to backtrack on the aim to phase out combustion engines by 2035. European Commission President Ursula von der Leyen, once staunchly supporting the phasing out of ICEVs engines, now considers it “very important” to review the issue in 2026 (Book *et al.* 2024).

In Germany, scrapping the EV subsidy schemes did lead to a decline in new EV registrations in 2024, fuelling fears that the government target to have at least 15 million EV on German roads by 2030 is out of reach (Agora Verkehrswende 2022). The ambiguous signals threaten the coordination of different actors’ expectations with respect to a common EV future. This has not helped the German car industry which is already lagging behind in the global EV transition and is now in an existential crisis — a crisis that is reverberating across the German economy as a whole.

1.5. The EV Transition is Make or Break for the German Economy

According to the Draghi (2024) report, ignoring Europe’s structural problems and economic decline is no longer an option, because the world has changed fundamentally: European economies have to deeply decarbonise in order to mitigate global warming; global trade protectionism is increasing; the supply of cheap energy from Russia is gone; the European economies need to pay more for their defence; and Europe’s working-age population is shrinking. Things have to change. Draghi urges the European Union to take strong and coordinated action or, alternatively, face ‘slow agony’.

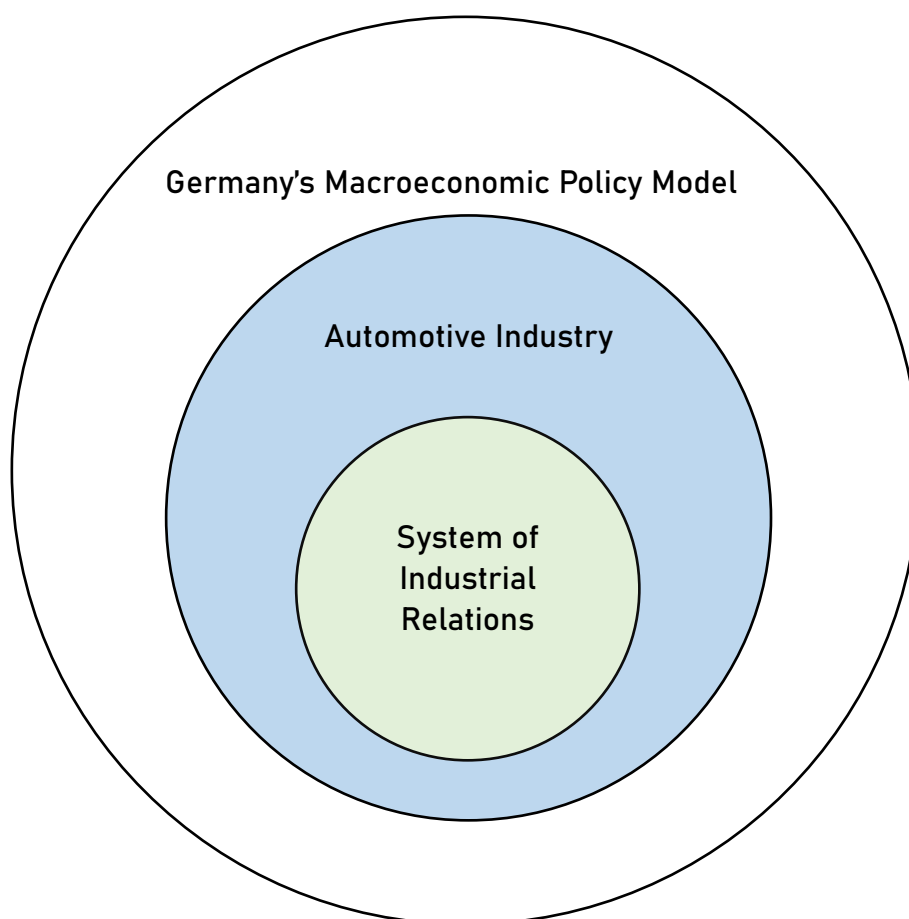
The crisis of Germany’s export-dependent economy is at the heart of the predicament of the larger Eurozone economy — and because the car industry is the ‘lifeblood’ of the German economy, much will depend on whether or not the German automotive industry will succeed in navigating the difficult EV transition. In other words, the success or failure of the EV transition

²⁸ This will only get worse. CDU/CSU leader [Friedrich Merz has repeatedly called](#) for reversing the EU’s 2035 phaseout of ICEVs. His position echoes demands from the Free Democrats (FDP) as well as the far-right Alternative for Germany (AfD).

of its car industry will determine the fate of the necessary transformation of Germany's larger economy. It is because of this that our analysis focuses on the German automotive industry, where the shift to electric vehicle production and the associated transformations of the industry, the larger economy and the workplace are raising existential questions and fears.

The structure of our analysis is illustrated by **Figure 1.4**. In **Part One** of our analysis, we present an evaluation of Germany's macroeconomic policy model. We next examine the German automotive industry and the impacts of the EV transition in this sector on workers, industrial relations and firms (in **Part Two** of our analysis, *i.e.*, in a separate working paper).

Figure 1.4
The EV Transition in Germany: Levels of Analysis



In **Section 2** of this paper, we offer an analysis of Germany's macroeconomic model that identifies the macroeconomic constraints on the EV transition in Germany's automotive

industry in the next decades. We argue that if Germany wants to avoid the ‘slow agony’ scenario outlined by Draghi (2024), its model of economic growth needs a fundamental reorientation toward creating space for adequate public funding to stimulate domestic demand and the emergence and deployment of new technologies that are needed for the EV and larger green and digital transition.

In **Part Two** of our analysis (which is forthcoming), we assess the importance of Germany’s automotive industry to the country’s macroeconomic performance. We present new (input-output model-based) estimates of the car industry’s (direct and indirect) contributions to GDP, employment, aggregate profits and exports. We discuss the car industry’s centrality to Germany’s system of innovation, its role as a provider of good, relatively well-paid jobs, and its central position in Germany’s system of concerted industrial relations. We will finally review the research on the implications of the ongoing transition from combustion engines to electromobility for value creation, employment and industrial relations in the German automotive industry from a political-economy perspective. We will analyse how the EV transition is shaped by the tradition of negotiated change in the automotive industry, that is embedded in the larger ‘German model’ of industrial relations. We examine whether or not the historical and institutional strength of Germany’s industrial relations system has been and will be working *against* the transition to EVs (as has been argued by Hancké & Mathei (2024)). In the final conclusions, we contextualise the EV transition within the larger macroeconomic context and focus on the role of the German federal government and the Bundesbank in backing the transition to EVs and funding supportive industrial and social policies.

1.6. Disclaimer: The Ecological Footprint of Electric Vehicles

Proposals for greening personal mobility range from the electrification of cars to a fundamental transformation of the existing transport system, including a drastic reduction in car ownership and use and the shift to a multimodal public-private transport system (Keil and Steinberger 2024). While a drastic reimagination of transport systems will be critical to a successful green social-economic transition, our capitalist society and economy will most likely continue to remain locked in into the car-centred transport system for political, economic and

cultural reasons (Mattioli *et al.* 2020; Kuper 2024).²⁹ Using its political clout, the automobile industry is a key actor upholding the car-dependent transport system, often with the support of industry unions which perceive a fundamental restructuring of the automotive industry as a threat to their interests and associational power (Brand and Wissen 2021). Our focus in this report is squarely on the macroeconomics and the political economy of the EV transition in Germany — and we shall have to leave aside addressing the pertinent question to what extent the shift to electric vehicles is itself ecologically sustainable. However, before proceeding, we explicitly consider the ecological sustainability of electric vehicles, which is by no means an unproblematic issue.³⁰

First, the production of (batteries for) EVs is relatively CO₂-intensive; this is mostly due to the fact that the batteries are (currently) produced in economies with a high share of coal in their energy mix. Electric cars are also responsible for more emissions than their gasoline/petrol/diesel counterparts in the recycling phase. However, in-use carbon emissions of EVs are considerably lower than those of ICEVs, but the actual difference depends on the energy sources used to generate the electricity needed for the EVs. Over the vehicle's life-cycle, the estimated distance at which ICEVs and BEVs break even in terms of CO₂ emissions ranges from 29,000 to 150,000 km, depending on the grid decarbonisation scenario (see Helms *et al.* 2019). This means that the break-even point arrives after approximately 2 to 10 years of car driving, assuming that the average mileage per vehicle is 15,000 km per year.

Second, looking beyond just carbon emissions, it must be noted that the production of EVs is relatively resource intensive, using virgin raw materials (including lithium, cobalt and nickel) and rare earth materials. About 60% of the reserves of cobalt are found in the Democratic Republic of Congo (DRC), where rainforests with rich biodiversity grow. Mining in these areas could threaten biodiversity. In general, the sourcing of each of these materials comes with considerable ecological damages in often biodiverse regions and reproduces and reinforces already existing social-economic and spatial inequalities (Riofrancos *et al.* 2023; Haghani, Ghaderi and Hensher 2024). Bilateral or multilateral trade deals with resource-rich countries have been and will be struck to enable the appropriation of critical raw materials, often at the cost of the (local and global) environment and local populations (Rushdi *et al.* 2021). The

²⁹ See Haines-Doran (2023) for a recent analysis of how new forms of personal finance provided by the car industry to car buyers are used to induce consumers to purchase larger cars and to do so more frequently.

³⁰ Our discussion in this section is based on Keil and Steinberger (2024).

automotive industry in the EU, the US and China is a chief lobbyist for such agreements — trading off the ‘greening’ of their industry against further ecological degradation and economic disenfranchisement of the Global South.

The EV transition also raises complex geopolitical problems. Rare earth materials are mainly sourced and processed in China; for example, in 2019, 94% of rare earth magnets, needed in each EV, were made in China (Gauß *et al.* 2021). The massive amount of groundwater required for battery production also means that making electric cars uses 50% more water than manufacturing traditional combustion vehicles. The car industry also does not yet have a cost-effective means to recycle lithium-ion electric car batteries which have a rather limited lifespan.³¹ In sum, the ecological footprint of EVs is very substantial — and this puts the ecological sustainability of electric automobility into serious doubt (Keil and Steinberger 2024).

Finally, the EV transition suffers from significant problems of scale — both at the level of the individual car and at the macroeconomic level. At the level of the individual car, it is remarkable that the business model of key electric car manufacturers ranging from Tesla to Mercedes to Volkswagen continues to rely on bigger, heavier and high-profit-mark-up cars with more powerful engines, rather than smaller, more energy-efficient cars (Keil and Steinberger 2024). The average electric car is heavier than the average petrol or diesel one and it is getting heavier over time (see **Figure 1.6**).³²

In the context of BEVs, the ubiquitous ‘rebound effect’ manifests when consumers, once they switch to a BEV, may purchase a bigger car than they would have done when buying a conventional ICEV, because BEVs typically have lower operating costs compared to gasoline vehicles. BEV owners may also decide to drive more than they would have done with an ICEV, because the operational costs of BEVs are lower (Haghani *et al.* 2024).

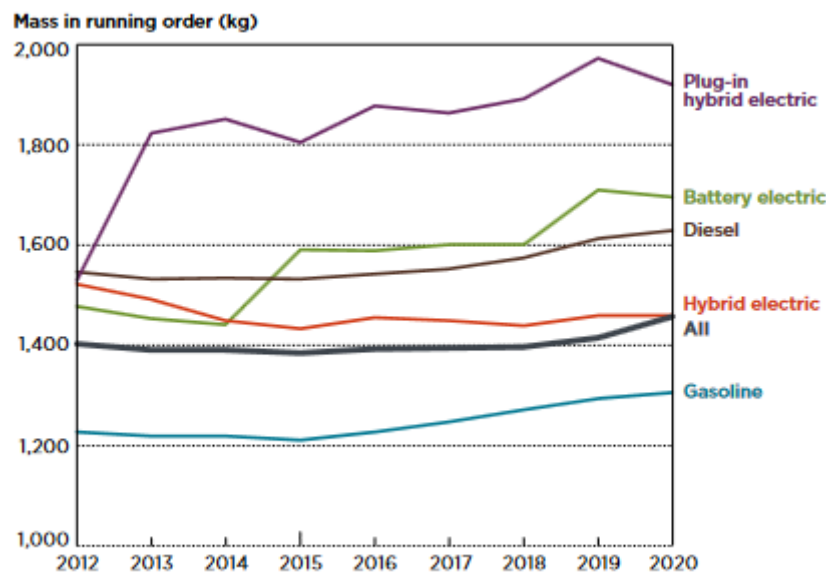
The ecological potential of BEVs runs the danger of being undermined by the continued growth in vehicle size and weight. Car producers, including the German ones, have been slow in taking

³¹ The EV battery pack typically is the most expensive component of an EV. Replacing the batteries is a costly proposition. EV batteries get degraded during usage. It should be noted here that, at present, EV producers offer an 8-10 year, or 150,000-km, warranty on the lithium-ion battery pack installed in the vehicle.

³² Electric cars may be too expensive to expose to the daily vicissitudes of city streets. The safety record of EVs so far has been mixed. The car rental agency Hertz is selling a third of its electric fleet partly because of high damage costs (Kuper 2024). Parking of EVs in the car park buildings of Delft University of Technology is not allowed, because EV fires are so extremely difficult to extinguish.

up the production of small EVs, and as a result, they have lost market share (in Asia) to Chinese producers who have been pursuing a different path with EVs, choosing to produce smaller and cheaper city cars that can compete, and even out-compete equivalent ICE vehicles.

Figure 1.6
Average Mass in Running Order of New Car Registrations
in the EU and the UK by Powertrain Type



Source: ICCT (2021/22), *European Vehicle Market Statistics 2021/22*.

At the macro level, going to scale means not only manufacturing millions of EVs per year but supporting them from recharging to repair. The charging infrastructure needs to be built and the electricity grid needs to be decarbonised at unprecedented pace. The transition will require significant investment in the broader electrical grid, including cable networks necessary to support increased demand. Transforming the energy and transportation sectors simultaneously involves a large number of known and unknown variables, which will interact in complex, unpredictable ways. Each proposed solution will create new difficulties, and technological solutions alone do not mean anything without supportive social and economic changes, including changes in lifestyles; for one, EV repair costs tend to be high and not affordable for large sections of the population.

Transforming the 120-year-old business model of the auto industry that is optimized for ICEV production to EVs using emerging technology is a monumental challenge in itself. Requiring that automakers do so in fifteen years or less is even more daunting. Global supply chains have to be reinvented, new (software) platforms have to be developed, and employees will have to develop new mechatronic skill sets. Many things need to go exactly right, and very little can go wrong for the EV transition to transpire as planned.

In terms of resources, the production of EVs and the decarbonisation of electricity generation will lead to very large increases in demand for certain base metals, including cobalt and lithium, which, aggravated by the absence of cost-effective recycling schemes, will put enormous pressures on the supply chains of these metals and critical materials, which in turn could seriously constrain the widespread deployment of EVs ([Jones, Elliott and Nguyen-Tien 2020](#)). If recycling does not ramp up, the demand for [lithium](#), [nickel](#), or [cobalt](#) would exceed what is economically accessible to extract. This dwindling of reserves would likely raise material costs, triggering increased exploration and development, and potentially expand reserves ([IEA 2022](#)). All this means that the EV transition *at scale* is going to be bumpy and destructive, and perhaps even infeasible. And even if it leads to lower carbon emissions overall, it will strengthen unsustainable economic activities across the globe that undermine the very basis of life.

The EV transition may, therefore, not constitute the radical transformation of the transportation system that the world needs to green personal mobility in a sustainable manner. However, right now, it does constitute one of the few avenues for reform that have political support and momentum. It is by all means a transition that is actually happening, as is evidenced by the rapid growth of EV sales in China. Our paper focuses on the macroeconomic context and the industry-level political economy of the German EV transition, but we advise readers to consult Riofrancos *et al.* (2023), Haghani *et al.* (2024) and Keil and Steinberger (2024) on the larger concerns regarding the sustainability of EV technology.

“In der Beschränkung zeigt sich erst der Meister”
— Johann Wolfgang von Goethe

“Denk ich an Deutschland in der Nacht,
dann bin ich um den Schlaf gebracht,
Ich kann nicht mehr die Augen schließen,
und meine heißen Tränen fließen.”
— Heinrich Heine

2. GERMANY'S MODEL OF ECONOMIC GROWTH

The German economy is facing three fundamental challenges to its current model of growth. First, German growth, which is strongly dependent on exports, is faltering, because today, with rising protectionism — not only in China but especially in the US — world trade is no longer an engine of growth (Draghi 2024). In other words, Germany can rely no more on other countries stimulating its economy. Second, the German economy, which has benefited from its strong industrial base for decades, is now facing high energy prices and the urgent need to decarbonise. German firms can no longer procrastinate and delay investing in the green transition. Third, within German manufacturing, the automotive sector, the key industry, finds itself in an existential crisis. German car makers have become overly dependent on the Chinese market (Puls 2024; Tordoir and Setser 2025). They have also been complacent, relying for too long on the production of combustion engines, while not investing enough in fuel cell technology and digital services and platforms. Germany used to supply advanced technologies to China; today, Chinese battery companies are exporting (relatively cheap) electric vehicles and advanced technologies to Germany (and by investing in Germany).

To successfully address these challenges, Germany's model of economic growth needs a fundamental transformation and comprehensive reorientation. This endeavour depends on support from macroeconomic policies which provide public funding to stimulate domestic demand, public (digital) infrastructure and the emergence and deployment of new technologies (as also argued by Bofinger (2023) and Tordoir and Setser (2025)).

In what follows, we offer an analysis of Germany's economic model that is intended to identify the (macroeconomic) constraints on the EV transition in Germany's automotive industry in the next decade. In our view, most extant studies of the evolution of Germany's post-WWII 'variant of capitalism' do not give sufficient weight to the roles played by monetary policy and fiscal

policy in shaping corporate decision-making, the industrial relations system and Germany's idiosyncratic 'financial-industrial' complex.

We give centre-stage to the Bundesbank's tight monetary policy during 1950-1980, which led to a strong and expensive currency that helped turn German firms into high-price exporters, competing on non-price factors. The relentless prioritisation of price stability, supported by wider institutional factors, enabled German banks to offer patient capital for strategic investment and R&D by Germany's exporting oligopolistic firms. Fiscal policy had to be conservative, supporting price stability, while the system of coordinated industrial relations and pattern bargaining ensured stable and widely shared income growth, which contributed to relatively strong and broad-based domestic demand growth.

This model worked remarkably well during the period 1950-1980, but broke down when the world changed during the 1980s and 1990s — following the oil crisis and the stagflation of the 1970s, German reunification, European monetary integration, financial globalisation and the rise of China Inc. The old model transformed into a non-model, or a pathology: with economic growth in long-run decline, Germany's exporting companies have been doing extremely well and have been earning massive profits generated by activities abroad; yet, Germany's public infrastructure is crumbling after decades of public underinvestment and 'black zero' fiscal conservatism, the unemployment rate is low mainly because large sections of the working-age population have to work in atypical employment (often in part-time or mini-jobs), the coordinated industrial relations system has been weakened, aggregate wage growth is actively suppressed below labour productivity growth to protect the corporate profit share, earnings and income inequality has been rising, and all the while, business investment in the domestic economy is depressed, while FDI exceeds net domestic fixed investment. This way, Germany's firms remained competitive, but German workers were left behind. Germany has been turned into a 'stagnation-nation'.

In what follows, we review the role of exports in Germany's economic growth (**Section 2.1**), assess the political-economy literature on Germany's growth model (**Section 2.2**), discuss the role of the Bundesbank and the financial-industrial complex in Germany's *Wirtschaftswunder* (**Section 2.3**), evaluate why and how this growth model broke down in the 1980s and 1990s (**Section 2.4**) and explain why Germany's policy framework reached the end of the road already more than two decades ago (**Section 2.5**).

In a nutshell, our argument is that the German economy is sick and has been sick for a long while. Absent a drastic reorientation of German fiscal and monetary policy, the necessary (green and digital) transformation of the German economy will likely fail. The German automotive industry is the proverbial canary in the coalmine, an advanced warning of a looming failure (Münchau 2024). The success or failure of the EV transition of the car industry will determine the fate of the transformation of Germany's larger economy (Tordoir and Setser 2025).³³

2.1. The Role of Exports in Germany's Economic Growth

The extant (political economy) literature on Germany's growth model is too large to review here (but see Halevi 1995; Hall and Soskice 2001; Storm and Naastepad 2015; Baccaro and Benassi 2017; Scharpf 2018). As a starting point for our discussion, let us note that Germany has always been an export-oriented economy: exports as a percentage of (West) Germany's GDP rose from 12% in the early 1960s to 25% in 1990, and then doubled to around 50% in 2022-23 (Figure 2.1).

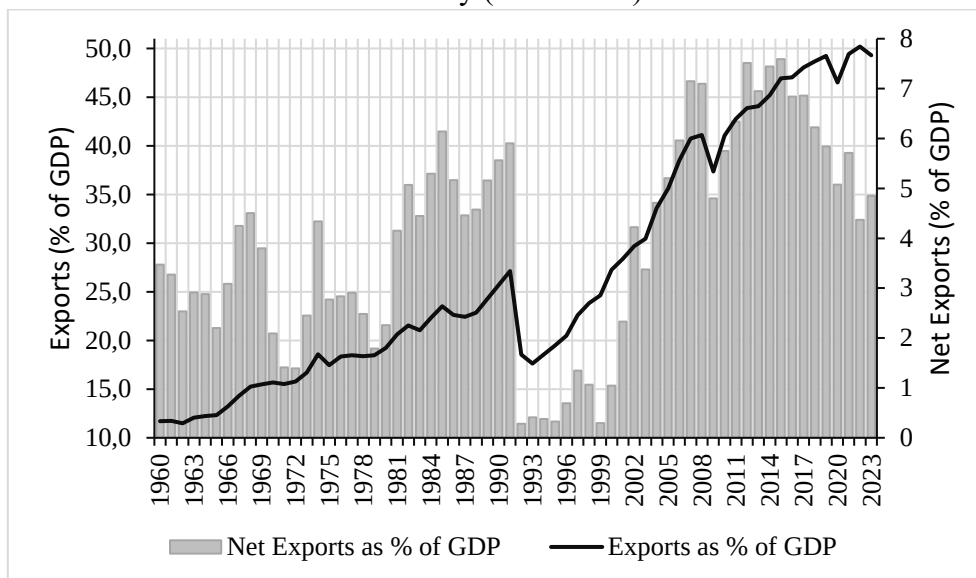
Germany's exports increased by 6.2% per year during 1961-1991, by 6.6% per annum during 1992-2008 and by a (rather meagre) 2.2% per year during 2008-2023 (Figure 2.2). In fact, average annual export growth was 4.3% during 1991-2023, lower than the average annual export growth achieved during 1961-1991.

As told by Lindlar and Holtfrerich (1996), Germany's export 'boom' started already in 1949 and lasted for decades (until the mid-1970s). In the early 1960s, German exports accounted for more than 11% of world exports, while Germany's share in global GDP was less than 7%. More than one-third of intra-West-European exports originated in Germany. During the 1960s and 1970s, two-thirds of Germany's exports were sold to Western European economies and another 10% to North-America.³⁴

³³ The liberal response is to give up on the automotive industry, and develop new – more future-proof – industries. See The Economist (2023) and Münchau (2024).

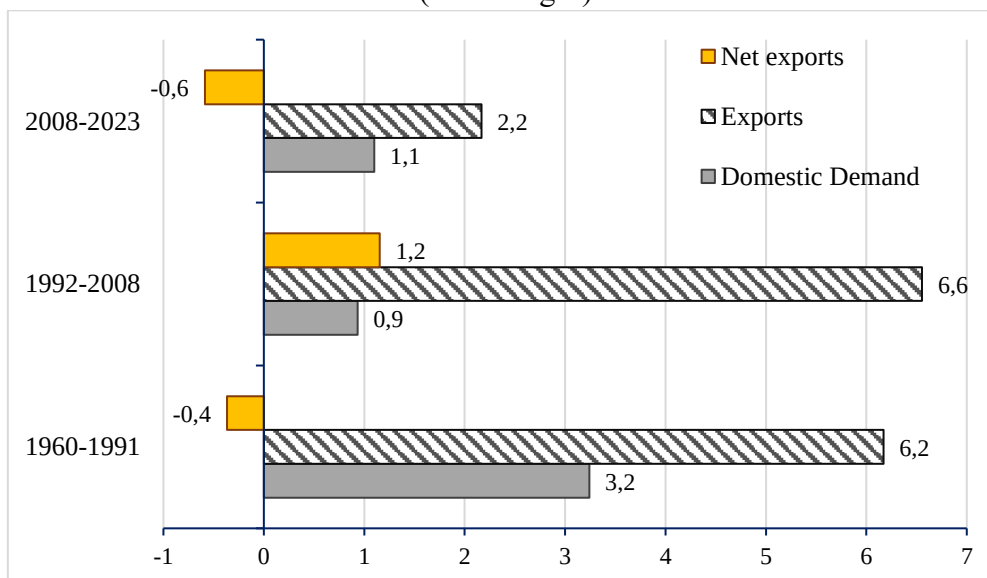
³⁴ Calculated by Storm and Schröder, based on data from OECD *Economic Surveys: Germany* (various issues).

