HWR Research Competence Centre
CHALLENGES AND RESILIENCE OF GLOBAL SUPPLY AND VALUE CHAINS

Hochschule für Wirtschaft und Recht Berlin
Berlin School of Economics and Law

Institute for International Political Economy at the Berlin School of Economics and Law (IPE)

Eurozone governance and the German demand and growth regime, 1999-2024

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1. Introduction

- **Eurozone economic governance system: influenced by New Consensus Macroeconomics (NCM)**
  - Highly independent European Central Bank (ECB): inflation targeting policies and price stability as top goal
  - Fiscal policy by member states: coordinated by Stability and Growth pact (SGP); reinforcing Maastricht Treaty's: deficit-GDP ratio of 3% and debt-GDP ratio of 60%; requiring close to zero structural government budget balance to support inflation stabilization ➔ No role for active government demand management
  - no wage and income policies
  - Focus on supply side measures to improve long-run employment and growth: labor and product market deregulation reducing wage and price setting power of workers/trade unions and firms and hence the NAIRU

- **Multiple crises revealed severe problems of the Eurozone economic policy institutions**
  - No mechanism preventing rising current account (CA) imbalances and divergences among member states
  - In Great Recession and Eurozone crisis, ECB interest policies insufficient to stabilize aggregate demand and economic activity
  - Role of the ECB as a 'lender of last resort' unclear at the beginning of the Eurozone crisis

1. Introduction

- **Financial stabilization and fiscal constraints since the Eurozone crisis deepened problems between the Great Recession and the Covid-19 crisis**
  - Comparatively slow growth, externalization of internal current account imbalances and large regional surplus
  - Relaxation of SGP with the Covid-19 crisis (e.g. Recovery and Resilience Facility), but no fundamental changes in the role of fiscal policies in the Eurozone policy mix with the last revision of EU fiscal rules

- **Germany within Eurozone governance system: biggest economy, specific and changing role over time**
  - Until Great Recession: low growth, high unemployment, low inflation and rising CA surpluses. Main contributor to internal Eurozone CA imbalances ➔ Germany as the ‘sick man of Europe ’
  - After Great Recession and Eurozone crisis: higher growth and more stable development ➔ Germany as a role model for other Eurozone countries
  - After the recovery from the Covid-19 crisis and the rise in inflation, accelerated by the Russian war on Ukraine, Germany again seems to have fallen behind the rest of the Eurozone ➔ ‘sick man of Europe’ again?

Outline

1. Introduction
2. Demand and growth regimes in Germany, 1999-2024

2.1 National income and financial accounting decomposition

2.2 Autonomous demand-led growth decomposition

3. Exports, international trade and the productive structure
4. Macroeconomic policy regime and the Eurozone governance system
5. Conclusions

2.1 National income and financial accounting decomposition

- **First level of analysis: main sources of demand and growth (C, G, I, NX) and the way it is financed (private, public, external balances)** (Hein, 2011/2012)
  - Advantage: based on accounting conventions and thus not limited to any particular theory

$$g_t = \frac{\Delta Y_t}{Y_{t-1}} = \frac{\Delta C_t}{Y_{t-1}} + \frac{\Delta G_t}{Y_{t-1}} + \frac{\Delta I_t}{Y_{t-1}} + \frac{\Delta X_t}{Y_{t-1}} - \frac{\Delta M_t}{Y_{t-1}} = \frac{\Delta C_t}{Y_{t-1}} + \frac{\Delta G_t}{Y_{t-1}} + \frac{\Delta I_t}{Y_{t-1}} + \frac{\Delta NX_t}{Y_{t-1}} \quad (1)$$

$$FB_P + FB_G + FB_E = (S - I) + (T - G) + (M - X + FI^{net}) = 0 \quad (2)$$

  - Insights on demand dynamics and imbalances
  - Four demand and growth regimes are identified in the literature:
    1) export-led mercantilist (ELM)
    2) weakly export-led (WEL)
    3) domestic demand-led (DDL)
    4) debt-led private demand boom (DLPD)

2.1 National income and financial accounting decomposition

Table 2. Demand and growth regimes in Germany. Annual averages for the periods 1999-2009, 2010-2020 and 2021-2024.

	1999-2009	2010-2020	2021-2024
Real GDP growth, percent	0.87	1.44	1.20
Growth contributions by main demand aggregates, percentage points (1)			
Domestic demand, including changes in inventories	0.46	1.31	1.20
Private consumption	0.37	0.41	0.68
Public consumption	0.25	0.41	0.25
Investment	-0.01	0.45	-0.09
Inventories	-0.15	0.03	0.36
Net exports of goods and services	0.37	0.12	-0.03
Exports	1.50	1.47	1.14
Imports	-1.12	-1.34	-1.17
Balance of goods and services as share of nominal GDP, percent	4.00	6.23	3.92
Sectoral financial balances as share of nominal GDP, percent			
Private sector	5.25	7.50	8.40
Private households	5.15	5.57	6.39
Corporations	0.10	1.94	2.01
Public sector	-2.29	-0.19	-2.53
External sector	-2.96	-7.32	-5.87
Demand and growth regime (2)	ELM	ELM	WEL

Source: European Commission (2024), authors' calculations and presentation.

Exports

- Most dynamic component of GDP during the entire period
- Growing at a faster pace than other components of aggregate demand
- Key contributor to German economic growth

2.2 Autonomous demand-led growth decomposition

- **Second level of analysis: additional information on the dynamics of growth sources, better understanding of the drivers behind regimes evolution**
  - Clear theoretical basis: Sraffian supermultiplier (SSM) framework. Long-run economic growth driven by non-capacity creating autonomous demand, not financed or induced by current income and that does not add to the productive capacity of the economy (Serrano, 1995)

$$Y = \frac{CC + G + I_G + I_H + X}{1 - c - h + m} = \frac{Z}{1 - c - h + m} = \alpha Z \qquad (3)$$

$$g_t = \alpha_t \left[\frac{CC_{t-1}}{Y_{t-1}}\right] g_{CC,t} + \alpha_t \left[\frac{G_{t-1}}{Y_{t-1}}\right] g_{G,t} + \alpha_t \left[\frac{I_{G,t-1}}{Y_{t-1}}\right] g_{I_{G,t}} + \alpha_t \left[\frac{I_{H,t-1}}{Y_{t-1}}\right] g_{I_{H,t}} + \alpha_t \left[\frac{X_{t-1}}{Y_{t-1}}\right] g_{X,t}$$
$$+\alpha_t \left[\frac{C_{H,t-1}}{Y_{t-1}}\right] g_{c,t} + \alpha_t \left[\frac{I_{C,t-1}}{Y_{t-1}}\right] g_{h,t} - \alpha_t \left[\frac{M_{t-1}}{Y_{t-1}}\right] g_{m,t} + \alpha_t \left[\frac{E_{t-1}}{Y_{t-1}}\right] g_{E,t} \qquad (4)$$

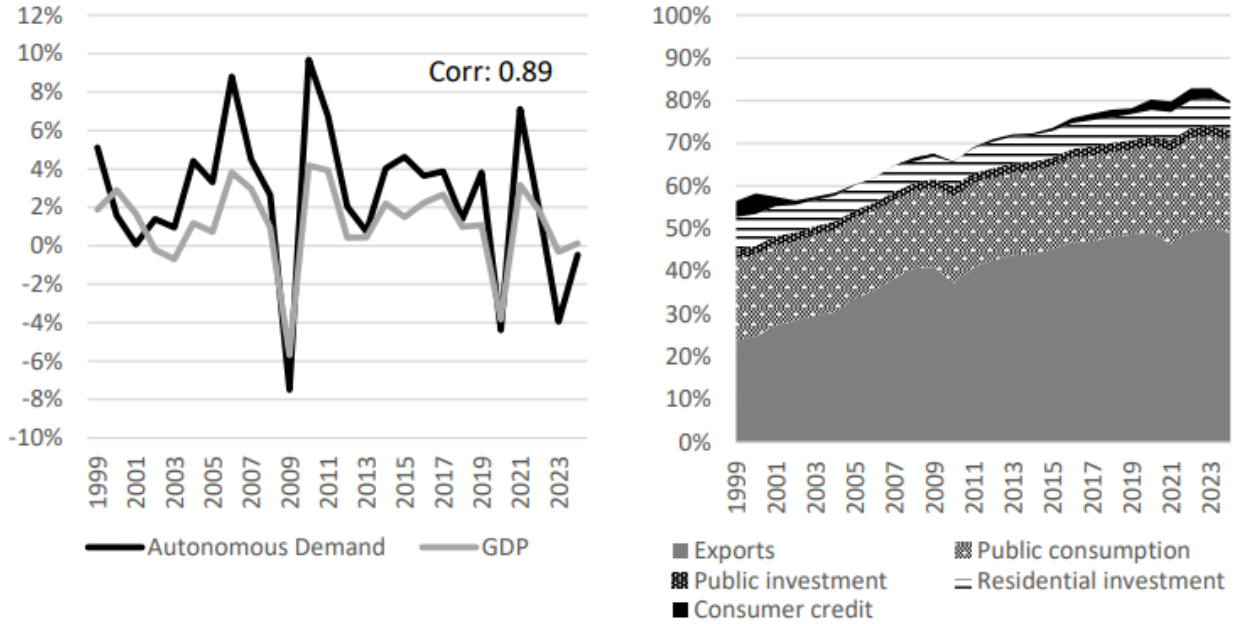
  - Aggregate demand is separated into autonomous (Z) and induced components, with the latter generating the supermultiplier (α), depending on the propensity to consume, the inducement to invest and the propensity to import
  - The decomposition accounts for proportional induced demand contributions via the supermultiplier that are generated by changes in autonomous components, including not only direct effects but also indirect effects of these changes