Figure 2.1
Exports and Net Exports as a Percent of GDP,
Germany (1960-2023)



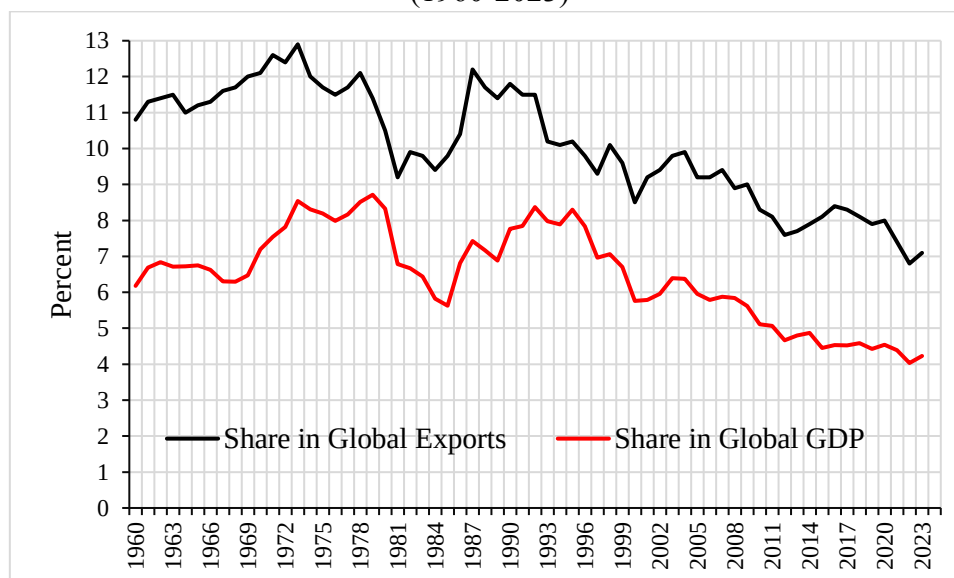
Source: AMECO database. There is a break in the data in 1991. The data for 1961-1991 are for West Germany; the data for 1992-2023 are for unified Germany.

Figure 2.2
Average Annual Growth Rates of Domestic Demand, Exports and Net Exports,
Germany (1960-2023)
(Percentages)



Source: AMECO database. There is a break in the data in 1991. The data for 1961-1991 are for West Germany; the data for 1992-2023 are for unified Germany. The GDP deflator was used to deflate the nominal values of these variables.

Figure 2.3
Germany's Shares in Global Exports and in Global GDP
(1960-2023)



Source: AMECO database and World Bank Development Indicators. There is a break in the data in 1991. The data for 1961-1991 are for West Germany; the data for 1992-2023 are for unified Germany. Variables are expressed in current US dollars.

From the onset of the postwar boom, Germany was highly specialized in the production of machinery, transport equipment (cars) and chemicals³⁵, with most German firms operating in oligopolistic markets and having price-setting power. Germany's export orientation is not surprising in light of this specialisation in (medium- and high-tech) manufacturing activities that (generally) exhibit increasing returns to scale. As a result, for most, often highly specialised, industrial firms, the German domestic market is simply too small to allow for profitable production. Take the example of passenger cars: at the end of the 1950s, already around 50% of German car production was exported; Germany's car exports as a proportion of domestic car production rose to 75% in the 2020s (**Figure 2.4**). Germany's export orientation is, therefore, hardwired into its economic structure.

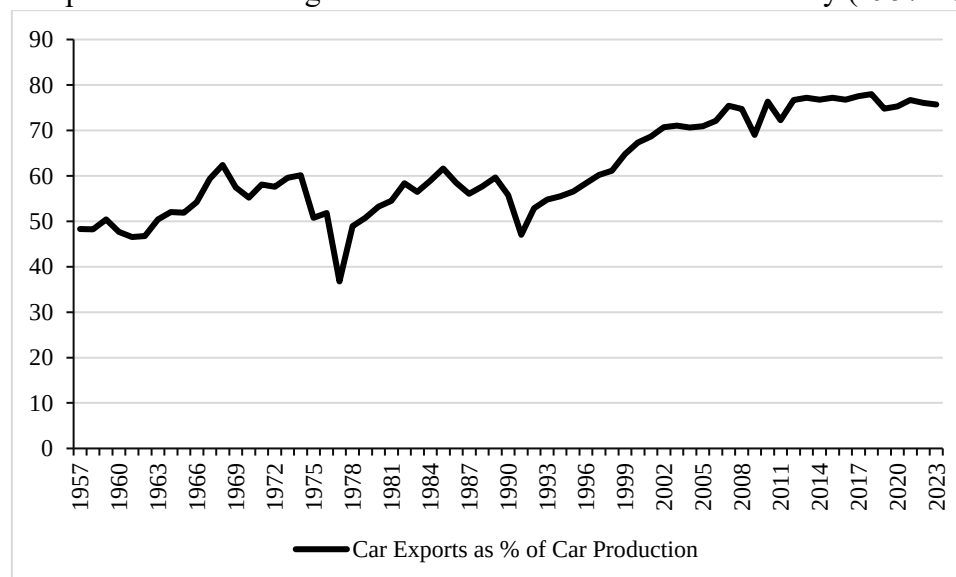
Germany's imports have also increased over time as the economy globalised: from circa 9% of GDP in the early 1960s to 21% of GDP in 1991 and further to 45% of GDP in 2022-23.

³⁵ In 1953, these industries contributed about 40% of Germany's total exports (Lindlar and Holtfrerich 1996).

Germany's exports are relatively import-intensive, which means that higher export growth leads to higher import growth.³⁶ Rapid import growth was driven by the outsourcing by German firms, during the 1990s and 2000s, of lower value-added production segments to post-socialist central European countries to compress wage and energy costs, in response to the growing competitive pressure of the East Asian industry (Stehrer and Stöllinger 2015; Celi *et al.* 2018).

German *net* exports amounted to 3.6% of GDP on average per year during 1960-1991 and 4.1% on average per year during 1992-2023 (Figure 5). Hence, while it is true that exports were the single most important driver of economic growth in Germany during 1992-2008 (Table 2.1; Baccaro and Höpner 2022), *net* export growth contributed only 0.22 percentage points to the country's annual rate of economic growth during 1992-2023, which is similar to its contribution of 0.2 percentage points to West Germany's yearly rate of economic growth during 1961-1991 (Table 2.1).

Figure 2.4
Car Exports as a Percentage of Domestic Car Production: Germany (1957-2023)



Source: German Association of the Automotive Industry (VDA), database.

³⁶ The import intensity of aggregate German exports has been estimated to be 28.5% in 1996 and 42.2% in 2006 (Brautzsch and Ludwig 2014).

Table 2.1

Decomposition of Real GDP Growth: Germany (1961-2023)

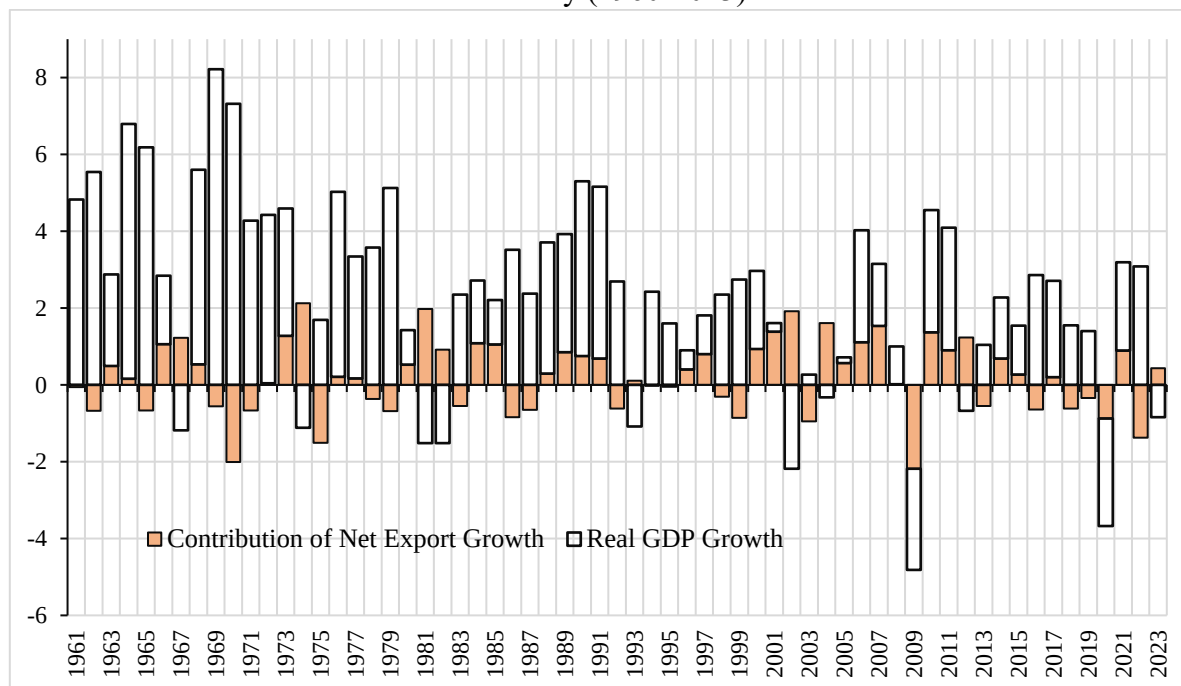
	Contribution to annual real GDP growth of:						Real GDP growth
	Private consumption	Public consumption	Gross capital formation	Exports	Minus Imports	Net exports	
1961-1991	1.96	0.60	0.68	1.14	-0.94	0.20	3.44
1992-2023	0.52	0.36	0.22	1.52	-1.30	0.22	1.31
Change	-1.44	-0.24	-0.46	0.38	-0.36	0.02	-2.13

Source: AMECO database. The data for 1961-1991 are for West Germany; the data for 1992-2023 are for unified Germany.

Figure 2.5 presents the contribution of *net* export growth to Germany's annual real GDP growth during 1961-2023. The contribution of net export growth to real GDP growth fluctuates over the years, was positive in 19 out of 30 years during 1960-1990, and does not exhibit a significant rising trend over time. In fact, Germany's export performance has worsened during the period 2008-2023 (as already noted above): the average annual rate of export growth was only 2.2%, which is not exactly spectacular (Figure 2.2).

In fact, export growth became more critical to Germany's macroeconomic performance in recent decades, only because of the secular stagnation of domestic demand — and particularly private consumption. During 1961-1991, private consumption growth contributed almost 2 percentage points to West Germany's average annual economic growth rate of 3.4%. However, during 1992-2023, private consumer spending added only 0.5 percentage points to the (much lower) average annual growth rate of 1.3% of the German economy (Table 2.1). When we include government current spending and gross capital formation, we find that domestic demand growth contributed 3.3 percentage points to West Germany's real GDP growth during 1961-1991, but a mere 1.1 percentage points to Germany's economic growth after reunification.

Figure 2.5
Contribution of Net Export Growth to Real GDP Growth,
Germany (1960-2023)



Source: AMECO database. *Note:* There is a break in the data in 1991. The data for 1961-1990 are for West Germany; the data for 1991-2023 are for reunified Germany.

The defining feature of Germany's economic performance during the reunification period 1991-2023 is, therefore, not its growing reliance on export growth, but rather the secular slump of domestic demand (Table 2.1) and the consequent slowdown in economic growth.³⁷ As Figure 2.6 shows, Germany's annual economic growth rate declined from around 4% in the 1960s and 1970s, to circa 2% in the 1980s to just 1% during 2012-2023. Germany's potential growth declined in tandem: from 3.3% per year on average during 1966-1979, to 2.3% per year in the 1980s and further to 1.2% per year during 2012-2023 (Figure 2.6).

The slowdown in economic growth created a long-term unemployment crisis in Germany that lasted from the mid-1980s until 2008. German reunification intensified this unemployment crisis, as East Germany experienced one of the worst depressions in modern economic history and joblessness there increased from virtually zero to more than 30 per cent of the work force

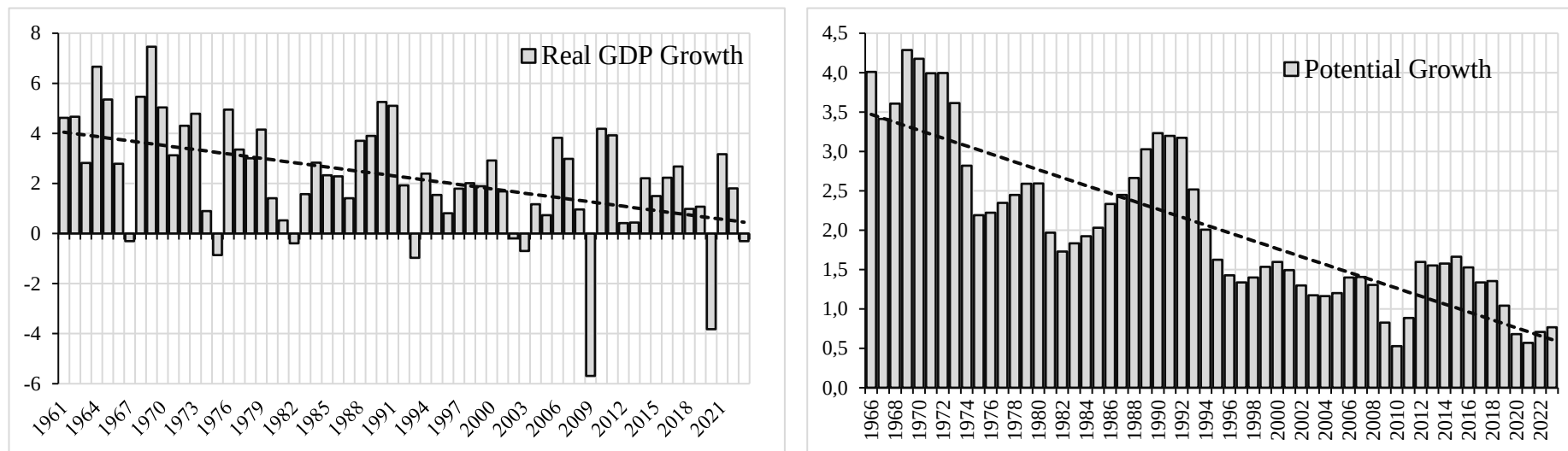
³⁷ During these years, German firms stepped up foreign direct investment. In fact, the expansion of the EU after the Fall of the Wall created a post-Nafta Mexican opportunity for German capital; the labour forces in Eastern Europe were even highly educated.

during 1991-1993; the unification shock to the East added at least 2.5 percentage points to Germany's overall unemployment rate (Lindlar and Scheremet 1998). While the average annual rate of unemployment in (West) Germany during 1960-1980 was 1.8% and 5.8% during the 1980s, the unemployment rate in unified Germany averaged 7.4% during the 1990s and 8.6% during 2000-2008. Germany's unemployment rate peaked at 10.5% of the labour force in 2005. Hence, right when Germany's export industries were booming, with exports growing at an annual rate of 6.6% during 1992-2008 (**Figure 4**), one in ten German workers found herself without a job. It is hard to see this as a successful model of export-led growth.

However, following the Hartz labour market reforms, Germany's unemployment rate came down to 6.8% on average during 2006-12 and 3.8% on average during 2013-23 (**Figure 2.7**). We note here that a part of the decline in the unemployment rate had nothing to do with the Hartz reforms, because it was caused by the decline in Germany's working-age population: as baby boomers began to retire (or were encouraged to retire early), the country's working-age population declined by 0.8% during 2008-2023, notwithstanding the large inflow of working-age migrants during this period. Demographically, Germany is still an exception: working-age populations in France, the U.K. and the US rose by 0.1%, 4.7% and 4.7% during 2008-2023, respectively. Due to ageing, Germany's working-age population is projected to decline rapidly during the next decade — at a much faster rate than the labour forces in the afore-mentioned countries (Fletcher *et al.* 2024).

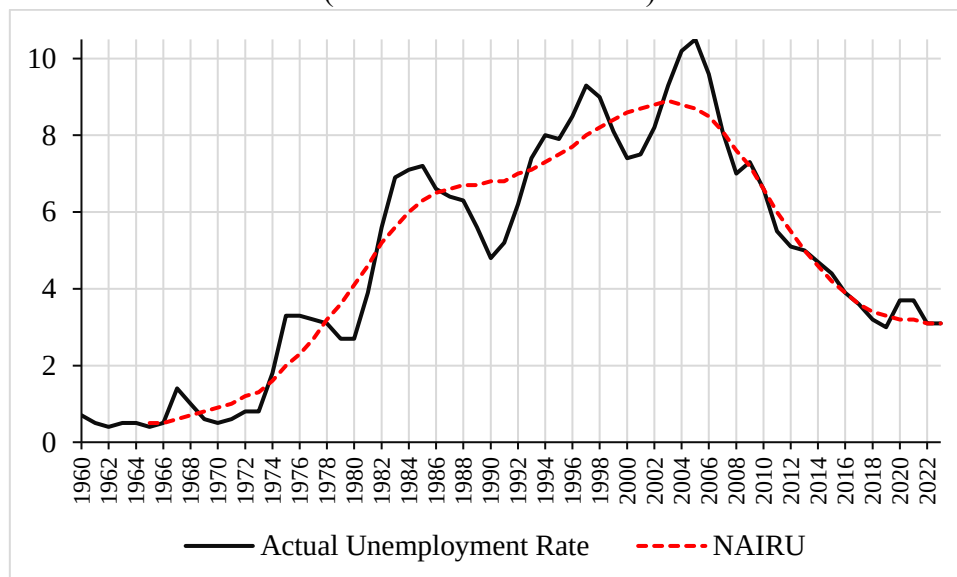
Germany's unemployment rate also fell because of the secular decline in Germany's aggregate rate of labour productivity growth (**Figure 2.8**). Germany's labour productivity increased by circa 3.6% per year on average during the 1960s and 1970s and by 1% during the 1980s. German reunification in 1991 led to a further drop in productivity growth to 0.5% per annum during the first half of the 1990s. But then productivity growth recovered to more than 1% per year during 2004-2006. However, following the Harz reforms, Germany's labour productivity growth declined to just 0.3% per year during 2009-2023, as many workers found employment in low-wage, low-productivity services jobs, which were also often part-time and temporary (Storm and Naastepad 2015). Germany thus solved its structural unemployment problem not by higher growth or higher exports, but rather by creating relatively low-paid jobs in non-traded sectors in an otherwise stagnating economy (see **Section 2.4**), and outside its core manufacturing sector, by actively and drastically liberalising the labour market outside manufacturing (Carlin and Soskice 2009). The big labour unions supported this 'solution'.

Figure 2.6
Germany: Annual Real GDP Growth and Annual Potential Growth: 1961/66-2023
(Percent)



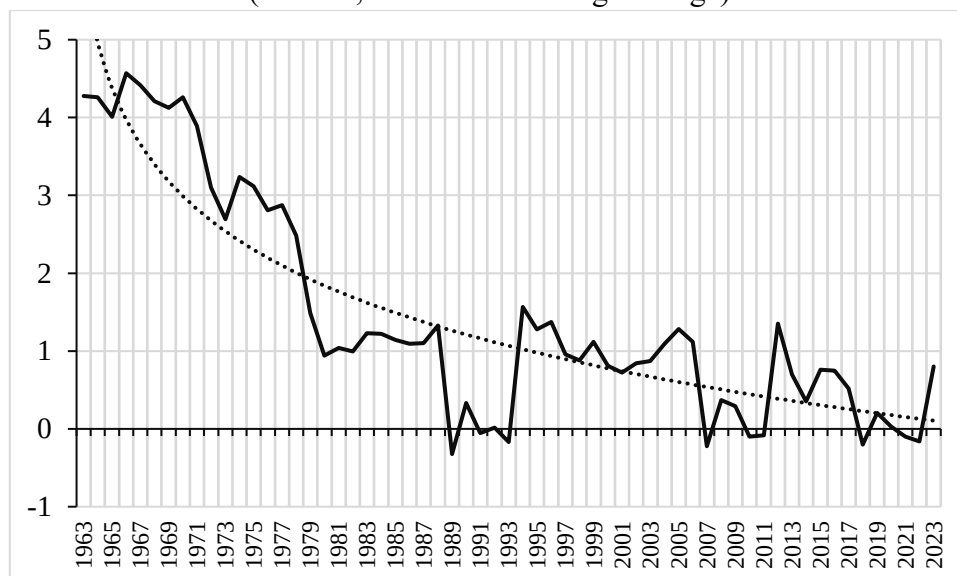
Source: Authors' calculations based on AMECO data. Note: The dashed curves indicate the (negative) time trends.

Figure 2.7
The Actual Unemployment Rate and the NAIRU: Germany (1960-2023)
(Percent of Labour Force)



Source: AMECO database. *Note:* There is a break in the data in 1991. The data for 1960-1991 are for West Germany; the data for 1991-2023 are for unified Germany.

Figure 2.8
Labour Productivity Growth: Germany (1960-2023)
(Percent; Five-Year Moving Average)



Source: AMECO database. *Notes:* Labour productivity is defined as real GDP per employed person. The dashed curve is the fitted (logarithmic) time trend. Labour productivity growth has been calculated as a five-year moving average. There is a break in the data in 1991.

2.2. Germany: From Balanced to Unbalanced Growth?

Most of the comparative political economy (CPE) literature explains the slowdown in Germany's economic growth by foregrounding the argument that Germany's growth model did become export-led after 1990.³⁸ The CPE narrative goes — broadly — as follows (Baccaro and Benassi 2017; Scharpf 2018; Baccaro and Höpner 2022). Due to (financial) globalisation, the rise to global hegemony of the ideology of shareholder value maximisation, and radical geopolitical change (*i.e.*, the opening up of the former socialist economies of Eastern Europe and German reunification), the balance of power between organised labour and employer associations in Germany, as elsewhere in the world, changed in favour of the latter during the early 1990s. In effect, employers began to actively liberalise, if not undermine, Germany's coordinated industrial relations system, as labour rapidly lost its ability to pose a credible threat.

As a result, it is argued that beginning in the 1990s, Germany transitioned from 'balanced' growth — with domestic consumption and investment and net exports contributing to demand growth (see **Table 2.1**) — to an overwhelmingly export-led growth model that has been underpinned by a strong unit-labour cost competitiveness (Baccaro and Pontusson 2016). The strong unit-labour cost competitiveness was achieved by active and coordinated wage growth suppression (relative to labour productivity growth), especially following the Maastricht Treaty of 1992 and the introduction of the common currency in 2001 — a process that culminated in the wide-ranging Hartz I-IV reforms of the German labour market of 2003-2005 — and the outsourcing of production to Eastern Europe (Hassel 2014; Baccaro and Benassi 2017; Scharpf 2018). The power of unions weakened, because Germany's export-oriented firms outsourced and off-shored production and withdrew from sectoral collective bargaining, and as a result, wage growth stagnated, both overall and specifically in the lower half of the wage distribution. German employers used (the threat of) relocation³⁹ to increase the willingness of works councils and unions to engage in concessions and increasingly rely on staff agencies and subcontractors, as atypical work became more and more common, also in Germany's manufacturing core

³⁸ In our view, German economic growth became export-dependent, as a pathology, because of the weakness of domestic demand. This is not the same as framing the German economy as a purposeful export-led growth model.

³⁹ The opening up of Eastern Europe and its inclusion into the EU strengthened the position of capital in similar ways as happened in the US following Nafta. Rosa Luxemburg would not have been surprised by the eastward drive of German manufacturing: to her, by integrating new territories and economies, German firms could realise higher profits as well as grow their markets.