2.2 Autonomous demand-led growth decomposition

Figure 1. Autonomous demand and GDP in Germany, 1999-2024.

A. Growth rates of autonomous demand and GDP, percentage

B. Components of autonomous demand as percentage of real GDP

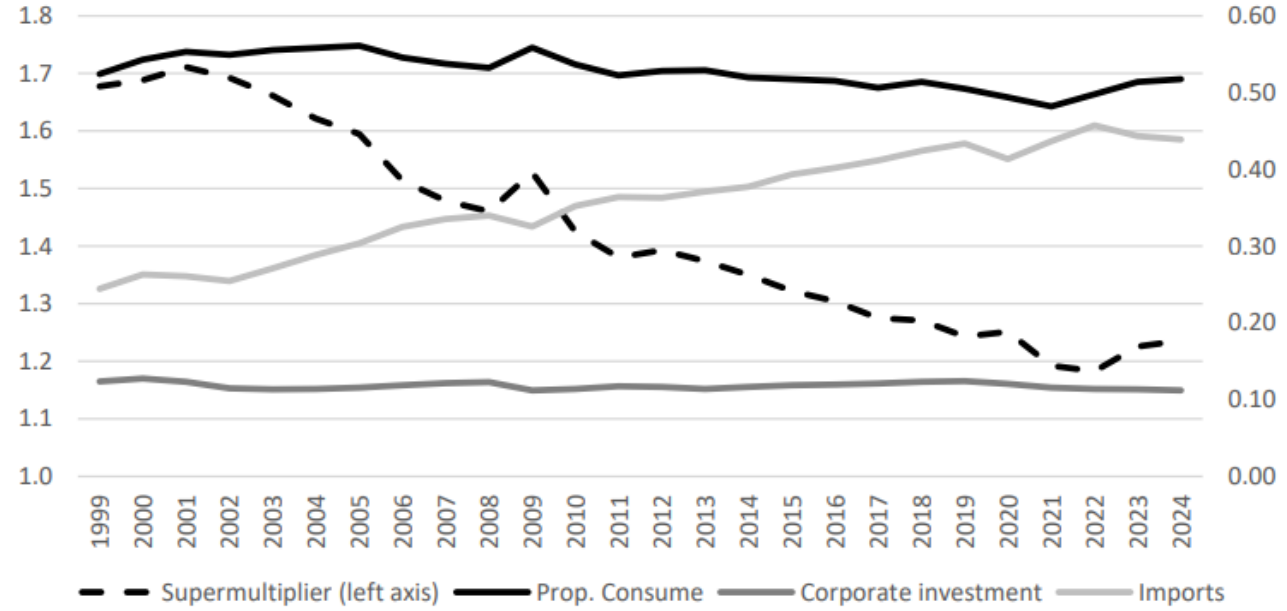


Source: European Commission (2024), OECD (2024), BIS (2024), authors' calculations and presentation.

- High correlation between the growth rates of autonomous demand and GDP
- Share of autonomous demand in GDP grew consistently
- Increasingly dominant role of exports, increasing degree of openness

2.2 Autonomous demand-led growth decomposition

Figure 2. Evolution of the supermultiplier and its components in Germany, 1999-2024.



Source: European Commission (2024), OECD (2024), BIS (2024), authors' calculations and presentation.

- The supermultiplier has steadily declined
- The fall is mainly explained by the evolution of the propensity to import, increasing degree of openness
- Main consequence of a lower supermultiplier: lower impact of changes in autonomous demand components

2.2 Autonomous demand-led growth decomposition

Table 3. Autonomous demand-led growth decomposition in Germany: average annual growth of real GDP, autonomous and induced components of demand, in percent, 1999-2009, 2010-2020 and 2021-2024.