(Sobota *et al.* 2024). The stagnation of wages, in turn, weakened the ability of household consumption to act as growth engine, reinforcing the systemic importance of exports and the ‘unbalanced’ nature of the emerging growth model.

The CPE narrative, while rightly pointing out major changes in Germany’s industrial relations system, is not convincing, however. First, while emphasizing the growing contribution of export growth to Germany’s overall economic growth, it remains silent on the fact that Germany’s imports rose in step with its exports — not least because of the rising import content of German exports (see **Table 2.2**). For every euro of German exports, the country’s imports rise by around 40 eurocents. And, as is shown in **Table 2.1**, the contribution of *net* export growth to real GDP growth did not increase during 1992-2023 compared to the earlier period 1961-1991.

Table 2.2
Import Content of Exports: Germany (Percent)

	1996	2006	2016	2021
Import content of exports	28.5	42.2	39.3	41.7
<i>of which:</i> Intermediate goods	17.7	26.0		
Re-exports	10.8	16.2		

Sources: Brautzsch and Ludwig (2014) for 1996 and 2006; Destatis for 2016 and 2021. *Notes:* The import content of exports is defined as the value of imported intermediate goods and services subsequently embodied in exports. The estimates for 1996 and 2006 on the one hand and 2016 and 2021 on the other hand are not directly comparable, because of differences in estimation methodology.

Second, the CPE narrative hinges on the assumption that Germany’s exports are relatively sensitive to (relative) unit labour costs and (relative) prices. Because of the unit-labour-cost sensitivity of exports, the economy ‘needs’ a competitive real effective exchange rate to grow exports and real GDP, and this puts constant pressure on the wage bargaining system to keep wage growth in check, and even to produce slower wage growth than trade competitors (controlling for productivity), in order to boost cost competitiveness, especially in the single currency regime (Baccaro and Benassi 2017).

A first problem with this argument concerns the real effective exchange rate (REER) which can be defined in terms of either relative export unit values or relative unit labour cost. For Germany, the two measurements do not align (**Figure 2.9**). Consider the period 1968-1974, during which Germany’s REER based on export unit values appreciated by 33%, while relative

unit labour costs rose by only 7%; it is also noteworthy that Germany's share in world exports rose by 3% during this period, despite the sharp rise in its REER. Likewise, following German reunification, the REER based on export unit values appreciated by 25% during 1991-1995, whereas relative unit labour costs rose by only 5%. And during 2013-2023, Germany's REER based on relative export unit values rose by 10% compared to a meagre 2% increase in relative unit labour cost. An exclusive focus on relative unit labour costs misses the biggest part of real exchange rate action (Halevi 2019). Germany's share in global exports declined by 25% during 1995-2012, despite the fact that its REER based on unit export values depreciated by 24% and relative unit labour cost fell by 4% during the same period. Lindlar and Holtfrerich (1996) doubt that changes in either REER or relative unit labour costs did have a strong impact on Germany's export performance during 1950-1990. Lindlar and Holtfrerich (1996, p. 20) explain why this is the case:

“.... Germany is generally more specialized in high-quality goods than most other industrial countries regardless of whether those goods are classified as high-tech (optical and precision instruments), medium-tech (machinery) or low-tech (clothing). For example, Germany's major export items have in nearly all product categories higher export unit values than other [European Community] countries. Germany's major export items are, therefore, among the most expensive in the respective product category. Since Germany is doing well in exporting those goods, they must have a higher quality. This is confirmed by the frequently made observation that many of Germany's major export industries produce tailor-made products for sophisticated customers who also expect extensive after-sales service. A higher product quality requires more input of human capital and R&D. This is confirmed by the fact that Germany's wages in industry are generally higher than in most other countries and that major medium-tech industries like chemicals and machinery invest relatively more in R&D in Germany than in other industrial countries.”

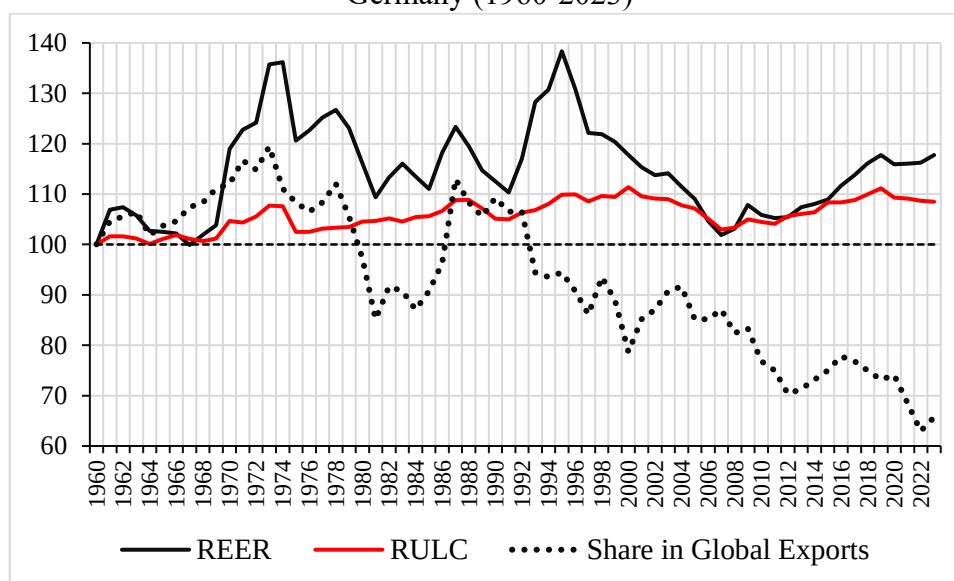
The same holds true for the years 1991-2023: Germany remains specialised in high quality, relatively expensive goods.⁴⁰

Steinherr and Morel (1979) provide a relevant explanation of the ability of German industry to expand exports in the wake of substantial appreciations of the Deutschmark. The authors assume exporting firms to be price-setters operating with a given mark-up. In this way, exporters such as Mercedes Benz, Siemens or Bosch would not be compelled to bear the full

⁴⁰ Based on Rauch's (1999) classification of traded products into differentiated and homogenous goods, we find that the share of differentiated goods in German exports is roughly 80% during 1995-2022. This is consistent with the thesis that Germany specializes in products where companies have price-setting power and high markups.

brunt of a revaluation of the Deutschmark (DM) because of the lower prices of imported inputs. By contrast, competitive producers, by being price-takers, would bear the full brunt of a revaluation of the DM, thereby witnessing a decline in the profitability of their own operations. Consequently, resources will be shifted to the oligopolistic, export-oriented sectors.

Figure 2.9
Price Competitiveness and Export Performance:
Germany (1960-2023)

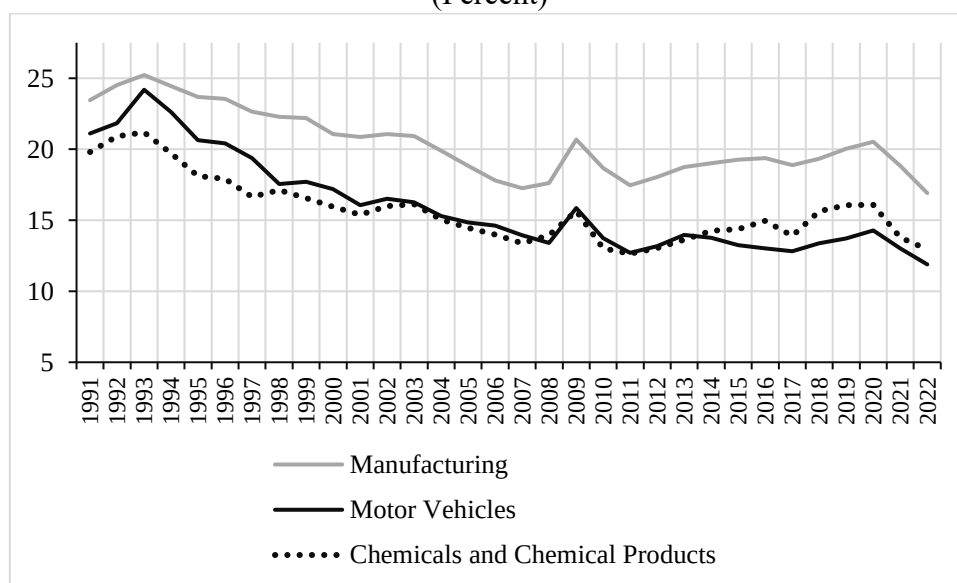


Source: AMECO database. *Notes:* The real effective exchange rate (REER) is based on export unit values, defined relative to a competitor group, with double export weights. Real relative unit labour costs (RULC) are also defined relative to competitor group, with double export weights.

Contrary to the claim made by the CPE literature, a large body of empirical evidence shows that Germany's exports (of mostly technologically sophisticated goods) are relatively insensitive to unit labour costs (Carlin, Glyn and van Reenen 2001; Storm and Naastepad 2015; Vermeiren 2017; Celi *et al.* 2018; Gräbner *et al.* 2020; Herrero and Rial 2022). A recent econometric analysis by Herrero and Rial (2023) finds that the effect of unit labour costs on relative prices and German export growth was negligible during 2001-2014. Fana and Vilani (2022) find that lower unit labour costs have not been a key determinant of the German success in the automotive industry. The superior performance of German car producers seems to be determined mostly by non-cost factors (including technological advances), in line with arguments made by Celi *et al.* (2018) and Bosch and Lehndorff (2019).

The fact that unit labour costs do not significantly affect export prices is not surprising in view of the fact that labour costs make up only around one-fifth of total production costs in German manufacturing; in the German automotive industry, labour costs account for just 15% of unit production costs (Figure 2.10). This would mean that the direct impact of an increase in unit labour cost by 1% would be to raise unit production cost in the German car industry by only 0.15% (keeping all other factors constant and assuming a full pass-through of the unit-labour-cost increase).

Figure 2.10
Unit Labour Costs in Selected Industries: Germany (1991-2022)
(Percent)



Source: Destatis database.

Of course, if unit labour costs increase across all industries at the same time, the impact on prices and inflation will be larger. However, considering such an economy-wide increase in unit labour costs, research by the **Deutsche Bundesbank** (2019) finds modestly higher impacts, which still confirm our conclusion. Specifically, based on an analysis with its macro-econometric model, Bundesbank (2019) finds that a *permanent* increase in unit labour costs by 1% (compared to the baseline) raises the CPI by 0.1% in the first year and by 0.3% after four years. However, a time-series analysis shows that the impact of an increase in unit labour costs by 1% is probably smaller, as it is found to increase the CPI by less than 0.2% after four years (Bundesbank 2019).

The bottom line is that German firms do not, generally, compete on costs. Rather, thanks to the ‘enabling constraints’ (Streeck 1997) imposed by Germany’s monetary and fiscal policies and

by the country's coordinated industrial relations system in which they operate, German firms were forced to reorient their production strategies towards market niches where quality and customization were crucial for manufacturing success. The biggest omission in the CPE narrative concerns giving not enough weight to Germany's monetary and fiscal policies, committed to low inflation, that prioritise price stability and a strong currency (but see: Halevi 1995; Carlin and Soskice 2009; Storm and Naastepad 2015).

2.3. The Bundesbank and Germany's Financial-Industrial Complex

For a proper understanding of the role of monetary and fiscal policies in Germany's growth model, we have to understand the historical and institutional origins of the German financial-industrial complex (Halevi 1995). In Germany, industrial oligopolists and 'house' banks have been institutionally tied together ever since Germany's 19th-century industrialisation under Bismarck, when it was a late-comer economy, trying to catch up with the technological leader (Britain), and its industrial projects needed large start-up capital. This capital was provided by Germany's banks. Alexander Gerschenkron (1962) did not exaggerate when he argued that banks, particularly the long-term financing universal ones, were as important to German industrialisation as the steam engine was to British industrialisation.

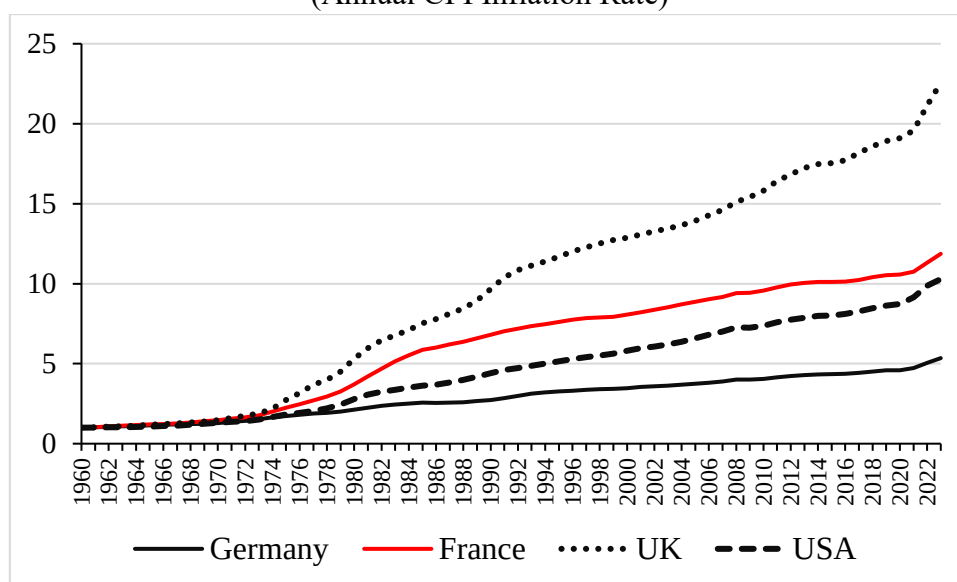
During the post-WWII reconstruction period and the 1960s and 1970s, German banks served as one-stop shops for the financing needs of firms, acting both as lenders and as anchor investors, as well as underwriters of securities (Braun and Deeg 2019). The close institutional links between the banking system and industrial enterprises implied that the latter tended to use bank credit, in addition to retained earnings, rather than going public via the stock exchange. In turn, banks took a keen interest in the objectives pursued by firms. Their power over industrial firms was consistent with — indeed complementary to — Germany's manufacturing-focused growth model, because banks provided the patient capital that allowed firms to pursue long-term strategies and engage in incremental innovation, in conjunction with labour market and vocational training institutions, among others (Vitols 2001).

The foundation of this nexus between Germany's industrial firms and banks is a near universal aversion against inflation (Halevi 1995). After all, German banks borrowed funds on a short- to medium-term basis and supplied long-term (patient) financing to German firms. Inflationary conditions would tend to shorten the term structure of borrowed funds (on the liabilities' side

of banks' balance sheets), thereby forcing banks to shift to considerably more conservative lending policies (on the asset side of their balance sheets). This would have meant the end of the provision of 'patient' capital that is generally considered to have been essential to the long-term strategies of German oligopolists. The stability of the German financial-industrial complex, to use Halevi's (1995) term, thus depends on price stability — and this is where the Bundesbank takes the centre stage.

It is important to understand that the Bundesbank's perennial preoccupation with price stability is rooted in the particular nature of Germany's financial-industrial complex (Halevi 1995). Specifically, the Bundesbank's restrictive monetary policy was meant to allow German banks to modify their liability structure from short- to longer-term denominations. In other words, the restrictive monetary policy of the Bundesbank was the foundation of the patient capital, supplied by Germany's banks. Patient capital, thus provided, freed the (large) industrial oligopolists from short-run liquidity problems and monetary fluctuations and allowed them to focus on long-term strategies. This nexus between banks and industry worked remarkably well during the growth years following post-war reconstruction up to the 1970s, and even during the 1980s, which are characterized by persistent unemployment (Figure 2.7).

Figure 2.11
Germany's Consumer Price Inflation in International Perspective (1960-2023)
(Annual CPI Inflation Rate)



Source: AMECO database.

The Bundesbank's inflation intolerance is put into stark relief by comparing the evolution of the German consumer price index (CPI) during 1960-2023 to consumer price inflation in France, the U.K. and the US (in **Figure 2.11**). The CPI of Germany rose from 1 in 1960 to 5.35 in 2023, which means that the average rate of CPI inflation in Germany during this period was 2.7% per year. The CPI of France, in contrast, rose from 1 in 1960 to 11.9 in 2023, which implies an annual inflation rate of 4.4%. Consumer prices in the U.K. and the US also rose much more significantly than in Germany, from 1 in 1960 to 22.6 and 10.3 in 2023, respectively. The average annual CPI inflation rates in Britain and the US are 5.1% and 3.8% during 1960-2023, respectively.

Price stability was achieved by the Bundesbank's restrictive monetary policies that provided a structural deflationary impulse for the German economy (Halevi 1995). As shown in **Figure 2.12**, during 1961-1990, the annual real long-term interest rate in Germany was, on average, 2 percentage points higher than real long-term interest rates in eleven other European economies (including France and Italy) and Britain — and 1.2 percentage points higher than in the US. Because of the relatively high cost of credit, German firms have always strongly relied on self-financing⁴¹ their investments: retained earnings constitute the most patient and, according to the pecking order theory of corporate finance (which emphasises information asymmetries), the cheapest form of financing for firms (Braun and Deeg 2020). Corporate bonds and equity were unimportant as sources of investment finance, but bank loans, also from banks abroad (where interest rates were lower; Halevi 1995), were important; until the 1980s, growth in foreign lending was mostly the result of banks accompanying domestic clients that expanded their

⁴¹ The average rate of self-financing was around 85% during 1960-69 (OECD Economic Survey: Germany 1969). The rate of corporate self-financing was circa 80% during 1970-1989, as is shown in this table:

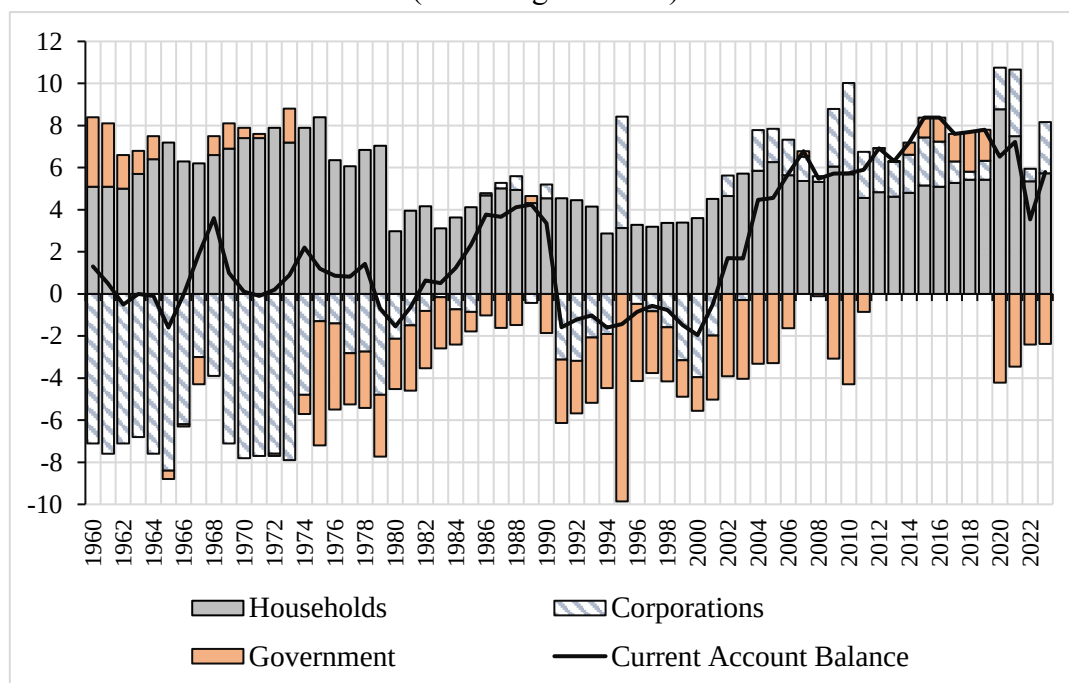
	1970-74	1975-79	1980-84	1985-89
Internal (retained profits)	68.6%	82.8%	79.8%	89.1%
Bank finance	15.7%	8.2%	11.1%	9.3%
Bonds	1.9%	-2.8%	-2.1%	0.4%
New equity	0.7%	0.5%	-0.5%	2.4%
Other	13.1%	11.3%	11.7%	-1.2%
Net sources of finance	100%	100%	100%	100%

Source: Corbett and Jenkinson (1996).

operations abroad. This reliance on external debt further reinforced the need for a strong and stable DM, both for Germany's corporations and its banks. As is shown in Figure 2.12, the corporate sector as a whole was a net borrower, as corporate investment exceeded corporate savings during 1960-1990.⁴² German banks were not just the main creditors of the non-financial corporations, but also often acted as shareholders and board members, overcoming the information asymmetries that usually afflict outside stakeholders, thus gaining considerable power over these non-financial corporations (Braun and Deeg 2020).

Figure 2.12

Net Lending of Households, Firms and Government: Germany (1960-2023)
(Percentage of GDP)



Sources: OECD Economic Surveys: Germany 1969 for the period 1960-1975; Deutsche Bundesbank Monthly Report (May issues of 1978, 1979 and 1980); AMECO database for the period 1980-2023. *Notes:* The figure is based on the national accounting identity that the current account balance of the balance of payments is equal to the sum of the financial balances of the private household, the corporate and the government sectors of the economy. The financial balances are defined as the difference between income and expenditure of each sector.

⁴² During 1960-1990, German households were also net lenders, whereas the German government was a net lender during the 1960s and a net borrower during the 1970s and the 1980s.

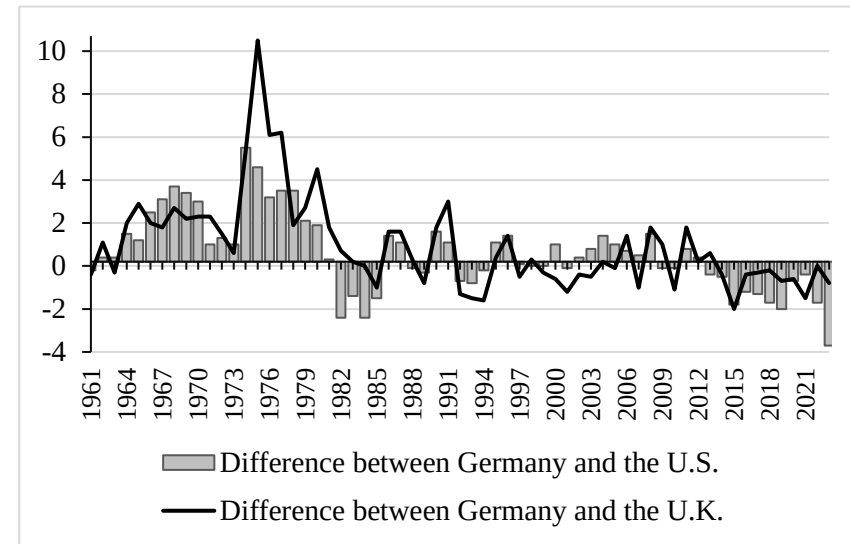
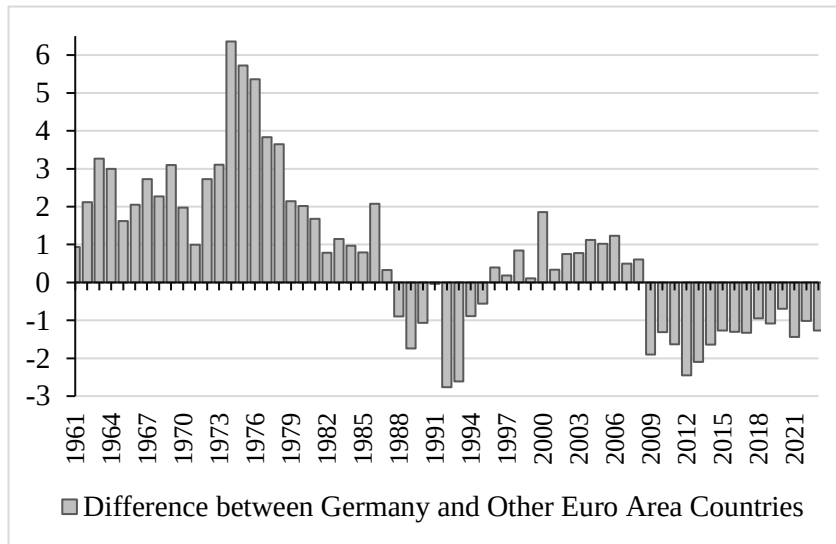
Unsurprisingly, Germany's high real interest rates and low inflation led to a strong Deutschmark (Figure 2.13). The strong Deutschmark (DM), in turn, helped the Bundesbank to stabilise the domestic price level by lowering the cost of imports (in domestic currency). Germany's real effective exchange rate appreciated by circa 8% in the early 1960s, then depreciated during 1964-1967, and rose by more than 36% during 1968-1976, which was one of the most turbulent periods in the world economy, due to the collapse of the Bretton Woods international monetary system, the explosion of prices of oil, gas and other raw materials and the persistence of a high and accelerating inflation in the OECD countries.

Importantly, Germany's share in global exports increased during 1968-1976, while the DM appreciated (Figure 2.6). The Deutschmark remained relatively strong until 1991, compared to the British Pound and the French Franc which both steadily weakened during 1960-1991 (Figure 2.13)

The fact that low and stable inflation is the *sine qua non* of Germany's export-dependent growth model, built around its financial-industrial complex and sustained by the Bundesbank, obviously implied that the country's fiscal policy had to be conservative as well. In Germany's model of export-dependent growth, there is no room for expansionary fiscal policies which may increase the tightness of the labour market and push up domestic wages and inflation. As can be seen in Figure 2.15, the net fiscal position of the German federal government was mostly in surplus during the 1960s, but in deficit during the stagflation of the 1970s. However, compared to its direct neighbour, France, and to the United States, the German fiscal position was, on average, more conservative during 1960-1990. The average annual budget deficit in the US during this period was 3.5% of GDP, compared to 1% in France and 0.8% in Germany.⁴³

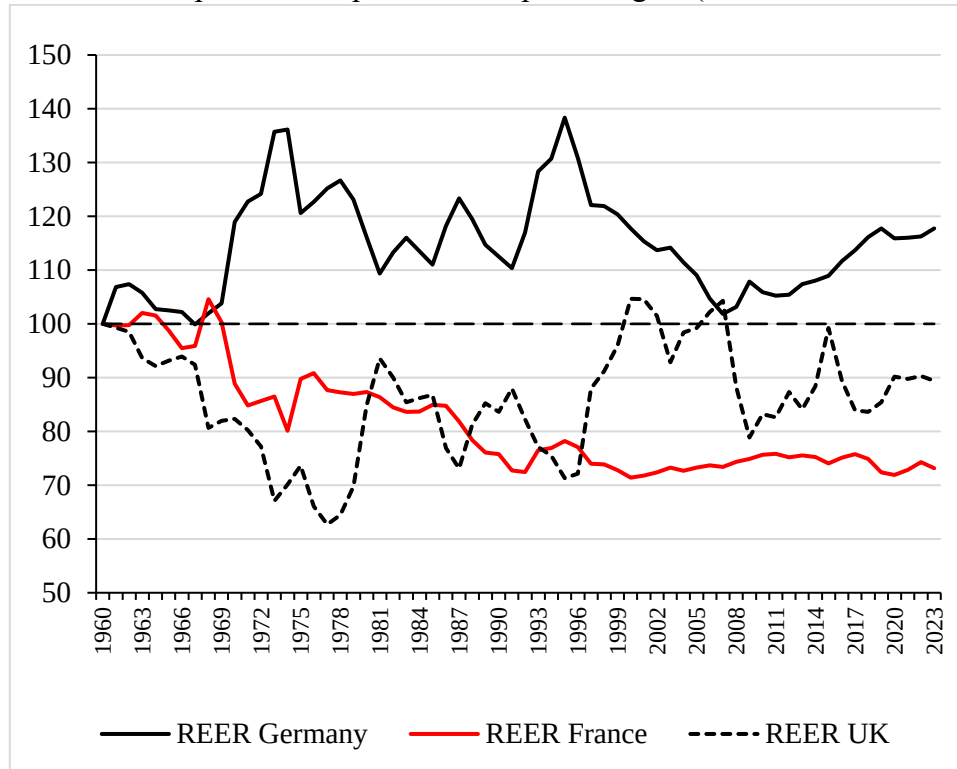
⁴³ This is well before Germany enshrined a “debt brake” in its constitution in 2009. The constitutional rule limits the federal government's structural deficit to 0.35 per cent of GDP, adjusted for the economic cycle, and effectively prohibits Germany's sixteen federal states from running any deficits at all.

Figure 2.13
Difference between Real Long-Term Interest Rates in Germany and Eleven Euro Area Countries, the U.K. and the US
(Percentage Points)



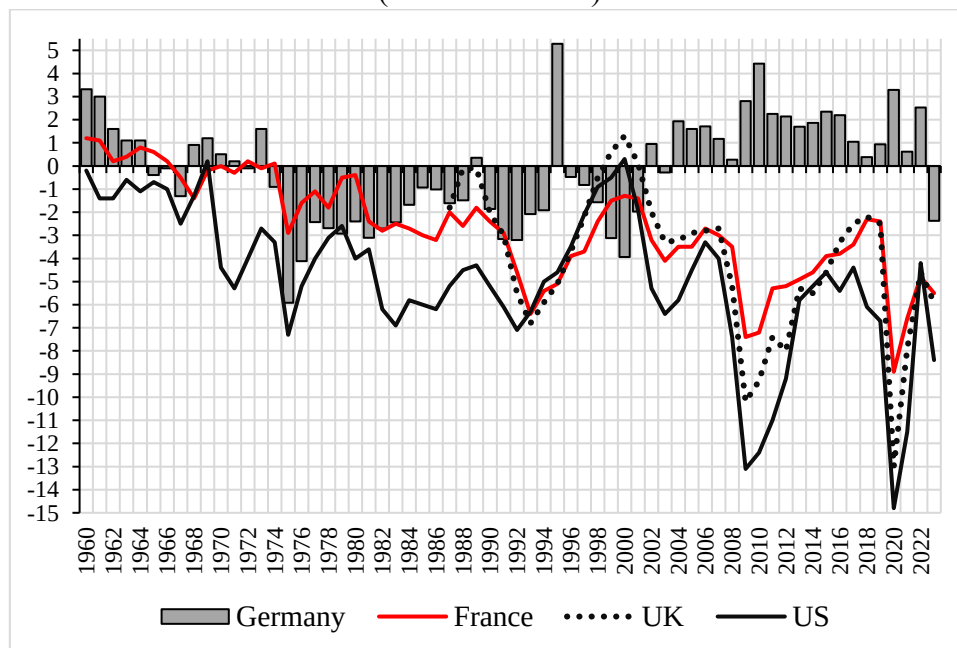
Source: Authors' calculations based on AMECO data. *Notes:* The national long-term rates consist of ten-year government bond yields. Long-term nominal interest rates are deflated by consumer price inflation. The German real long-term interest rate is compared to the weighted average real long-term interest rate of Austria, Belgium, Finland, France, Ireland, Italy, Luxembourg, the Netherlands, Luxembourg, Portugal and Spain. The real interest rates of the eleven Euro Area countries were aggregated using annual GDP (in euros) weights.

Figure 2.14
Real Effective Exchange Rates,
Relative to a Competitor Group, Double Export Weights (1960-2023; 1960 = 100)



Source: AMECO database.

Figure 2.15
Fiscal Deficit in Germany, France, the U.K. and the US: 1960-2023
(Percent of GDP)



Source: AMECO database. Notes:

The strong Deutschmark (DM) was not undisputed. Economists of the **Deutsches Institut für Wirtschaftsforschung** (DIW), Berlin, **ifo Institut für Wirtschaftsforschung** (ifo), München, and **Rheinisch-Westfälisches Institut für Wirtschaftsforschung** (RWI), Essen, criticised the Bundesbank for using the exchange rate to stabilize the domestic price level. In particular, they feared that this strategy would turn Germany into a high-price economy, which would cripple its export industries and cause a severe profit squeeze in the industrial sector (Schmidt 1997). This profit squeeze would hurt investment in R&D, innovation, and efficiency improvement, which would further undermine the competitiveness of German firms.

However, economists from the **HWWA-Institut für Wirtschaftsforschung** (HWWA), Hamburg, and the **Institut für Weltwirtschaft** (IfW), Kiel, welcomed the appreciation of the DM and underlined the positive effects of a strong DM, viewing it, in Schumpeterian fashion, as a vehicle for structural change and technological progress in the manufacturing sector.⁴⁴ Given a strong Deutschmark, only those export industries would be able to survive (in global markets) which succeeded in developing and producing new products and new production technologies and by widening capacities — in anticipating future demand (see also Lindlar and Holtfrerich 1996). German corporations could pursue long-term strategies of incremental innovation and efficiency improvements, because they were funded by patient (long-term) bank credit. Hence, the most remarkable feature of Germany's economy resided in the ability to transform the appreciation of the currency into an active instrument of industrial restructuring (Halevi 1995).

Germany's traditional industrial relations system provided another (Schumpeterian) spur to innovation and technological progress. We review Germany's industrial relations system in greater detail in **Section 2.4**. Suffice it for now to point out that wages and working conditions are determined by collective bargaining along sectoral lines between unions and employers' associations (or large firms). In the period 1960-1990, bargaining coverage was around 85%, while union density was around 35%. The employers' association organised firms with over 77% of the employees (Baccaro and Benassi 2017). The high coverage was also due to the relatively frequent declarations of collective agreements as 'generally binding'.

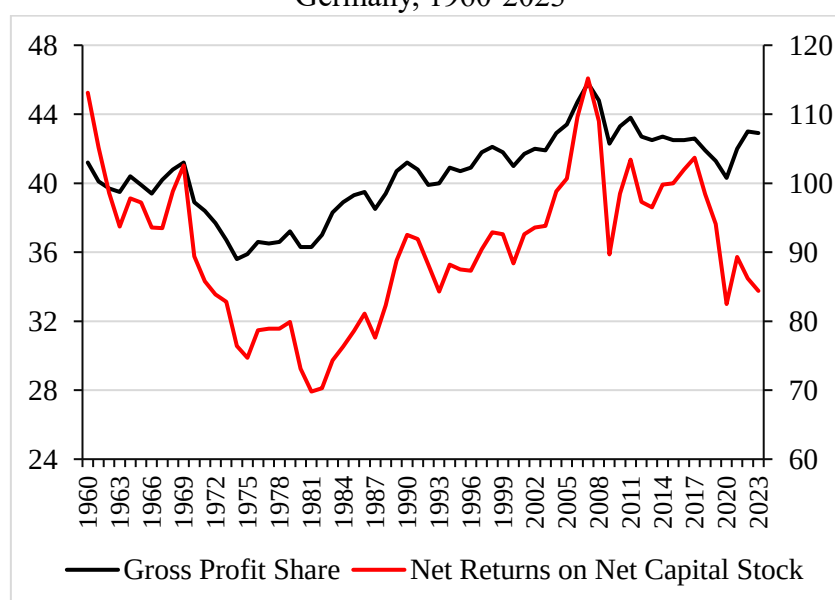
⁴⁴ DIW, ifo, RWI, HWWA and IfW are large economic research institutes that have been charged by the German Federal Government with the task of monitoring changes in the economy and sectoral structures since the beginning of the 1960s (Schmidt 1997).

In this traditional system, industry-level bargaining set uniform wage and working conditions not only within but also across sectors. Specifically, leading sectors such as the automotive industry (and, within sectors, leading regions) set the standard for wage increases throughout the economy. Germany's labour unions understood the rules of the game, set by the Bundesbank: real wages could at most grow in line with economy-wide labour productivity growth if inflation was to remain low and stable to ensure that the Bundesbank was not forced to further tighten policy. Hence, unions in the leading export-oriented sectors (such as the powerful union **IG Metall**) negotiated wage increases in line with *economy-wide* productivity gains, which were generally lower than sector-specific ones, in order to create a common wage floor for unions in less dynamic sectors; this system of 'pattern bargaining' redistributed income from workers in more productive sectors and companies to workers in less productive ones. Works councils enforced the application of sectoral agreements to all workers in the firm and the vertically integrated value chain (Baccaro and Benassi 2017). As a result, wage dispersion between industries and firms was relatively low, because low-productivity firms had to pay relatively high wages and high-productivity firms paid relatively low wages. In effect, the low-productivity firms had to raise labour productivity in order not to be pushed from the market, while the high profits earned by high-productivity firms strengthened incentives for productivity enhancements and structural change (Storm and Naastepad 2015).

Thus, the Bundesbank used the appreciation of the currency as an active instrument of industrial restructuring (Halevi 1995). This restructuring was further supported by Germany's coordinated system of collective wage bargaining that generated sufficient economy-wide wage restraint (under Bundesbank pressure), while furthering structural change in favour of the more innovative and productive firms. Bundesbank policies worked as far as German exports continued to grow rapidly notwithstanding the strong DM; as shown in **Figure 2.2**, German firms recorded an average growth rate of exports of 6.2% per year during 1961-1991. Bundesbank policies also worked in terms of productivity growth: labour productivity increased by 4.3% per year during 1960-1969 and by 2.9% per annum during 1970-1979. The relatively rapid productivity growth during 1960-1979 allowed strong real wage growth which was broad-based across industries and regions, which contributed to relatively strong growth of consumption spending (**Figure 2.2; Table 2.1**). This, in turn, stimulated business investment and domestic demand growth, while Germany's business sector managed to maintain a steady profit share in GDP (**Figure 2.16**).

However, this system of mutually reinforcing ‘beneficial’ constraints on German firms, unions and workers began to falter during the turbulent 1970s, due to rising prices of energy and commodities and also due to rising unit labour cost — as unions attempted to index nominal wages to the rapidly rising cost of living. In response to the rise in inflation, the Bundesbank tightened monetary policy — German real interest rates exceeded those in France, Britain or the US by 4 to 5 percentage points (**Figure 2.13**). Business investment in Germany took a serious hit, declining from around 25% of GDP in 1970 to circa 20% in 1981 — and with growth slowing down, German unemployment began to increase.

Figure 2.16
The Profit Share in GDP and Net Returns on Capital Stock:
Germany, 1960-2023



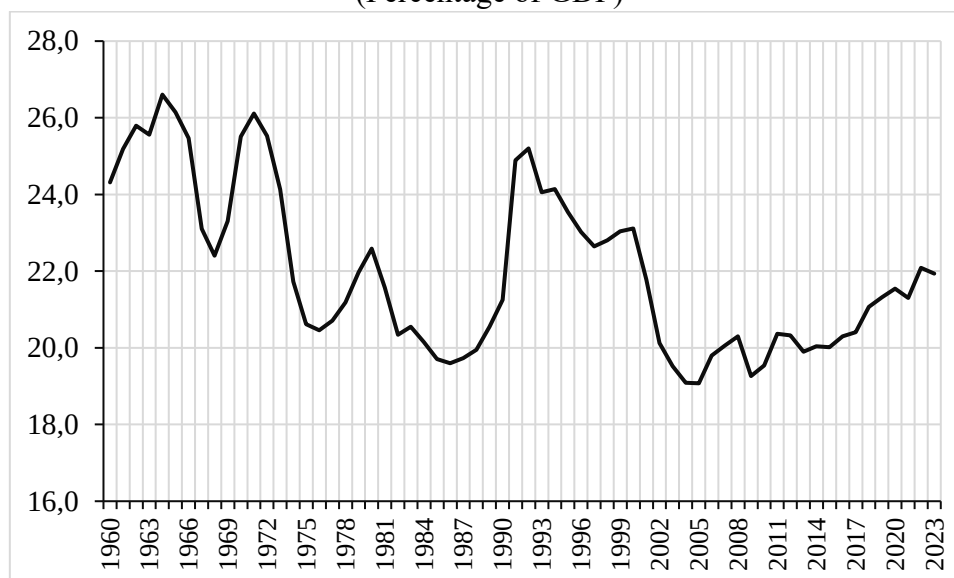
Source: AMECO database. *Notes:* The profit share is defined as 100% – the adjusted wage share (as percentage of GDP). Net returns on net capital stock are defined as an index (2015 = 100).

Businesses were hurt by declining profitability: the share of business profits in aggregate GDP dropped from 41.2% in 1969 to 37.2% in 1979, while net returns on the capital stock declined by more than one-fifth. The fact that average real wages were growing faster than labour productivity during 1969-79, including in Germany’s core manufacturing sector, contributed to the decline in the profit share and stalling fixed capital formation. The decline in investment, in turn, had a negative impact on productivity growth; after all, with fixed investment growth

down, the pace of embodied technological progress did slow down, as the average age of the installed capital stock rose.

The profit squeeze, the slowdown of growth and the rise in (structural) unemployment broke the system of ‘pattern bargaining’ (see **Section 2.4**). The erosion of the collective bargaining system impaired the ability of pattern bargaining to transfer productivity increases into wage increases and to redistribute between sectors. As a result, the disparity in earnings between industries and between occupations, which had been relatively low in international perspective during the 1960s and 1970s, began to rise in the 1980s and, more strongly, during the 1990s.

Figure 2.17
Gross Fixed Capital Formation: Germany, 1960-2023
(Percentage of GDP)

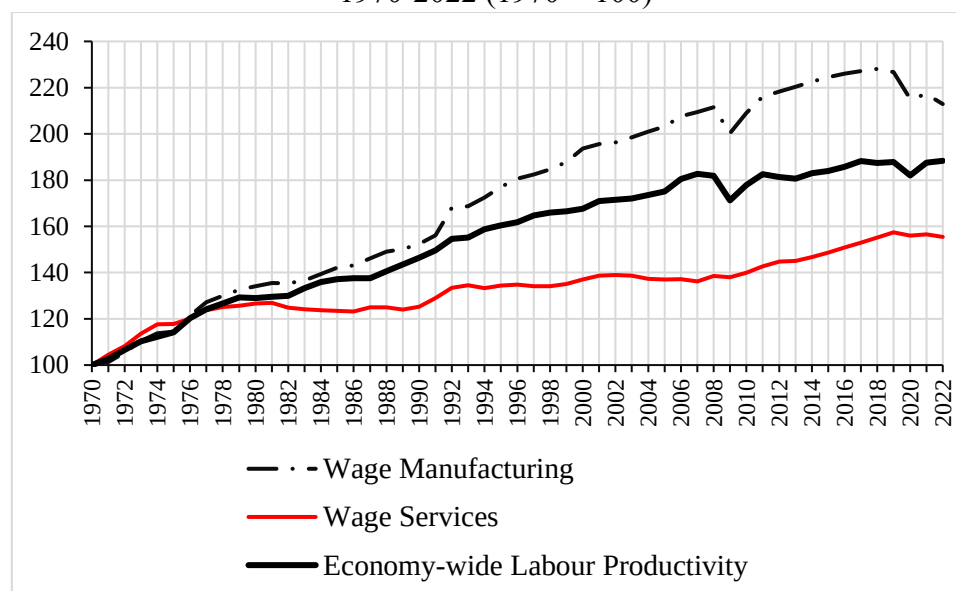


Source: AMECO database.

Evidence on the breakdown of ‘pattern bargaining’ appears in **Figure 2.18** which plots trends in the real earnings in Germany’s manufacturing sector and in services versus the trend in aggregate (or economy-wide) labour productivity. During the 1970s and until 1981, real wages grew at approximately the same rate as aggregate productivity in both sectors, but this changed thereafter, as manufacturing real wages began to grow faster than economy-wide productivity, while real wages in services grew more slowly. In fact, the average annual growth rate of manufacturing real wages during 1981-2022 was 1.1%, which is more than double the annual

growth rate of 0.5% per annum of real wages in services and exceeding the average annual growth rate of 0.9% of economy-wide labour productivity.⁴⁵

Figure 2.18
Real Wages in Manufacturing and Services and Economy-wide Labour Productivity,
1970-2022 (1970 = 100)



Source: Destatis Volkswirtschaftliche Gesamtrechnungen (Lange Reihen ab 1970). *Notes:* Real wages are real annual earnings per employee (in constant 2015 prices) and labour productivity is real GDP per employee.

Table 2.3 further illustrates the divergence in real wage growth between industries during the 1980s. During the 1970s, average real wage growth in manufacturing was 3.2% per year in manufacturing, compared to 2.6% per year in services. Crucially, real wage growth in low-productivity ‘other services’ was 2.4% per annum during 1970-79. Manufacturing real wage growth declined to 1.3% per year during the 1980s, as unemployment rose from 2.7% in 1980 to 7.2% in 1985 (**Figure 2.7**) following years of monetary tightening by the Bundesbank (**Figure 2.13**). Average annual real wage growth in services turned negative; real wage growth in ‘other services’ was -0.6% per year during 1980-89. It is evident that the system of ‘pattern bargaining’ faltered during the 1980s. The first signs of collective bargaining decentralisation emerged in the mid-1980s, when **IG Metall** conceded the introduction of opening clauses about

⁴⁵ According to Baccaro and Benassi (2017), wages in (high-end) manufacturing and (low-end) services began to diverge from 1991 onwards. According to our data, the dualization between manufacturing and services began a decade earlier — around 1981.

working time flexibility at the workplace in exchange for a 35-hour working week (Baccaro and Benassi 2017). The shorter work week was itself an instrument to deal with unemployment over time.

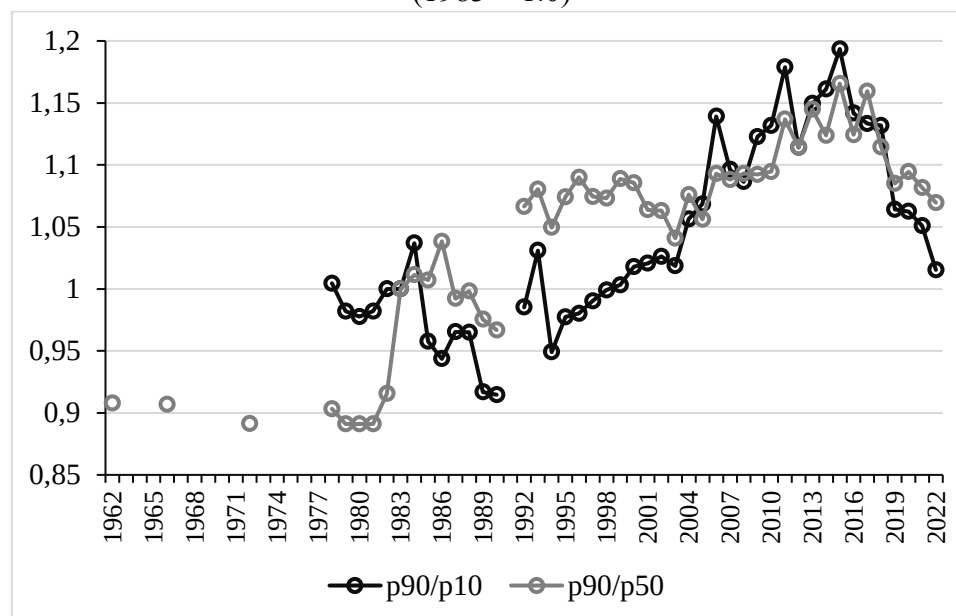
In line with the increasing divergence between wages in manufacturing and services, wage inequality in Germany as measured by the wage decile ratios p90/p10 and p90/p50 began to increase as well during the 1980s (Figure 2.19). Before 1995, the increase in wage inequality in Germany was not uniform, but restricted to an increasing dispersion in the upper part of the wage distribution (Dustmann *et al.* 2009; Antonczyk *et al.* 2018). Until the early 1990s, Germany's unions and its system of 'pattern bargaining' managed to contain a polarisation between median wage earners and the bottom 10% of wage earners, but following German unification, further de-unionisation, welfare reforms and a continued decentralisation of wage bargaining, wage dispersion in Germany increased monotonically between 1994-2016, both in the lower- and upper part of the distribution (Dustmann *et al.* 2014).

Table 2.3
Average Annual Real Wage Growth by Industry:
Germany (1970-2022) (Percent)

	Total	Manufacturing	Construction	Services			
				All Services	Wholesale, retail, hotels and restaurants	Information, Finance & Business Services	Other Services
1970s	2.8	3.2	2.3	2.6	2.4	3.0	2.4
1980s	0.3	1.3	0.2	-0.2	0.0	-0.1	-0.6
1990s	1.1	2.3	0.7	0.9	0.6	0.4	1.0
2000s	0.1	0.4	0.3	0.1	-0.1	0.3	-0.1
2010-2022	0.6	0.2	0.4	0.9	0.5	1.5	0.6

Source: Authors' calculations based on Destatis Volkswirtschaftliche Gesamtrechnungen (Lange Reihen ab 1970).

Figure 2.19
Decile Ratios of Earnings, c. 1962-2022
(1983 = 1.0)



Sources: The data for 1962-1978 are from Atkinson (2007); the data for 1976-1984 are from Abraham and Houseman (1993); the data for 1985-1991 are from OECD (2008); the data for 1992-2022 are “Decile ratios for gross earnings” from OECD statistics.

The decline in real wage growth and the simultaneous increase in wage inequality during the 1980s contributed to a slowdown of domestic demand and overall growth by depressing household disposable incomes. In turn, stagnant demand has negative effects on employment and, ultimately, wages and incomes. German reunification in 1991 reinforced the stagnationist tendencies that had already built inside Germany’s economy during the 1980s. The policy responses — monetary tightening, austerity and labour market deregulation — only intensified the stagnation of domestic demand, and made the German economy even more dependent on export growth than before (Hein and Trüger 2005; Carlin and Soskice 2009).

2.4. From Sick Man of Europe to Economic Superstar and Back

Initially, German reunification led to a short-lived boom which prevented the economy from sliding into the world recession of 1991.⁴⁶ But the boom led to rising inflation, while unemployment increased, because East Germany's unemployment rates were three times higher than those in West Germany. The country's social welfare system was extended to Eastern Germany, and the government further committed itself to quickly raising Eastern German production potential via public investment and generous subsidies to attract private investment. The budgetary cost of these policies was increased by the decision to rapidly raise Eastern German wages to Western German levels. This resulted in heavy job losses and greatly increased the government's unemployment compensation costs, as well as wage costs in government-owned firms being prepared for privatization. The large fiscal transfers from West to East Germany did swing the government's budget from a surplus of 0.3% of GDP in 1989 to a deficit of circa 3% of GDP on average per annum during 1991-1993. The German government narrowed the federal budget deficit through a variety of tax and fee increases, public spending restraint and cuts in certain social benefits. The increase in administered prices and taxes contributed to the overall acceleration in the inflation rate (Hein and Trüger 2005).

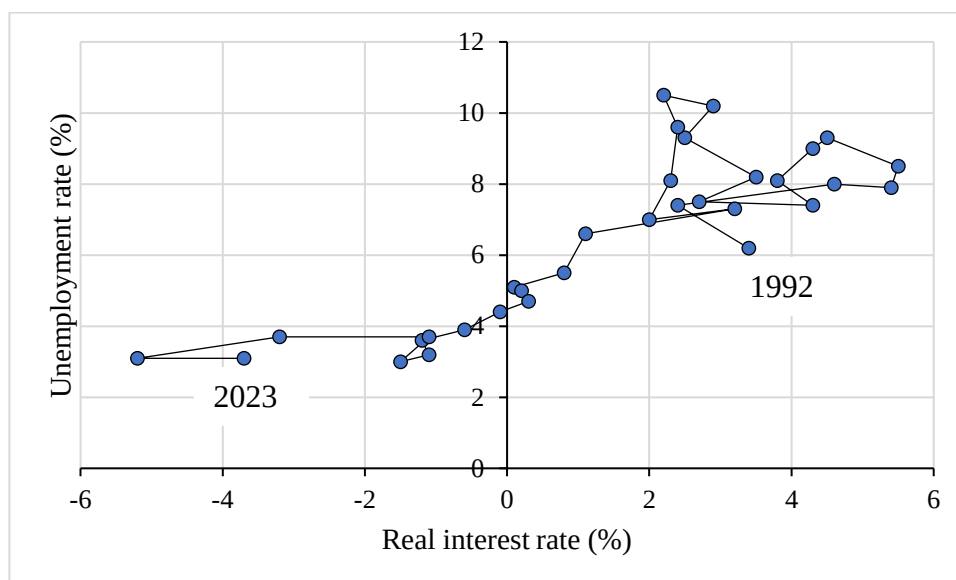
The Bundesbank, predictably, prioritised inflation control over curbing growing unemployment and severely tightened monetary policy (from 1992 onwards), raising the nominal interest rate to 8.75% and forcing the central banks in other EMS countries to follow suit (Höpner and Spielau 2018). The German economy was forced into a serious recession by the Bundesbank's tight monetary policy and did not manage to recover to previous strength in the following period. As is shown in **Figure 2.20**, high real interest rates are associated with high unemployment rates in Germany.⁴⁷ Mostly due to the restrictive monetary policy stance, Germany's unemployment rate rose from 5.2% in 1991 to 9.3% in 1997 (**Figure 2.7**; Hein and Trüger 2005; Carlin and Soskice 2009), while the average unemployment rate in the EU remained relatively constant at the same time. Because of its unemployment crisis, Germany

⁴⁶ This paragraph is based on Lindlar and Scheremet (1998). In this paper, we do not address German unification and its effects on German economic performance during 1991-2023.

⁴⁷ Monetary tightening by the Bundesbank also helped trigger a much larger crisis in the EMS (1992-1993) and a recession in most of Western Europe.

was widely derided as ‘the sick man of the Euro’ (The Economist [1999](#)), stagnant, and ridden by political paralysis in reforming its economy to address the unemployment problem.

Figure 2.20
Germany: Real Interest Rate and Unemployment Rate (1991-2023)



Source: AMECO database.

The roots of Germany’s unemployment crisis of the 1990s were widely, and incorrectly, believed to lie in the ‘rigidity’ of its labour market which had led to rigid and high wages (Siebert 1997; Sinn 2006). In line with this diagnosis, Germany’s government implemented drastic labour market reforms already during the 1990s, with the aim to weaken the bargaining power of unions, undermine the system of pattern bargaining and suppress (real) wage growth. Germany’s labour market reforms during 1990-1999 were among the most far-reaching in the OECD area (Carlin and Soskice 2009; Hein and Truger 2005): Germany ranked #4 (out of 30 countries) in terms of the OECD’s measure of aggregate reform intensity during the period 1994-2004 (Brandt, Burniaux and Duval 2005).

But the unemployment rate stubbornly refused to go down. Concerns about the high rate of unemployment dominated Germany’s 1998 federal election campaign. After sixteen years the coalition of Christian Democrats (CDU/CSU) and Liberals (FDP) led by Chancellor Helmut Kohl was voted out of office and replaced by a coalition of Social Democrats (SPD) and the Greens. In his new government’s first policy statement, Chancellor Gerhard Schröder (SPD) named the high unemployment rate the most pressing and painful problem (Schröder 1998).

Unemployment policy was turned into *Chefsache*, and the necessary reform effort would be driven by the Chancellery. The SPD-led effort culminated in the Hartz reforms of 2003-2005 which further intensified the labour market deregulation that had already been ongoing (Storm and Naastepad 2015).

Major dimensions of labour market deregulation in Germany are summarised in **Table 2.4**, which lists six institutional indicators (index of employment protection, benefit replacement rate, union density, bargaining coverage, bargaining coordination and tax wedge) for Germany for twelve five-year-periods from 1960 to 2019 and for 2020-2022. Employment protection, both of regular and temporary jobs, started to decline in the second half of the 1980s and was further reduced in the 1990s and the early 2000s, especially for temporary contracts. This is important, since the share of temporary employees in the total number of employees steadily rose from 3.5% during 1980-84 to 8.6% during 2010-14. Union density declined from 35% in the early 1980s to 16.8% in 2015-2019, while collective bargaining coverage declined from 85% in the 1980s to 50.8% in 2020-22. Only one indicator, the tax wedge, has consistently grown during 1960-1990 with considerable increases during the 1990s. This, however, can be explained in the first place by rising unemployment costs levied on labour and in the second place by the costs of German unification which were predominantly financed via the welfare system (Hein and Truger 2005).

German reunification, and high unemployment in Eastern Germany, reinforced the already existing trend to decentralised bargaining and exceptions to industry-level collective agreements. Notably, after the Eastern German economy collapsed, **Gesamtmetall** (the metalworker employer federation), responding to the pressure of small and medium-size enterprises in Eastern Germany, forced **IG Metall** to accept ‘opening clauses’ at the company level, which gave employers the possibility to opt out of sectoral bargaining. Following these developments in Eastern Germany, the pressure for lower wage levels and flexible company-level solutions grew also from Western German small- and middle-sized companies. Thus, Germany’s employers’ associations introduced the option of membership without applying the sectoral agreement (*i.e.*, **OT-Mitgliedschaften**). The simultaneous opening up of Eastern European economies heightened the pressure on wages, as German employers used (the threat of) relocation to force through wage moderation.

Table 2.4
Indicators of Labour Market Institutions: Germany (1960-2022)

Period	EPL index regular contracts	EPL index temporary contracts	Temporary employment	Benefit replacement ratio	Union density	Collective bargaining coverage	Bargaining Coordination	Tax wedge
1960-64	1.20	—	—	42.7	33.8	85.0	2.5	42.9
1965-69	1.24	—	—	41.9	32.4	85.0	2.5	42.8
1970-74	2.30	—	—	39.7	32.5	85.0	2.5	46.7
1975-79	2.90	—	—	39.6	35.1	85.0	2.5	48.3
1980-84	2.90	—	3.5	38.8	35.0	85.0	2.5	49.7
1985-89	2.90	3.60	4.8	37.8	33.5	85.0	2.5	50.5
1990-94	2.60	3.25	5.8	37.4	32.7	85.0	2.5	52.2
1995-99	2.26	2.55	6.7	36.3	27.0	75.1	2.5	53.9
2000-04	2.10	1.70	6.8	—	23.4	67.3	—	52.5
2005-09	2.10	1.00	8.4	—	19.9	62.3	—	51.7
2010-14	2.10	1.05	8.6	—	18.3	58.6	—	49.4
2015-19	2.10	1.23	8.3	—	16.8	54.8	—	49.4
2020-22	—	—	7.6	—	—	50.8	—	48.3

Sources: (1) EPL regular contracts: Allard (2005) for 1960-64 to 2000-04; OECD Indicators of Employment Protection for 2005-09 to 2015-19 (re-scaled to match Allard's scale); (2) EPL temporary contracts: OECD Indicators of Employment Protection – temporary contracts; (3) Benefit replacement ratio: Hein and Truger (2005); (4) Union density: Hein and Truger (2006) for 1960-64 to 1995-99; OECD data on trade union density for 2000-04 to 2015-19; Kohaut and Hohendanner (2024) for 2020-22; (5) Collective bargaining coverage: OECD data for 1960-64 to 1995-99; Kohaut and Hohendanner (2024) for 2000-04 to 2020-22; (6) Bargaining coordination: Hein and Truger (2005); and (7) Tax wedge: Hein and Truger (2006) 1960-64 to 1995-99; OECD statistics for 2000-04 to 2020-22. *Notes:* (i) The EPL indices are on a scale of [0, 6]; (ii) The numerical values for the EPL indices for regular contracts and for temporary contracts are not comparable, because their sources are different; (iii) Benefit replacement rate before taxes as percentage of previous income before taxes. Average values for two income levels (100 % and 67 % of average income) and three family types (single, family with one earner, family with two earners); (iv) Union density is defined as employed union members as percentage of total employed; (v) Collective bargaining coverage is employees with the right to bargain as a percentage of all employees; and (vi) Tax wedge reflects the total average labour tax burden (payroll taxes, social security contributions, labour income tax, consumption taxes) on labour cost.

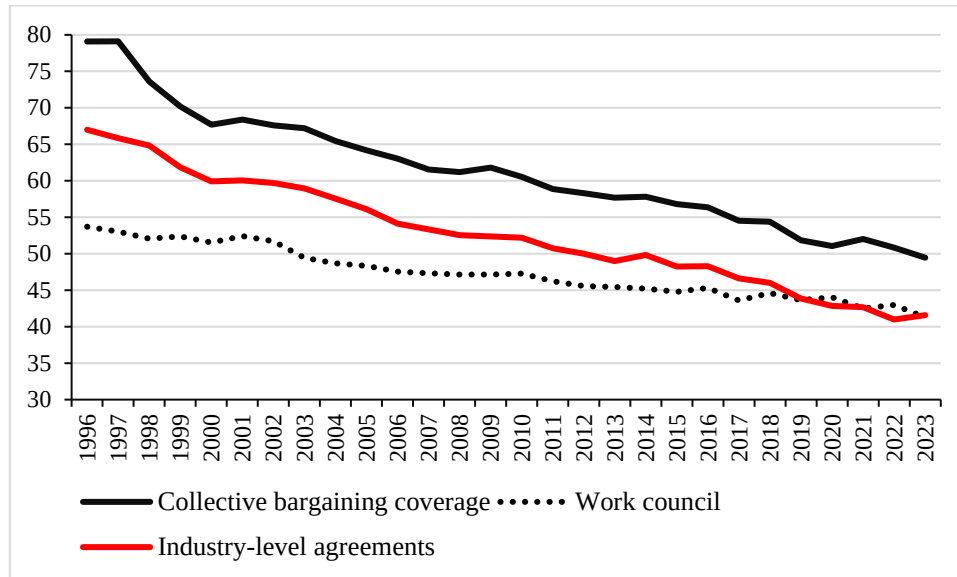
These instances of partial decentralization of bargaining to the firm level — through flexibility provisions in sectoral agreements, or direct negotiations between individual firms and sectoral unions — resulted in a gradual erosion of bargaining coverage over time. According to data provided by the *Establishment Survey* of the **Institute of Employment Research of the German Federal Employment (IAB)**, Germany has experienced a significant decline in collective bargaining coverage, from 79 per cent in 1996 to 49 per cent in 2023 (**Figure 2.21**). The decline is mostly due to the drop in the percentage of workers covered by industry-level agreements, which decreased from 67% in 1996 to 42% in 2023. The coverage by industry-level agreements has declined due to the far more frequent use of so-called ‘opening clauses’. As a result, firms are increasingly involved in negotiations about wages and working time, which previously, at least formally, was the sole prerogative of unions at the industry level. The percentage of workers working in firms having a work council has also declined: from 54% of all workers in 1996 to 41% in 2023 (**Figure 2.21**).⁴⁸ The percentage of workers without any coverage of collective agreements and works councils has increased from 18% of all workers in 1996 to 42% in 2023 (Hohendanner and Kohaut 2024).

The decline in the share of the workforce in private industry covered by both a works council and a collective agreement illustrates the extent of the erosion of the German dual industrial relations system as an institutional power resource of unions. This dual system consists of collective bargaining at the industry level and worker participation at the company and the establishment level. Unions conclude industry-level collective agreements with employers’ associations or individual employers, and works councils (which can be set up in establishments with more than five employees) represent the employees’ interest within companies and establishments through a multi-level system of information, consultation, ongoing dialogue and codetermination rights (Jäger *et al.* 2022).⁴⁹ But this system has changed.

⁴⁸ Bargaining coverage also differs considerably across industries. In traditional union strongholds, such as chemicals and the automotive industry, coverage remains relatively high.

⁴⁹ In addition to representation at the workplace level, there is a system of board-level employee representation based on the 1976 Codetermination act (**Mitbestimmungsgesetz**), which in companies with at least 2,000 employees entitles employee representatives to 50% of the seats on a company’s supervisory board. In smaller companies, with 500–2,000 employees, the **BetrVG** provides for one-third employee representation on supervisory boards. Board-level representation gives employees privileged access to strategic information and therefore some influence over management decisions.

Figure 2.21
Collective Bargaining Coverage and Workers in Firms Having a Work Council:
Private Industries and Public Sector (1996-2023)
(Percentage of All Employees)



Source: IAB – *Establishment Surveys* 1996-2023; and Hohendanner and Kohaut (2024).
Notes: Workers covered by collective agreements (at the industry and/or firm level) as a percentage of all workers; and workers working in firms that have a work council as a percentage of all workers.

Following the structural reforms of the labour market (including those that had started already during the 1990s), Germany’s unemployment rate began to decline: after peaking at 10.5% in 2005, the unemployment rate fell to 3.2% in 2020 (**Figure 2.7**). The rather spectacular decline in unemployment was widely noticed and Germany has since been praised as a ‘jobs miracle’ (Krugman 2009), a ‘labour market miracle’ (Burda and Hunt 2011) and an ‘economic superstar’ (Dustmann *et al.* 2014).

The ‘jobs miracle’ concerns the way Germany succeeded in navigating the Global Financial Crisis in 2009, relying on its system of ‘Kurzarbeit’ to keep mass unemployment at bay. In this scheme, workers who have been temporarily furloughed but are kept on the payroll, receive “Kurzarbeitergeld” or “short-work money” from the Federal Labour Office (FLO), the agency that is also responsible for issuing unemployment benefit. The scheme promises them 60 per cent of their pre-crisis pay. Relying on the internal flexibility provided by the ‘Kurzarbeit’ scheme, the German unemployment hardly increased during the recession of 2008-09, very modestly increasing from 7% in 2008 to 7.2% in 2009 — a much smaller increase in

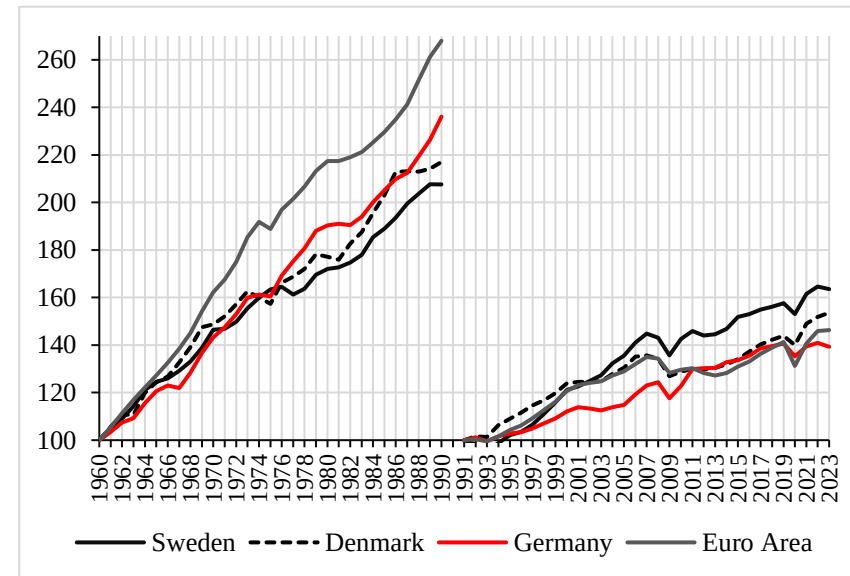
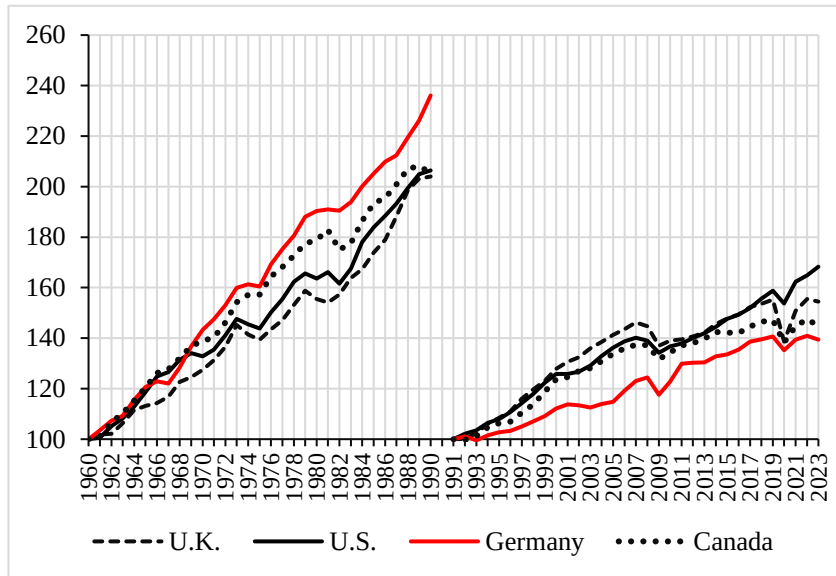
unemployment than in other OECD countries (Burda and Hunt 2011). However, the German unemployment rate continued to fall in the following years, declining to 3.2% in 2020 (Figure 2.7). The trend decline underlies Dustmann *et al.*'s (2014) claim that Germany had become an 'economic superstar'; Germany was held up as a 'strong reference model for other countries', especially the Southern European countries (Rinne and Zimmermann 2012).

How did Germany bring about this much heralded *structural decline* in its unemployment rate? As Figure 2.22 shows, the fall in unemployment was not caused by 'superstar' economic growth. Far from it, in fact. Germany's economic growth during 2005-2011 (measured in terms of real GDP per capita) distinctly non-spectacular, and close to the economic growth rates achieved by major other countries including the US, the other Euro Area countries, Canada, the U.K. and Sweden — even if Germany managed to lower the unemployment rate more strongly than most of these countries.

Germany 'superstar' job growth is also not caused by exceptional growth of hours worked in the economy, but rather by what Carrillo-Tudela, Launov and Robin (2021) call 'work sharing': following the Hartz reforms, large numbers of unemployed workers ended up accepting low-paid part-time work that was offered in quantity in the absence of a universal minimum wage and that came in the form of either regular part-time contracts or mini-jobs, the latter being low-pay flexible-hours employment that is not subject to social security contributions and income taxation and that also is not enjoying full social protection.

Mini-jobs became attractive as secondary employment due to the tax benefits provided by the Hartz II reforms (Burda and Seele 2016), which lifted the earnings threshold to 400 euro per month (450 euro as of 2013), abolished the weekly working hours ceiling of 15 hours and, indeed, allowed for marginal part-time work as a second job. There is evidence that regular part-time and full-time jobs have been crowded out by these mini-jobs, and employers, especially in retail trade or hotels and restaurants, where most of the mini-jobs are concentrated, have reaped part of the benefits on the employee side by reducing gross hourly wages (Eichhorst and Tobsch 2015).

Figure 2.22
Real GDP Per Capita in Germany and Selected Countries (1960-1990 versus 1991-2023)
(Index 1960 = 100 and Index 1991 = 100)



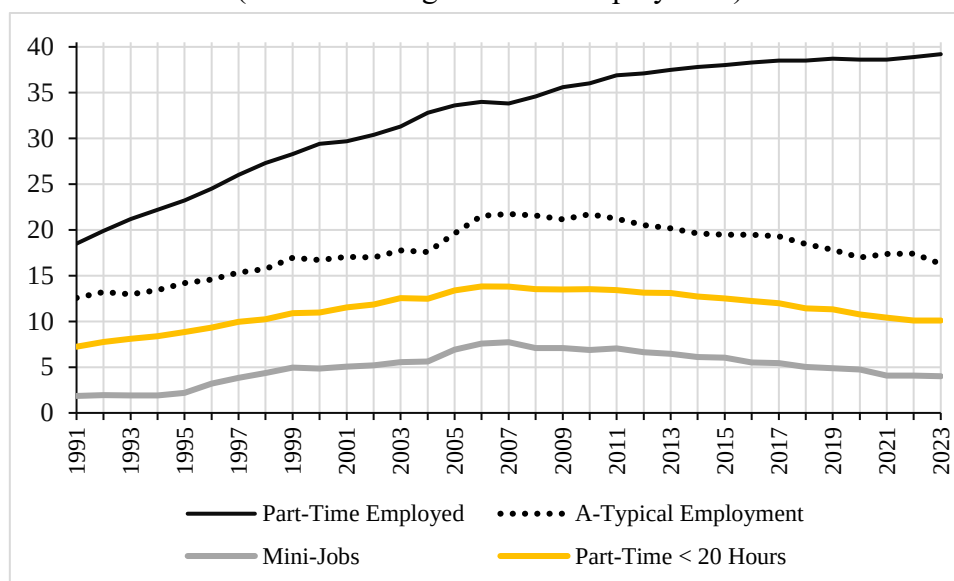
Sources: World Development Indicators and AMECO database. *Note:* The Euro Area consists of Austria, Belgium, Finland, France, Greece, Ireland, Italy, Luxembourg, The Netherlands, Portugal and Spain.

In addition, the Hartz IV reform, implemented in January 2005, imposed tighter conditions on (long-term) unemployment benefit recipients, introducing means-testing at the household level, lowering benefits for the long-term unemployed, imposing stricter job suitability criteria and introducing more effective job placement schemes (Eichhorst and Tobsch 2015). Because circa three quarters of long-term unemployed workers were not able to pass the means-test and lost their benefits and also because repeated refusals to accept job offers that are considered suitable lead to benefit cuts, many of the formerly unemployed workers stopped showing up at the job centres and decided to take up mini-jobs (Carillo-Tudela *et al.* 2021). In effect, they disappeared from the unemployment statistics and now show up as being employed, albeit often for only a few hours per week.

Hence, as a result of the Hartz reforms, in Germany, part-time labour as well as other non-standard (a-typical) forms of labour have developed at a much faster rate than in other economies in Europe (Eichhorst and Tobsch 2015; Carillo-Tudela *et al.* 2021). As is shown in **Figure 2.23**, the share of part-time employment in total employment in Germany rose from 33.6% in 2005 to 39.2% in 2023; it must be noted that a significant proportion of these part-time jobs are for fewer than 20 hours per week. The share of *a-typical* employment (which includes mini-jobs, fixed-term contracts, temporary agency work and part-time jobs of less than 20 hours per week) in total employment rose to a peak of 21.7% in 2010 and declined to 16.3% in 2023. By 2014 there were about 3.54 million mini-job contracts in Germany, but only about 2 million workers had a mini-job as primary employment; the other 1.5 million workers used mini-jobs as secondary employment (Carillo-Tudela *et al.* 2021).

The Hartz reforms have profoundly changed the structure of German employment. First, as can be seen in **Figure 2.24**, the proportion of ‘inactive’ people in the working-age population declined significantly — from 21% in 2005 to 12% in 2023. This was achieved by a sustained reduction in unemployment (from 7.7% of working-age population in 2005 to 2.5% in 2023) and a steady rise in the employment rate — from 71.4% of working-age population in 2005 to 85.5% in 2023. The increase in the employment rate was mostly due to greater labour force participation of women in a-typical employment. Germany’s current employment rate is substantially higher than the long-standing average of 70 % that prevailed during the 1990s and early 2000s (Eichhorst and Tobsch 2015).

Figure 2.23
Part-Time Employment, A-Typical Employment and Mini-Jobs: 1991-2023
(As a Percentage of Total Employment)

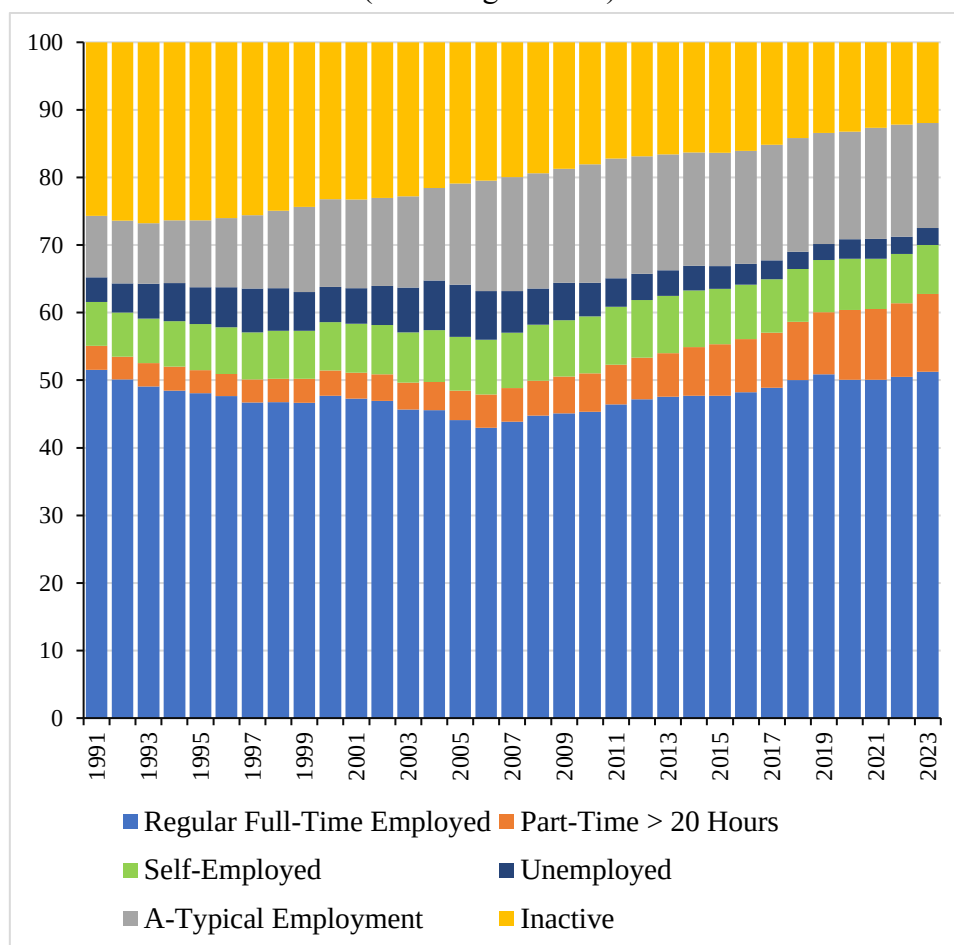


Source: IAB (2024).

Second, the increase in the employment rate was accompanied by steady rises in part-time employment (of more than 20 hours per week) and in a-typical employment (Figure 2.24). As a result, the average annual number of hours worked per German employee declined steadily over time. This is shown in Figure 2.25: the average annual number of hours worked per employee in Germany declined from 1554 in 1991 to 1432 in 2005, dropping to 1335 in 2023. It can be seen that the number of hours worked in Germany is far below the average annual number of hours worked in the OECD area: while the average German worker toils during around 1350 hours per year, the average worker in the OECD area puts in circa 1750 hours, or 400 hours more per annum, which means 10-11 additional working weeks (in full-time equivalent terms). Hence, the main route that Germany used to lower unemployment is by lowering the average annual number of hours worked per worker — that is, by sharing available hours of work rather than creating extra hours of work in the economy.

Figure 2.24

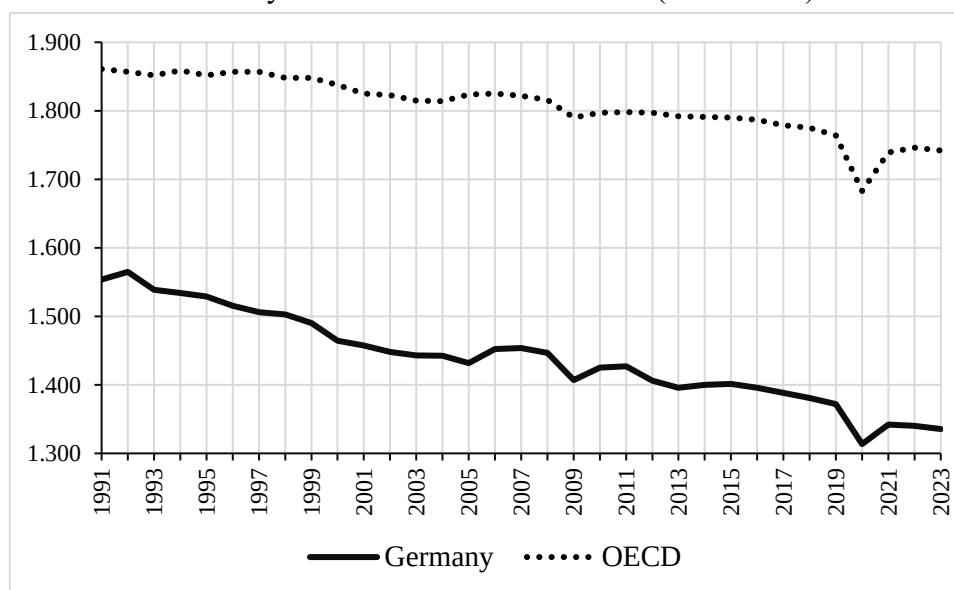
Working-Age Population (15-64 Years) by Employment Status: Germany (1991-2023)
(Percentage Shares)



Sources: AMECO and IAB (2024).

In fact, the many ‘mini-jobs’, ‘one-person firms’ and ‘one-euro jobs’ for which reforms have paved the way since 2003-2005 cloud the view of the real world and create the impression of a ‘jobs miracle’ where, in actual fact, there was none. **Table 2.5** illustrates the point. The official statistics recorded an increase of 6.79 million employed workers during 2005-2023, as the number of hours worked in the economy rose by 5.1 billion hours and the labour force expanded by 3.69 million persons. Note that Germany’s official unemployment rate declined from a peak of 10.5% in 2005 to 3.1% in 2023.

Figure 2.25
Average Annual Hours Worked per Employee:
Germany versus the OECD Countries (1991-2023)



Sources: IAB (2024) and OECD Statistics.

However, as outlined above, most of these newly employed workers work part-time, often in mini jobs. If part-time jobs are recalculated as full-time equivalents (fte),⁵⁰ the picture drastically changes. It then becomes evident that Germany created only 3.12 million new (fte) jobs during 2005-2023 (instead of 6.79 million mostly part-time jobs). Hence, Germany's unemployment rate in 2023, defined in fte, would have been 11%, *i.e.*, higher than the unemployment rate of 10.5% in 2005.

The upbeat employment performance in Germany was made possible by redistributing the available hours of work between more employees. This was achieved by creating around 4.8 million part-time jobs dominated by women and older workers during 2005-2023. Germany brought down its unemployment rate by a strategy of work sharing, driven by the harsh Hartz reforms that drastically lowered (long-term) unemployment benefits and encouraged the creation of low-paid, flexible, part-time work, at the cost of increasing inequality in wages and household incomes at the bottom, as these low-quality jobs do not, in general, constitute stepping stones to full-time jobs (Carillo-Tudela *et al.* 2021).

⁵⁰ Based on IAB data, German employees working full-time worked 1645 hours on average per year during 2005-2023.

Table 2.5
Job Creation and Change in Unemployment in Germany (2005-2023)

	change during 2005-2023:	Realisations	1 fte = 1645 hrs/year
	increase in hours worked (million hours)	5132	5132
a.	actual unemployment rate in 2005 (%)	10.5%	10.5%
b.	# of unemployed in 2005 (millions)	4.56	4.56
c.	- increase in labour force (millions)	3.69	3.69
d.	- increase in # of employed (millions)	6.79	3.12
	# of unemployed in 2023 (millions) = (a) + (b) – (c)	1.46	5.13
e.	Δ unemployment rate between 2005 – 2022 (%)	-7.4%	+0.5%
	unemployment rate in 2023 (%) = (a) – (e)	3.1%	11.0%

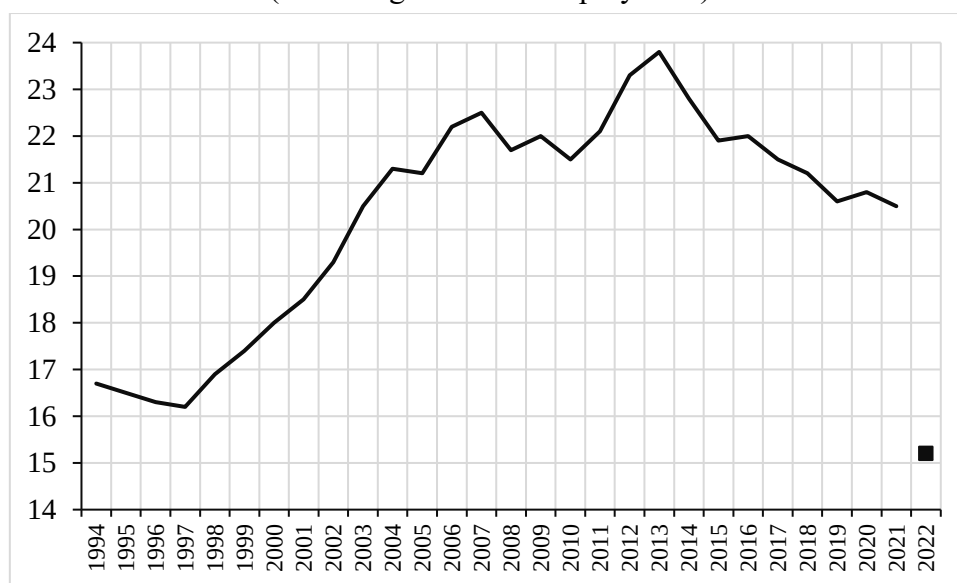
Source: Calculated by the authors based on data from AMECO and Destatis, *Lange Reihen*.

Following the labour market reforms, Germany's low-wage sector expanded considerably: the share of workers earning two thirds or less of the national median gross hourly earnings in total workers rose from 16.2% in 1997 to 21.2% in 2005, peaking at 23.8% in 2013. This means that almost one in four German workers earned two thirds or less of the national median gross hourly earnings — compared to fewer than 9% of French workers and 16.4% of EU workers (in 2014).

The massive work sharing is associated with rising inequality in earnings (see **Figure 2.19**) and in (disposable) household incomes (Carillo-Tudela *et al.* 2021; Grabka 2024). **Figure 2.27** presents the average annual growth rates of real disposable household income by deciles during 1995-2021 (based on Grabka 2024). It can be seen that the real disposable income of the bottom 10% of German household has remained stagnant ever since the mid-1990s, exhibiting no meaningful increase. The real disposable incomes of the second, third and fourth deciles increased by 0.48%, 0.73% and 0.93% per year during 1995-2021, respectively, whereas mean disposable household income rose by 1.17% per year. These relatively meagre growth rates are consistent with the overall poor performance of Germany's economy since 1991 (**Figure 2.22**) and the large degree of wage moderation experienced by the majority German workers during

this period. The richest households in the ninth and tenth decile experienced the highest real income growth during 1995-2021 (see Figure 2.27).

Figure 2.26
Low-Wage Employment in Germany (1994-2022)
(Percentage of Total Employment)

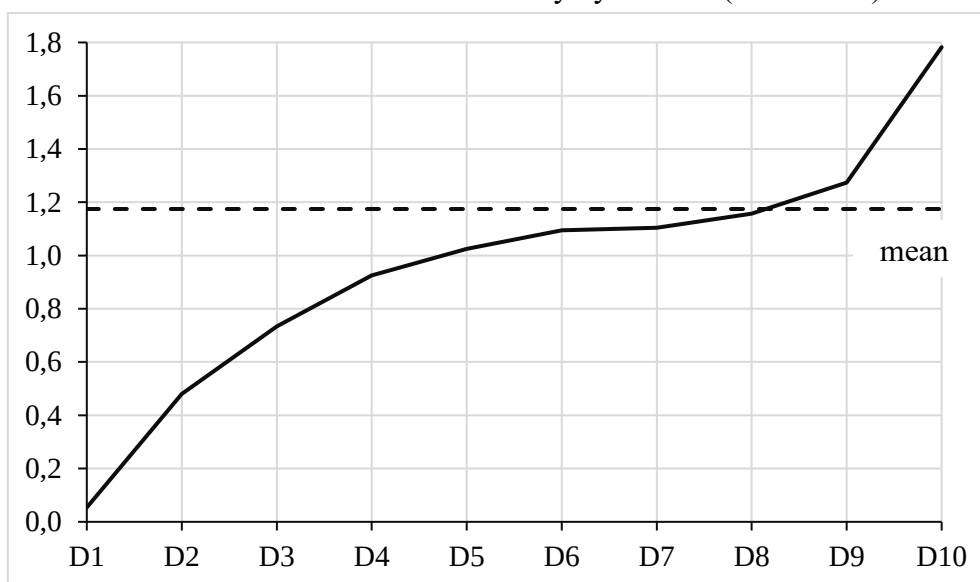


Source: Socio-Economic Panel SOEPv38. Calculations by DIW Berlin (Grabka 2024).

Note: The share of low-wage employment declined from 20.5% in 2021 to 15.2% in 2022 following the increase in the minimum hourly wage from €10.45 to €12 in 2022 (Grabka 2024).

Figure 2.27

Average Annual Growth Rates of Needs-Adjusted Real Disposable Income of Private Households in Germany by Deciles (1995-2021)

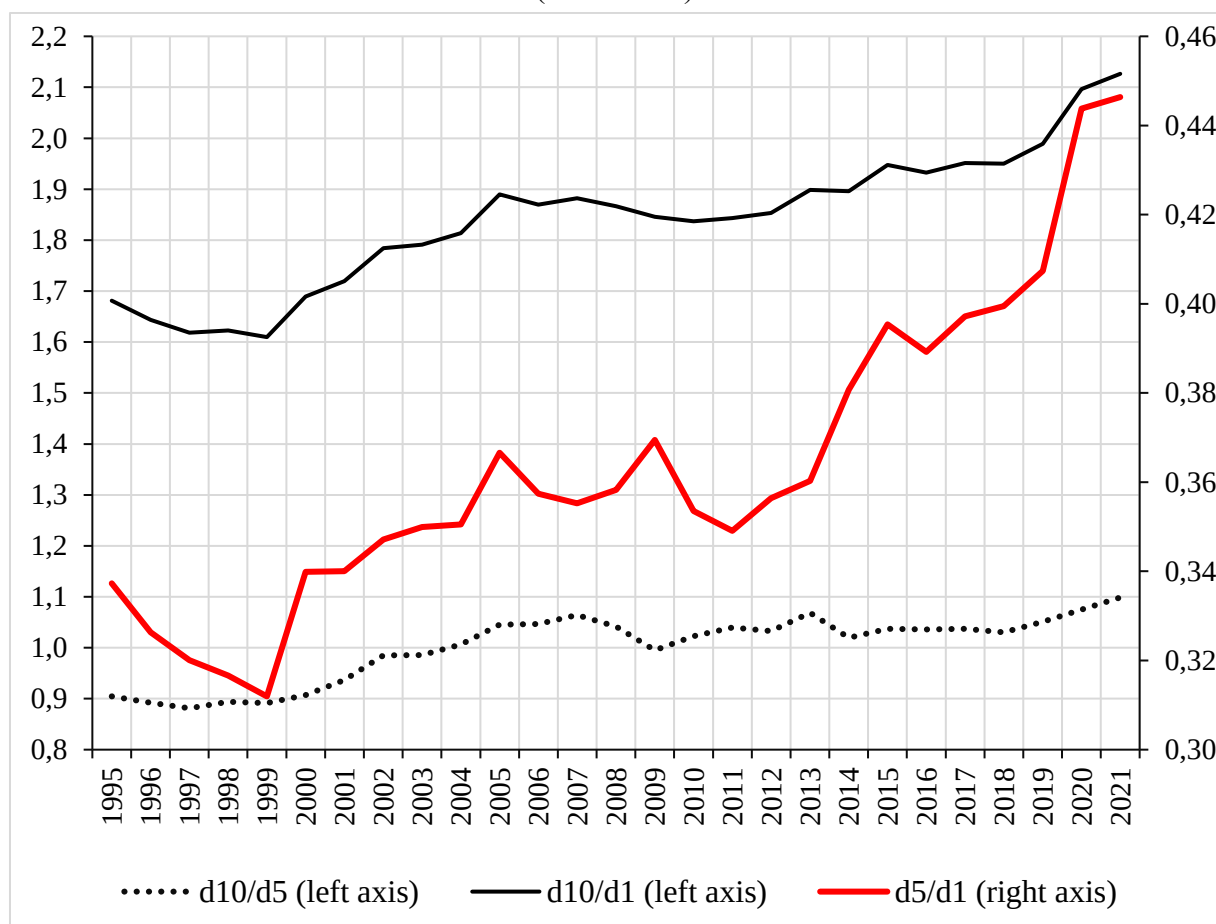


Sources: Socio-Economic Panel SOEPv39.

Calculations based on DIW Berlin (Grabka 2024).

Disposable household income inequality has, therefore, increased: the corresponding Gini coefficient rose circa 0.25 in 1995 to around 0.29 in 2005 and remained elevated ever since; the Gini coefficient was 0.296 in 2019 (Grabka 2022). **Figure 2.28** presents four (decile) ratios that measure inequality at different points of the disposable household income distribution. The top half of the income distribution has steadily become more unequal, as evidenced by the rise in the log ratio d10/d5 during 2000-2007. However, the inequality dynamics is mostly driven by the income stagnation at the bottom: both the log ratio d10/d1 and the log ratio d5/d1 increased considerably following the Hartz reforms (**Figure 2.28**).

Figure 2.28
Distribution of Real Disposable Household Income in Germany
(1995-2022)



Source: Socio-Economic Panel SOEPv38. Calculations by DIW Berlin (Grabka 2024).

Note: The decile ratios are calculated in natural logarithms.

The rise in earnings and disposable income inequality has thus been an integral part of Germany's strategy of work sharing. The creation of a large number of low-wage part-time atypical jobs has indeed helped to lower the unemployment rate (Carillo-Tudela *et al.* 2021) in an otherwise almost comatose economy, but at the cost of increasing inequality in wages and household incomes. This is not a 'jobs miracle', nor a role model which others ought to emulate.

Germany's macroeconomic policies did nothing to help revive growth and lower unemployment (Hein and Trüger 2005). Following Germany's membership of the EMU, the Bundesbank lost the capacity to use monetary policy to bolster the country's exchange rate and

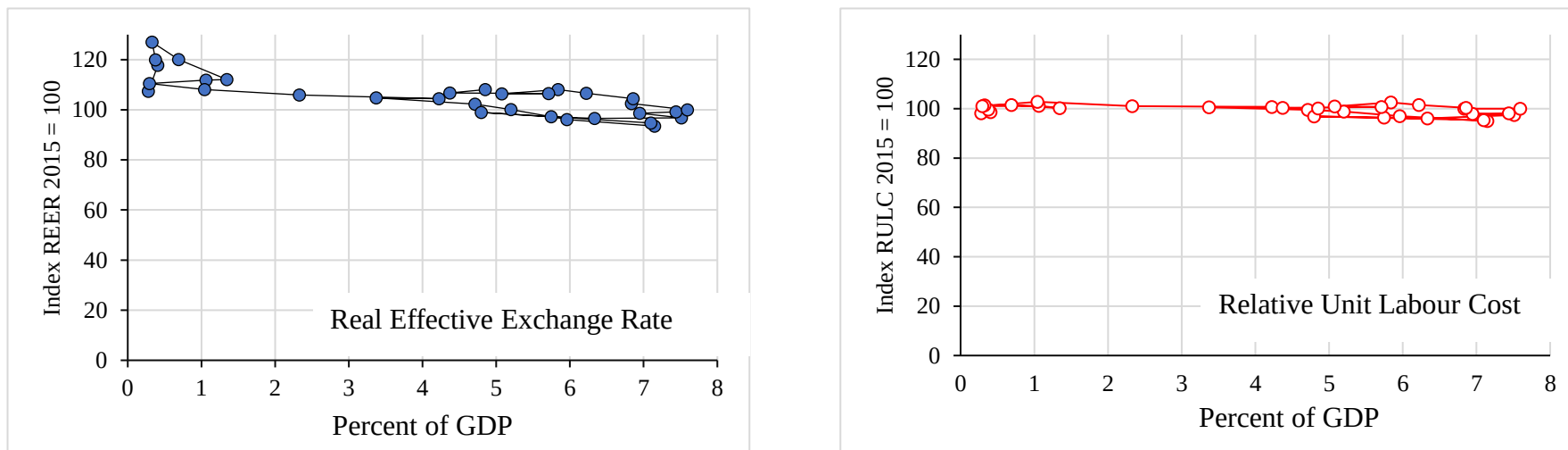
target the inflation rate.⁵¹ This has marked the end of the Bundesbank's strong currency regime. As is shown in **Figure 2.9**, Germany's REER declined by circa 25% during 1995-2011/12. In fact, since joining the common currency, Germany has had an undervalued currency relative to what it would have had without the Euro, especially against many other Eurozone countries, mostly because the trade deficits of the southern European economies in the EMU hold the Euro at a lower exchange rate than the Deutschmark would have been as a freestanding currency. Germany itself is also to blame, because it has refused to support the kind of monetary and fiscal stimulus that would raise overall Euro Area inflation which would have motivated the ECB to tighten monetary policy (Halevi 2019).

While others have emphasized the role played by the undervalued Euro exchange rate (Baccaro and Benassi 2017; Baccaro and Höpner 2022), the argument runs counter to the prima facie evidence. As can be seen from **Figure 2.29**, Germany's net exports (as a percentage of GDP) moved quite independently of movements in the real exchange rate. The REER depreciated by 15% during 1995-2000, as net exports rose from 0.3% to 1% of GDP; the REER then declined by 13.5% during 2000-2007, while net exports increased from 1% to 7% of GDP; the REER next appreciated by almost 12% during 2007-2017, while net exports continued to fluctuate around 7% of GDP.

Relative unit labour cost moved within an even narrower range than the REER, rising by 1.4% during 1995-2000, as net exports (as a percentage of GDP) increased; RULC declined by 7.6% during 2000-2007, while net exports rose from 1% to 7% of GDP; and RULC increased by almost 6% during 2007-2017, while net exports kept hovering around 7% of GDP.

⁵¹ After all, while the Bundesbank has a considerable influence on the ECB, it does not dictate monetary policy of the ECB.

Figure 2.29
The Evolution of the Real Exchange Rate and Net Exports in Germany: 1992-2023



Source: Authors' calculations based on AMECO data. *Notes:* The real effective exchange rate, relative to a competitor group, double export weights, has base-year 2015 = 100. Real unit labour costs, relative to competitor group, double export weights, has base-year 2015 = 100.

It is evident that Germany's exports and imports are driven by other factors than relative prices or costs, including the growth of foreign demand for German goods and the scale of offshoring and outsourcing by German corporations (which drives German imports of intermediate goods).

However, as before 1991, with wage-setting led by tradable sector unions (such as **IG Metall**), German wage growth continued to be oriented toward maintaining the real exchange rate. This strategy did not lead to faster export growth (compared to 1960-1990), but it did depress the growth of domestic consumption demand (**Table 2.6**) and lowered inflation, which in turn led to higher real interest rates in Germany than in the other Eurozone countries, with negative effects on Germany's investment and growth; as shown in **Figure 2.13**, the real interest rate in Germany was higher than that in the rest of the Eurozone during 1996-2008. Stalling domestic demand, relatively high real interest rates and overall deflationary conditions in Germany explain the persistence of high unemployment during 1996-2008.

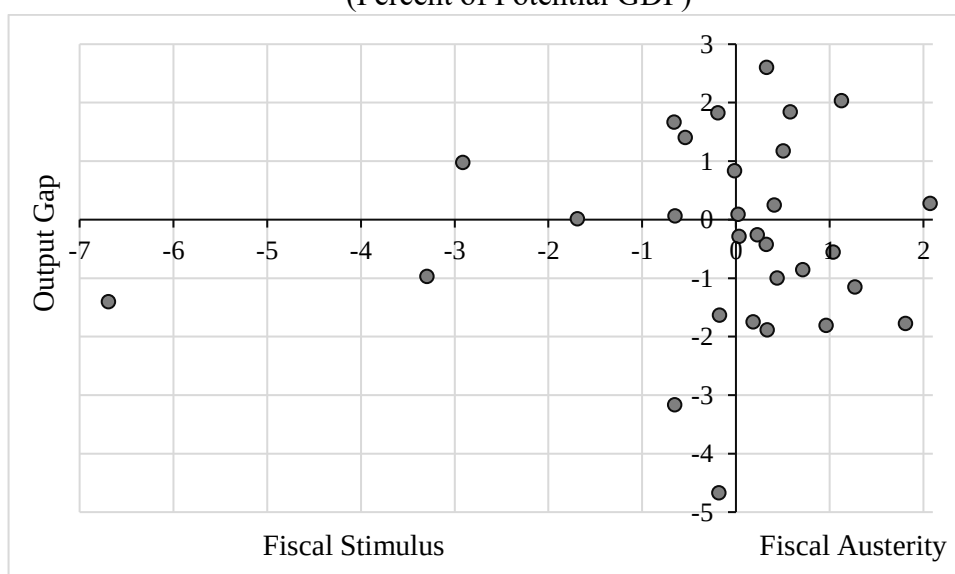
Germany's fiscal policy stance further deepened the deflationary conditions. Following reunification, and under Bundesbank pressure, the German government raised taxes and administered prices and cut spending during 1991-1995 in order to shrink the fiscal deficit and lower the public debt (in line with the requirements of the Maastricht Treaty). And following the loss of monetary policy sovereignty, German fiscal policy became even more conservative, more intensely mimicking the proverbial money-saving Swabian housewife; in 2009, the so-called debt brake (*Schuldenbremse*) was written into the German constitution, which forbids the German government from taking on additional debts and limits Germany's structural deficit to no more than 0.35% of annual GDP.

In line with Black Forest folklore, Germany's primary government balance during 1991-2023 was in the black in 22 years and the average annual budget deficit of the German government was exactly 0% of GDP. German fiscal policy was also often pro-cyclical. Consider **Figure 2.30**, in which we plot the discretionary fiscal policy stance (as measured by the change in the cyclically adjusted primary government balance) and the output gap in Germany during 1991-2023. In eleven (out of 32) years, the government budget surplus rose while the output gap was negative and in seven years the budget surplus declined, while the output gap was positive. Hence, in 18 out of 32 years Germany's fiscal policy position was pro-cyclical.

A major casualty of Germany's fiscal austerity has been (net) public fixed investment. As is clear from **Figure 2.31**, net public fixed investment (as a percentage of NDP) has been hovering around zero during the twenty-five-years period 1998-2023 — even when real public borrowing

rates were negative (as during 2015-2023). As a consequence, Germany's public capital stock net of depreciation is slowly crumbling. Bridges, highways, energy grids, telecommunication networks, railroads, and waterways are all in need of repair, hampering private sector fixed capital formation in Germany. On top of the infrastructure investment backlog, immigration and the green transformation have increased the investment needs. According to estimates by Dullien *et al.* (2024), Germany's public investment in (digital) infrastructure, housing and decarbonisation needs to be raised by €60 billion per year during 2024-2034, or 1.4% of Germany's GDP. The bizarre political commitment to a balanced budget has thus led to a hollowing out of the infrastructural backbone of Germany's economy. The ratio of public capital to GDP has been consistently falling. It makes no sense for a country with such vast surplus savings in its private sector⁵² not to use them at home, thereby generating both a stronger supply side and the demand that Germany and the Eurozone would need.

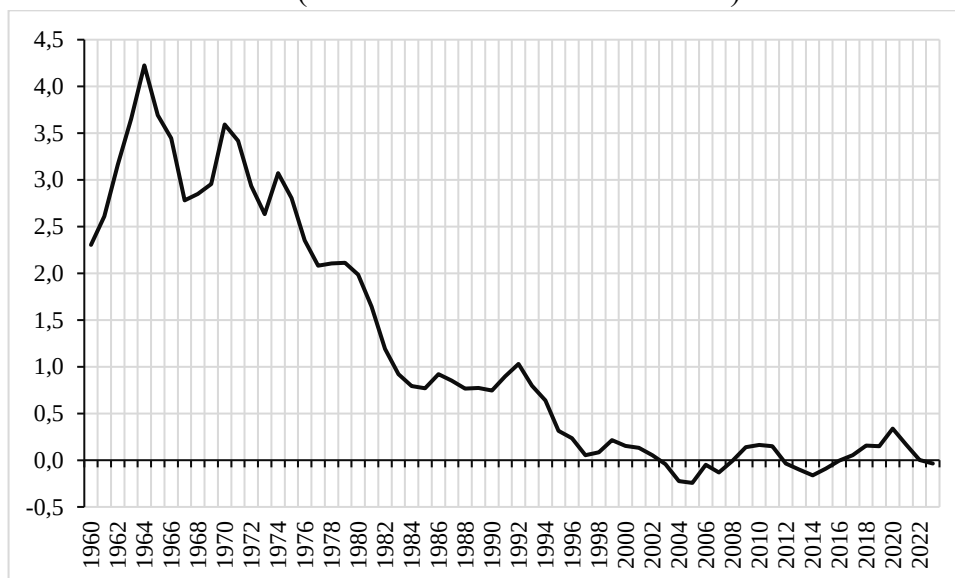
Figure 2.30
Germany: Discretionary Fiscal Policy (1991-2023)
(Percent of Potential GDP)



Sources: OECD Database. *Notes:* The fiscal impulse is the change in the cyclically adjusted primary balance from the previous year (as a percentage of potential output). Fiscal austerity (stimulus) is defined as a positive (negative) change in the fiscal balance. A negative output gap indicates that the economy is operating below potential.

⁵² The German private sector has been a net lender ever since the early 1980s.

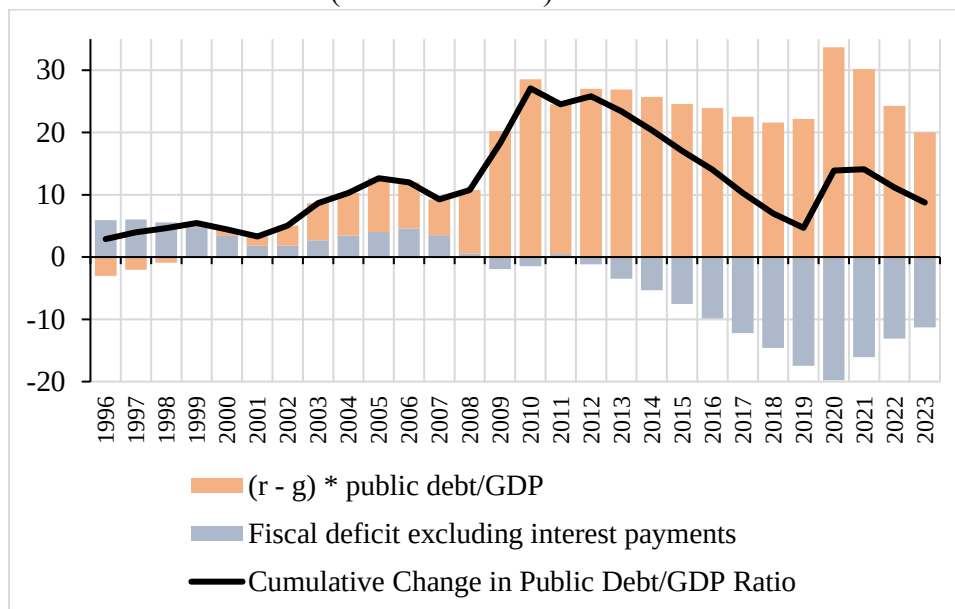
Figure 2.31
Germany: Net Public Fixed Investment (1960-2023)
(Percent of Net Domestic Product)



Source: AMECO database.

Germany's conservative fiscal policy stance helped to keep the country's public debt to GDP ratio relatively stable in the wake of the global financial crisis of 2008-10 and again in 2020, following the COVID19 recession (see **Figure 2.32**). Our decomposition of the cumulative change in the public debt to GDP ratio during 1996-2023 shows that Germany's fiscal surpluses lowered the debt-to-GDP ratio during 2012-2019. However, the decline in the public debt to GDP ratio was slowed down by the fact that the growth rate of Germany's nominal GDP was only slightly higher than the nominal interest rate (paid on public debt). Germany's conservative fiscal policies, in other words, have not been accompanied by a structural decline in the country's public debt-to-GDP ratio.

Figure 2.32
Cumulative Change in Germany's Public Debt to GDP Ratio (1996-2023)
(Percent of GDP)



Source: Authors' calculations based on AMECO database. *Notes:* The change in the public debt-to-GDP ratio Δd is decomposed using the debt dynamics equation that states: $\Delta d = fd + (r - g) \times d_{-1}$, where fd = the fiscal deficit excluding interest payments (as a percentage of GDP), r = the nominal interest rate on public debt, g = the growth rate of nominal GDP, and d_{-1} = the public debt-to-GDP ratio in the previous period. The figure presents cumulative changes (per cent of GDP) during 1996-2023.

The combination of work sharing by means of a low-wage sector, rising inequality and a consistently deflationary fiscal and monetary policy stance asphyxiated domestic demand (Table 2.6), even if Germany's unemployment rate declined after 2005, inflation remained low and business profitability recovered (Figure 2.16). Importantly, the higher profit share and the higher net returns on capital stock failed to revive domestic investment: the long-run decline in gross fixed investment (as a percentage of GDP) that had started in the 1970s, was only briefly interrupted by the reunification boom during the 1990s, but continued in the early 2000s (Figure 2.17). The average contribution of gross fixed capital formation to average annual real GDP growth during 1992-2023 was a mere 0.22 percentage, which was significantly below its contribution to economic growth of 0.68 percentage points during 1960-1991 (Table 2.6).

Table 2.6
Contributions to Average Annual Real GDP Growth:
Germany (1961-2023) (Percentages)

	Contribution of:				Real GDP growth
	Private Consumption	Public Consumption	Gross Fixed Capital Formation	Net exports	
1961-69	2.56	0.82	1.00	0.17	4.55
1970-79	2.26	0.83	0.57	-0.14	3.52
1980-91	1.26	0.24	0.53	0.51	2.54
1992-99	0.88	0.45	0.23	-0.07	1.46
2000-08	0.29	0.22	0.12	0.90	1.53
2009-23	0.46	0.40	0.27	-0.04	1.10

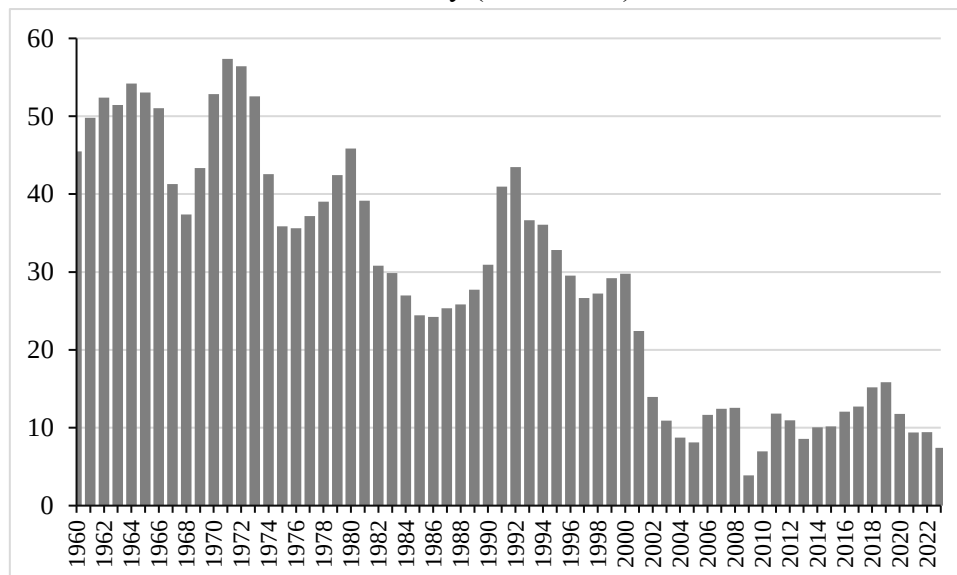
Source: Authors' calculations based on AMECO data.

The (growing) profits were not used for investment in Germany's domestic economy, as is shown in **Figure 2.33**. During 1961-1969, the ratio of net fixed capital formation to net operating surplus (net profits) was 48% on average per year. During the 1990s, this ratio declined to 34%. During 2000-08, net fixed capital formation was just 15% of net profits, and during 2009-2023, net fixed capital formation amounted to only one-tenth of the economy-wide net operating surplus. Higher profits and abundant internal finance did therefore not translate into high levels of corporate investment in the German economy. But German firms have been increasingly investing abroad.

Figure 2.34 presents evidence on net fixed capital formation by German firms and of FDI outflows by German firms, both as a percentage of net domestic product (NDP). It is clear that higher FDI partly has compensated for the strong decline in domestic investment. FDI by German firms rose from 0.6% of NDP in the 1970s to 3.5% of NDP during 2000-08 and 4.4% of NDP during 2009-2023. During this period, investment abroad is higher than domestic net fixed investment. The fundamental transformation in the German economy since the early 1990s is the movement away from an economy that is manufacturing things to an economy that is making money by reaping rents from manufacturing things abroad.

Figure 2.33

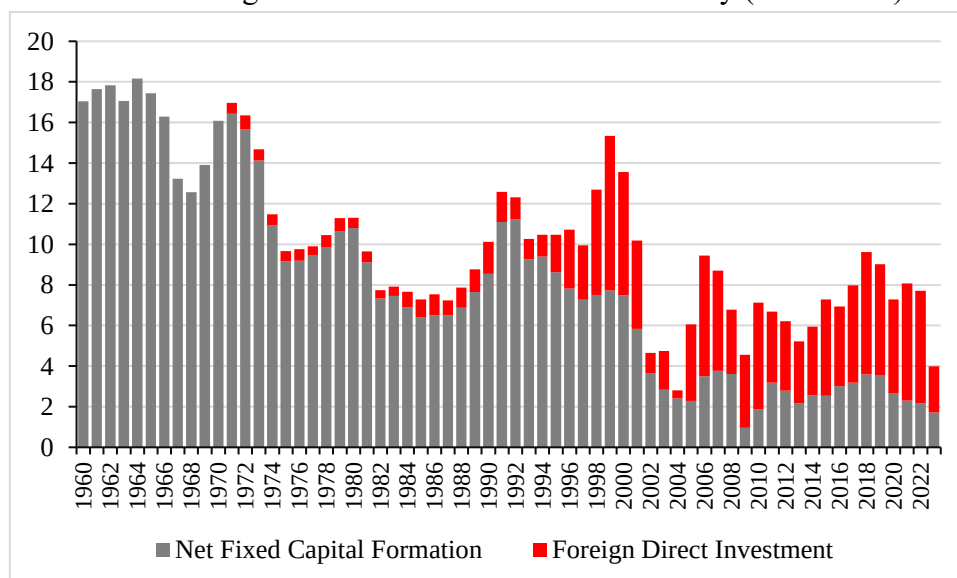
Net Fixed Capital Formation as a Percentage of Net Operating Surplus:
Germany (1960-2023)



Source: AMECO database. Note: Net public investment as a percentage of GDP has been close to zero during 1997-2023.

Figure 2.34

Net Fixed Capital Formation and Foreign Direct Investment
as a Percentage of Net Domestic Product: Germany (1960-2023)



Sources: AMECO database and World Bank, World Development Indicators.

The US and Europe are the most important sites for German FDI in manufacturing ([Bundesbank 2024](#)). But from the mid-1990s onwards, German corporations have been offshoring a substantial share of their production to Eastern European affiliates to exploit lower wages in the East. German firms have also invested on a large scale in China, particularly in the automotive and mechanical engineering industries.⁵³

German firms have thus used the retained profits, in part, for foreign direct investments. As is shown in **Figure 2.35**, Germany's FDI began to increase during the 1980s, rising from around 3.6% of gross domestic fixed capital formation during the early 1990s to more than 23% of domestic fixed investment in 2019. According to some observers (e.g., Marin 2006, Schröder 2020), Germany has morphed into a 'bazaar economy' that is supplying the world with a broad range of products but has a growing share of the value of its goods produced in its East European hinterland or in China. We already observed that the import intensity of German (manufacturing) exports is around 40% (**Table 2.2**).

Offshoring may not be beneficial for German workers, but is certainly a boon for the shareholding class, because German firms have been massively repatriating profits from abroad. A first indication of the scale of profit repatriation over time is given in **Figure 2.36**, which plots net primary income from abroad by German firms and workers as a percentage of the country's GDP. It can be seen that net primary income repatriated from abroad was relatively small during 1960-1990, generally below 1% of Germany's GDP. Net primary income from

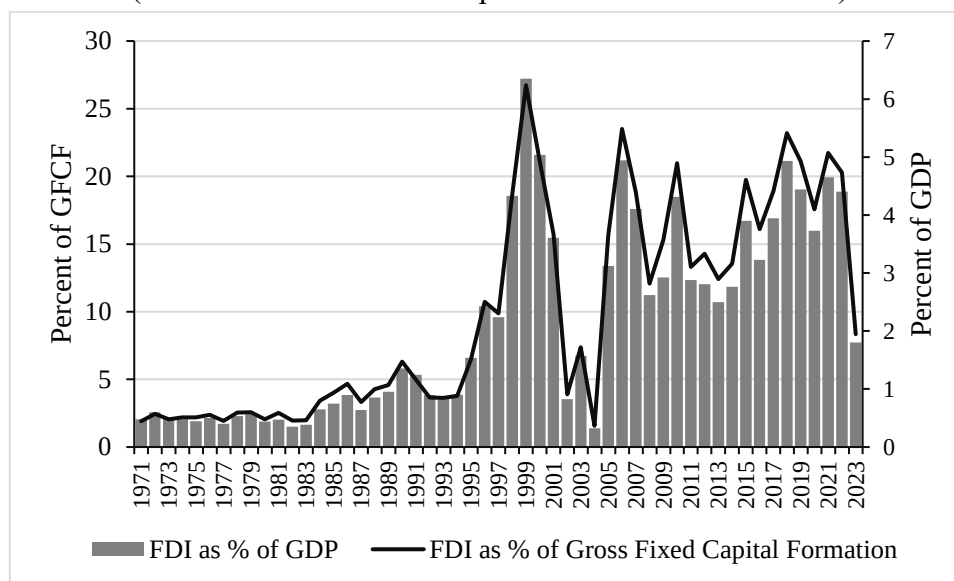
⁵³ The stock of Germany's FDI is distributed across major countries of destination as follows:

	2013	2018	2022
Western Europe	47%	47%	54%
Eastern Europe	9%	10%	9%
U.K.	12%	9%	6%
US	15%	18%	18%
China	4%	5%	5%
Other countries	13%	11%	9%
Total	100%	100%	100%

Source: OECD data on FDI by counterpart area and by economic activity.

abroad turned negative between 1997-2003, but then it began to increase very considerably, reaching a level of 4% of GDP in 2023. National accounts data for Germany show that 90% of net primary income from abroad consists of property income (which includes corporate profits repatriated from abroad).

Figure 2.35
Germany's (Outward) Foreign Direct Investment (1971-2023)
(Percent of Gross Fixed Capital Formation and of GDP)

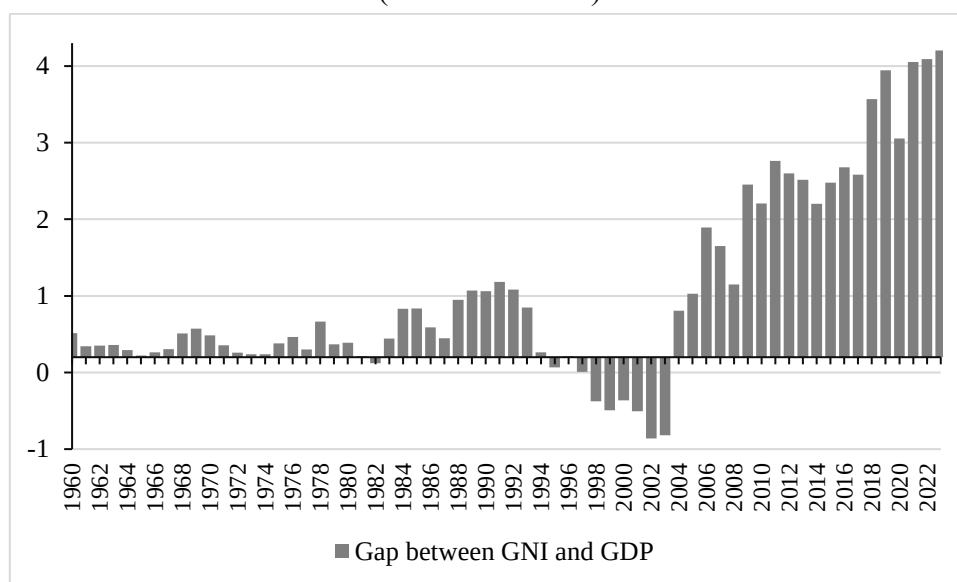


Sources: World Bank data on FDI and AMECO Database.

In fact, according to recent data on profit repatriation collected by Parnreiter *et al.* (2024b), the annual gross profit inflow into Germany is \$62.6 billion during 2005-2020. In cumulative terms (over the period 2005-20) and converted to Euros, this amounts to a sum of circa €1 trillion of repatriated profits; we note that cumulative net primary income from abroad⁵⁴ during the same period also amounted to around € trillion. It is therefore reasonable to assume that the inflow of net primary income ended up in the hands of firms and shareholders. As documented by Parnreiter *et al.* (2024a), Germany's automotive industry is heavily reliant on the profits that are made abroad thanks to local markets and cheap labour.

⁵⁴ Net primary income from abroad consists of net profit flows and net labour income flows (remittances). Bundesbank data show that Germany's net primary income from abroad consists almost completely of net profit received from the rest of the world.

Figure 2.36
Difference between Gross National Income and Gross Domestic Product
(1960-2023)
(Percent of GDP)



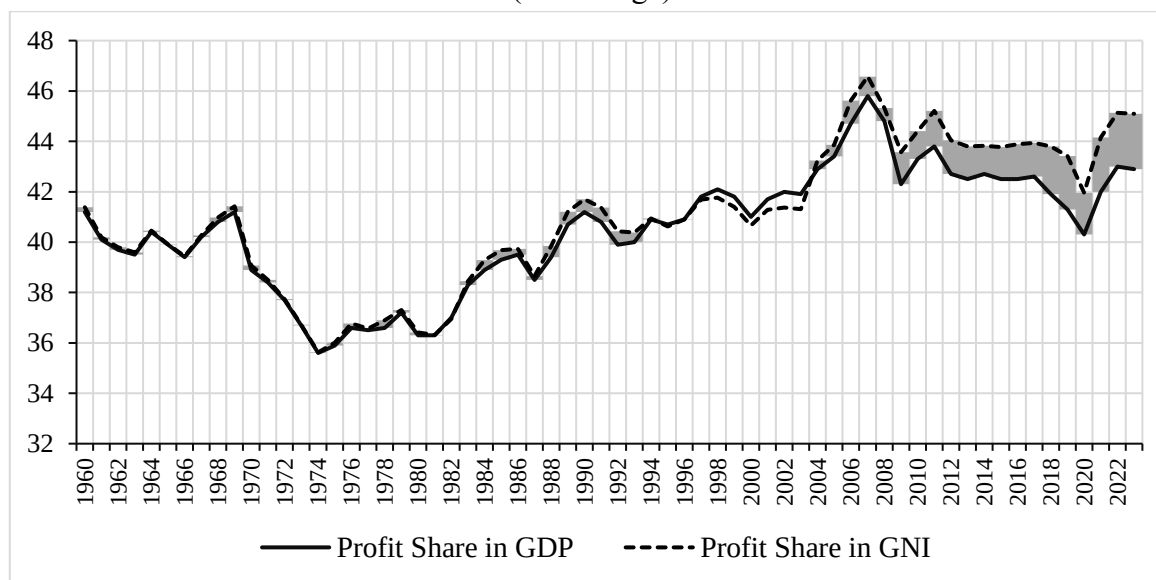
Source: Calculated based on AMECO Database.

This has obvious implications for the distribution of income. In **Figure 2.37**, we calculate the profit share in GDP versus the profit share in Gross National Income (GNI). It is evident that the profit share has increased more significantly, when we take the repatriated profits into account. This surge in corporate profits led to higher corporate saving, which when not reinvested deflates aggregate demand. As shown in **Figure 2.12**, German corporations have become net lenders (Behringer and van Treeck 2019) — saving more than they have been investing in Germany itself.

The outcome is not a model of growth, but a serious pathology: German exporting companies have been doing extremely well, the country has a persistent and huge current account surplus and is earning massive profits generated by activities abroad; yet, economic growth is in long-term decline, Germany's public infrastructure is crumbling after decades of public underinvestment, the unemployment rate is low mainly because large sections of the working-age population have to work in atypical employment (often mini-jobs), aggregate wage growth is actively suppressed below labour productivity growth to protect the corporate profit share,

earnings and income inequality has been rising, and all the while, business investment in the domestic economy is depressed, while FDI exceeds net domestic fixed investment.

Figure 2.37
The Profit Share in GDP and in Gross National Income (1960-2023)
(Percentage)



Source: AMECO Database.

The higher profits, in combination with lower fixed investment ambitions, have reduced the dependence of German oligopolistic corporations on German banks. As shown in **Figure 2.12**, from being net borrowers before the mid-1990s, German non-financial corporations turned into net lenders, as their abundant retained savings began to exceed their domestic investments by a large margin. German firms have been accumulating substantial savings. Tax changes in the 1980s encouraged firms to rely more on internal financing (Behringer and van Treeck 2019) and the stricter equity requirements of Basel I and II may have led to an even stronger desire of *Mittelstand* companies to make themselves independent from the commercial banks (Braun and Deeg 2020). The German corporate sector continued to rely mostly on self-financing, which on average accounted for 75% of investment funding since 1995, and the export-oriented manufacturing sector slightly lowered its reliance on bank lending between 1993 and 2018 (Braun and Deeg 2020). As a result of the higher profits and lower investment ambitions, corporate borrowing from the banking sector as a whole did not rise as a percentage of GDP since 1991 (Braun and Deeg 2020). In the process, German firms have become less reliant and less dependent on the patient capital provided by banks.

German banks have been drifting out of the institutional bloc that earlier carried the Bundesbank model of growth. The gradual decline in business lending has pushed German banks to search for loan demand elsewhere; as Braun and Deeg (2020), German banks significantly stepped up their lending to (other) banks at home and abroad and increased their lending to foreign firms and households, mostly located in the Eurozone. The increase in foreign lending by German banks has facilitated the growth of Germany's net exports, in mercantilist fashion. Between 2000 and 2015, Germany's net financial assets – its foreign assets minus its foreign liabilities – grew from zero to €3.2 trillion, or 76% of GDP in the second quarter of 2024 ([Bundesbank 2024b](#)). By internationalising their lending activities, *i.e.*, by turning away from German corporations, German banks managed to keep their businesses afloat.

The conclusion must be that Germany's financial-industrial complex has weakened in recent decades; according to Braun and Deeg (2020), Germany now has “strong firms and weak banks”. If it is indeed the case that commercial banks are no longer a dominant stakeholder in the manufacturing sector, then other insiders — management and large shareholders such as BlackRock and Vanguard — have arguably gained greater autonomy and power over Germany's industrial firms and their strategic direction. As a result, the traditional long-term and technological orientation of German manufacturing firms has been replaced by a more short-term shareholder-value-oriented focus, which has motivated firms to become uprooted, offshoring and outsourcing their production activities to low-wage countries in the quest for higher returns. This way, Germany's firms have remained competitive, but German workers lost ground. Or as Hans-Werner Sinn (2006, p. 1164) sums it up:

“Firms maintain their competitiveness for the very reason that they get rid of their German workers, replacing them by Romanians, Bulgarians, Hungarians, Chinese or robots. The ship stays afloat because it has thrown part of its crew overboard. This may be good for the owner of the ship and the rest of the crew that remains on board, but not for that part that, downgraded as ballast, sank to the bottom of the sea.”

2.5. Has Germany's Growth Model Reached the End of the Road?

The German economy appears to pose a perennial puzzle. Germany's much admired post-WWII *Wirtschaftswunder* morphed rather seamlessly into the 'sick man of Europe', suffering from 'Euro sclerosis' in the late 1980s and 1990s (Giersch, Paqué and Schmieding 1992; Siebert 1997), if only to re-emerge as an 'economic superstar' (Dustmann *et al.* 2014) following its success in bringing down the unemployment rate after its peak in 2005 (Burda and Hunt 2011). *The Economist* famously depicted Germany as the 'sick man of Europe' in 1999 (*The Economist* 1999), but labelled it ten years later 'Powerhouse Deutschland' (*The Economist* 2010). Germany's economic prowess at that time was widely attributed to its strong export growth, which in turn was argued to be based on strong labour cost competitiveness, driven by excessive wage restraint (Baccaro and Benassi 2017; Baccaro and Höpner 2022) as well as on the country's coordinated system of industrial relations and close long-term links between industrial firms and (patient) banks (Hall and Soskice 2001; Braun and Deeg 2020). But this 'economic powerhouse' now suddenly succumbed to disease, which is turning it into the 'sick man of Europe' once again: Germany has been struggling, recording no growth during the best part of 2021-2024, with export growth falling, as demand from China fell, growing protectionism is hurting global trade, energy prices increased (following the war in Ukraine) and the German automotive industry was slow to adapt to the growing demand for electric vehicles (Bofinger 2024; Wolf 2024).

We have offered a different explanation which is centred on the monetary policy stance of the Bundesbank and fiscal policy by the German state — in our view, most other analyses do not give sufficient weight to macroeconomic policy while diagnosing the state of the German economy and identifying the nature of the country's growth model. In our analysis, Germany's macro policy approach worked remarkably well during the period 1950-c.1980, but began to falter already in the 1980s and broke down in the 1990s under the weight of German reunification, financial globalisation, European monetary integration and the rise of Chinese exporters in global markets of more sophisticated industrial goods. In short, Germany was an 'economic superstar' during 1950-c. 1980, but has been a 'sick man' ever after, as domestic demand growth was suffocated by deflationary macro policies and wage growth restraint and the economy became export-dependent in a deeply pathological sense (which is by no means the same as being export-led).

Germany has been a manufacturing-export-oriented economy ever since 1949, because its home market was and is too small for its often highly specialised oligopolistic industrial firms. During the post-WWII decades 1950-1975, German firms were able to develop their engineering prowess into (globally) leading manufacturing producers within an economy based on three structural pillars. The first pillar consisted of the relentlessly tight monetary policy by the Bundesbank, which led to a structurally strong Deutschmark that turned Germany into a high-price exporter. Bundesbank policy thus forced German industrial exporters to compete on *non-price factors*, including quality, embodied technology, and service, rather than on price or unit labour cost. The drive to successfully compete on non-price factors became hardwired into the minds and corporate strategies of the country's manufacturing exporters. It is important to note that, in this period, the potential for offshoring and outsourcing to low-wage countries by Germany's industrial firms was limited, because of geopolitical reasons (neither the Soviet bloc nor China were open to FDI) and controls of cross-border financial flows (Halevi 2019).

The second pillar concerns Germany's 'industrial-financial complex' (Halevi 1995). Germany's banks helped industrial firms to build non-price competitive advantage by funding their activities and investments using long-term loans (a.k.a. 'patient capital'). The macroeconomic prerequisite for patient capital is a low and stable rate of inflation, which was the top priority of Bundesbank policies. Fiscal policy, in effect, had to be conservative, and supportive of monetary policy, in order not to upset the price stability that underpinned the industrial-financial complex.

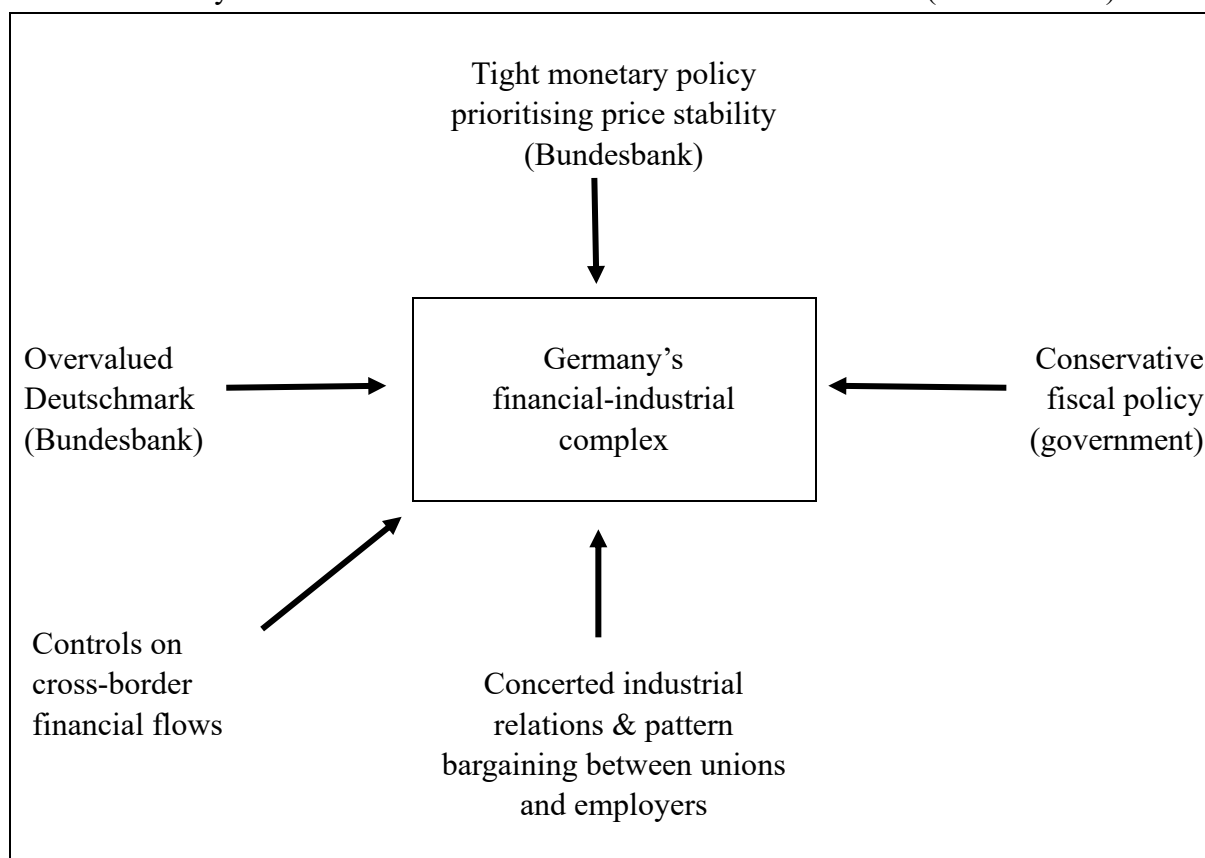
The third and *essential* final pillar of Germany's post-WWII growth model consisted of its concerted industrial relations system (in manufacturing) and its concomitant system of 'pattern bargaining', which contributed to stable and moderate aggregate (real) wage growth, with industry-level real wages growing in line with economy-wide labour productivity growth (Hall and Soskice 2001). This system of 'pattern bargaining' redistributed income from workers in more productive manufacturing sectors and companies to workers in less productive ones — while allowing the manufacturing profit share to be relatively high — and contributed to relatively strong growth of domestic consumption and business investment.

Figure 2.38 presents a visualisation of this 'Bundesbank-led' model of economic growth in Germany's social market economy in which we highlight the systemic, growth-enhancing complementarities between the various macroeconomic and labour market policies that were in operation in Germany in this time-period. This growth model worked remarkably well during

the period 1950-1980, but (as we explained above) it broke down during the 1990s, as Germany's economy suffered from a secular decline in domestic demand growth, weak economic growth, and unemployment was reduced by sharing low-wage part-time jobs. Germany became overly dependent on manufacturing export growth and repatriated profits earned abroad. Germany's economy is now in serious trouble, as German firms began to lose global market share, predominantly because of the growing importance of China and other East Asian exporting countries.

Figure 2.38

Germany's Bundesbank-Led Growth Model: Balanced Growth (1950-c. 1980)



Source: Constructed by the authors. *Notes:* Germany's 'social market' order featured a strong central bank, protected from political interference, that has the power to stabilize the currency and target inflation. Government balances tax revenue against public expenditure, while also providing a social safety net to protect the disadvantage. The industrial relations system and wage bargaining are the preserve of employers and trade unions (with minimal state interference).

The structural pillars on which the successful Bundesbank-led model rested, have collapsed. Following European monetary integration, the Bundesbank lost the capacity to set the interest

rate to influence the country's exchange rate and target inflation (even if tight monetary policy became the norm across the Euro Area). During 2001-2008, the one-size-fits-all interest rate policy by the ECB resulted in a real interest rate that was too high for low-inflation Germany, hurting business investment. Germany's REER fell during 1995-2011/12, marking the end of the Bundesbank's strong currency regime. Germany now has a structurally undervalued currency, but Germany's exporting firms have continued to lose global market share. Fiscal policy became more structurally conservative, draining domestic demand, especially after the 'debt brake' was added to the German constitution in 2009. Persistent underinvestment in public infrastructure (broadly defined) has led to the crumbling of public capital stock (embodied in railways, roads, bridges, public buildings, digital infrastructure, etc.), that is hurting business activities. Monetary and fiscal policies no longer operate as 'enabling constraints' on corporate decision-making and on Germany's industrial relations as before, but have become 'debilitating constraints', suffocating domestic demand and stifling economic growth.

Second, Germany's corporations freed themselves from banks (Braun and Deeg 2020), by generating growing operating surpluses and turning into net lenders (instead of net borrowers). Business investment in the domestic economy and in R&D has been depressed, while operating surpluses have been used for FDI, offshoring and outsourcing production activities to low-wage countries. Repatriated profits have surged, benefiting corporate shareholders of the companies concerned. This way, Germany's firms have remained competitive, but German workers lost ground. The German economy features a core sector, made up of industrial export-oriented oligopolistic corporations that offer around 20% of all working hours in the economy in a year and that profit from the earnings made abroad, and a much larger peripheral sector, which includes low-wage services activities (Storm and Naastepad 2015).

Third, labour market reforms (especially the Hartz reforms of 2003-2005) codified the dualization of Germany's labour market, replacing the earlier system of pattern bargaining by decentralised bargaining and facilitating the growth of low-wage jobs (especially in services). Disparity in wages between industries and between occupations increased. In combination with the 'Black Zero' fiscal policy stance, stalling real wage growth led to a secular decline in domestic demand growth.

Germany's bazaar economy is not a model, but a pathology: the self-imposed combination of deflationary monetary and fiscal policies, wage growth restraint and the promotion of a massive low-wage sector is toxic, suffocating domestic demand and hardwiring the (dynamic) core

versus (stagnating) periphery dualism into Germany's economic structure. During the period 1950-1980, Bundesbank restrictive monetary policy did work as a *de facto* industrial policy, forcing German manufacturers to compete on non-price factors, while the system of pattern bargaining succeeded in maintaining a balance between domestic demand growth and export growth, effectively offsetting a relatively conservative fiscal policy stance. But the logic of this growth model broke down in the 1980s and 1990s — in particular, because the Bundesbank-led system could not cope with the rise in unemployment, because of ongoing technological progress in the core manufacturing sector and due to German reunification. Labour market deregulation in the 1990s and the Hartz reforms of 2003-2005 lowered the official unemployment rate, but at the cost of creating a vast low-wage segment of flexible (mini) jobs, rising earnings and job disparities, and aggregate real wage stagnation. The consequent asphyxiation of domestic demand made the economy pathologically dependent on foreign demand — the earlier balance between domestic and export demand is gone. German firms are mainly investing abroad, earning substantial profits that are not reinvested within the German economy. Germany's financial-industrial complex has broken down, because firms do no longer rely on banks for 'patient financing', but instead use retained profits (which is an even more patient form of funding).

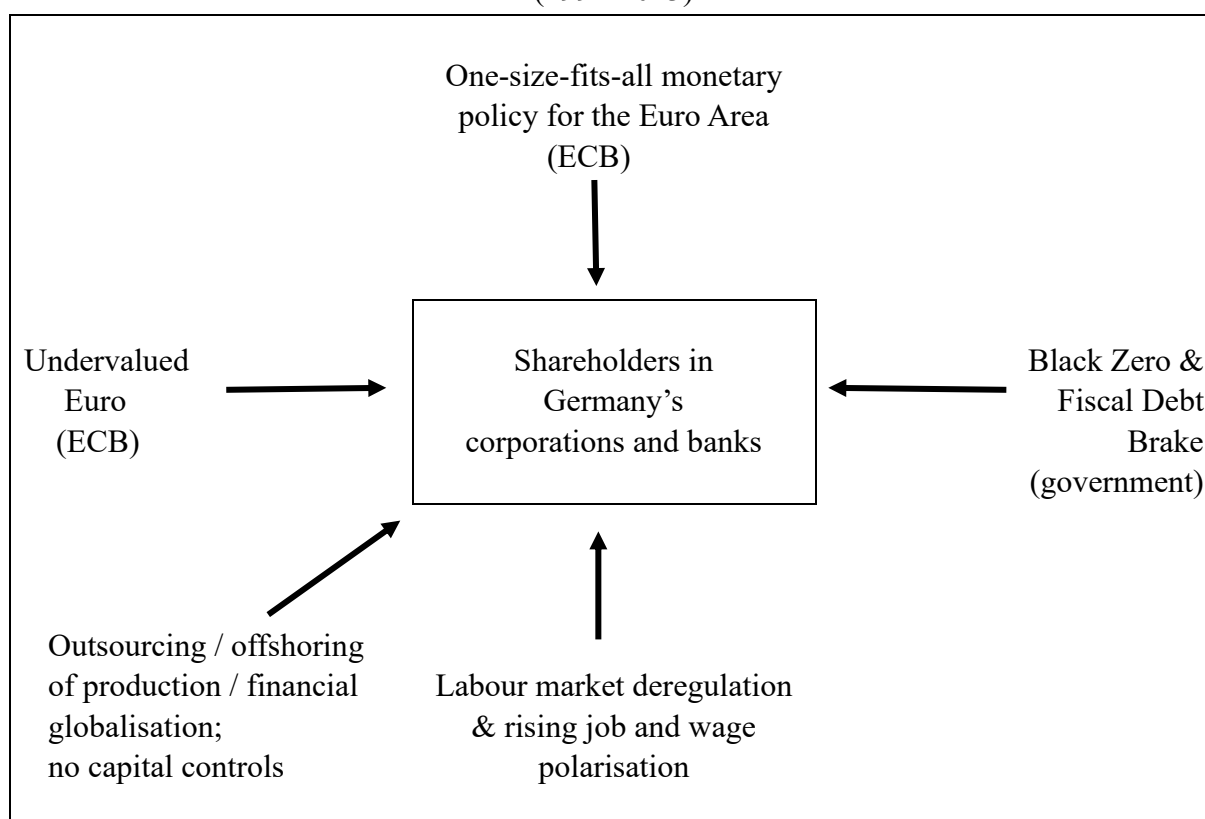
This structural change in the German economy has important implications for macroeconomic policy: since the demand of German exporting corporations for patient bank credit has diminished, there is no longer a macroeconomic justification for the relentlessly tight monetary policy by the Bundesbank. Put differently, the orientation of Bundesbank monetary policy should change and become less restrictive — allowing for more space for (nominal) wage and income growth. Similarly, fiscal policy has to be fundamentally reformed: now fiscal conservatism has become a major drain on domestic demand and economic growth. The constitutional debt brake has to go in order to allow the German state to actively provide public funding to stimulate domestic demand, rebuild and expand critical public infrastructure (Dullien *et al.* 2024) and support the spread of new technologies (a view shared by Bofinger (2023)).⁵⁵

⁵⁵ Bundesbank president Joachim Nagel recently urged Berlin to relax rules to address defence and infrastructure shortfalls. More fiscal space to address structural threats — such as boosting defence spending and modernising the country's infrastructure — would mark a “very smart approach”, Nagel told the *Financial Times*, December 4, 2024 ([Storbeck and Jenkins 2024](#)).

Germany is not just the sick man of Europe, but also Europe’s ‘dumb man’, because the toxic policy mix is based on a flawed macroeconomic understanding of Germany’s economy (Bofinger 2024). One has to ask the question: why it is not possible to shape a good economic policy for Germany enjoying a consensus among the democratic parties?

Figure 2.39

Germany’s FDI-led Bazaar Economy: Stagnation & Pathological Export-Dependence
(1991-2023)



Source: Constructed by the authors. *Notes:* In this economic order, the (financial) interests of shareholders are dominant, at the cost of the interests of both workers and (industrial) engineers; shareholder interests are helped by a strong central bank, protected from political interference, and by structural fiscal austerity by the government. The government is actively deregulating the labour market and the industrial relations system in order to suppress wage growth and protect the profit share. To benefit shareholder interests, large parts of production are offshored (to lower-wage countries) and profits are siphoned off through dividend pay-outs and stock repurchases.

Postscript to Part One

Our analysis of the macroeconomic constraints within which the German automotive industry has to navigate the digital and EV transitions, will be followed by an investigation of the strengths and weaknesses of the German car industry and the impacts of the EV transition in this sector on workers, industrial relations and firms. We pay detailed attention to the globalisation strategies of German automotive corporations, their offshoring to Eastern Europe and their strong reliance on and involvement in the Chinese market. This will be done in **Part Two** of our analysis, which will be published as a separate Working Paper and which will focus on the financialization of the automotive corporations (the rise of shareholder power at the cost of union influence) and the tradition of negotiated change in the automotive industry, that is embedded in the larger ‘German model’ of industrial relations. We examine to what extent the historical and institutional strength of Germany’s industrial relations system can be made to work *in support of* the transition to EVs, and to what degree the transition may be hindered by the financialization of Germany’s car manufacturers. This will help us to assess the employment impacts of the EV transition on the German welfare system in the context of globalization (the new China Shock), digitalization, and a green transition. In the conclusions, we contextualise the EV transition within the larger macroeconomic context and focus on the role of the German government and the Bundesbank in backing the transition to EVs and funding supportive industrial and social/welfare policies.

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