A. Contributions to growth of autonomous and induced components of demand

		1999-2009	2010-2020	2021-2024
	GDP	0.87	1.44	1.20
	Total Z	2.14	3.16	1.02
Autonomous components	G	0.40	0.54	0.30
	I_G	0.05	0.07	-0.04
	X	2.42	2.03	1.35
	I_H	-0.17	0.20	0.03
	CC	-0.56	0.32	-0.62
	Total induced	-1.09	-1.78	-0.27
Induced components	C_H	0.43	-0.79	0.73
	M	-1.41	-1.09	-0.74
	I_c	-0.10	0.11	-0.26
	Inventories	-0.24	0.05	0.42

B. Sectoral contributions to growth

	1999-2009	2010-2020	2021-2024
GDP	0.87	1.44	1.20
Domestic sector	-0.20	0.49	0.57
Private sector	-0.65	-0.12	0.31
C_H	0.43	-0.79	0.73
I_c	-0.10	0.11	-0.26
CC	-0.56	0.32	-0.62
I_H	-0.17	0.20	0.03
Inventories	-0.24	0.05	0.42
Public sector	0.45	0.61	0.26
G	0.40	0.54	0.30
I_G	0.05	0.07	-0.04
External sector	1.01	0.94	0.61
X	2.42	2.03	1.35
M	-1.41	-1.09	-0.74

Source: European Commission (2024), OECD (2024), BIS (2024), authors' calculations and presentation.

- Dominance of export growth as main source of growth
- But declining trend of growth contributions of exports
- Domestic demand increased its contribution through different autonomous and induced components

3. Exports, international trade and the productive structure

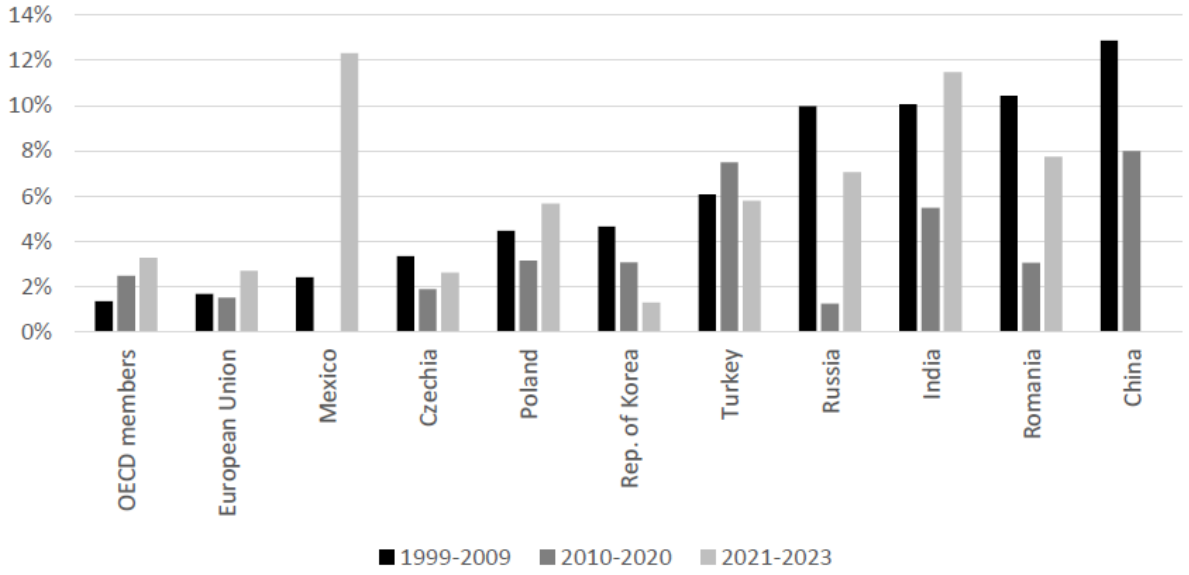
- **Exports play a key role in Germany's economic growth. What kind of export-led regime?**
  - Focus on exports of goods to identify main trade partners, dominant products and level of technological content

- **Destination** (UN COMTRADE, 2024)
  - Current EU 27: main destination of German exports during the entire period
  - Decline in the share of exports to western EU economies and the Eurozone (e.g., France, Italy, Belgium, Spain), while consistent increase in the share of exports to eastern EU countries, most of which have not yet adopted the euro as their currency (e.g., Poland, Czechia, Romania)
  - China and India among the fastest growing extra-EU export destinations. However, only China became one of Germany’s main trading partners, India’s share remained modest
  - Other important high growth emerging markets: Russia and Turkey

- **Products** (UN COMTRADE, 2024)
  - Composition dominated by capital goods (40% of total in 1999-2009), relatively stable over time
  - Vehicles and pharmaceuticals are also dominant (20% of German exports), growing importance of the latter

3. Exports, international trade and the productive structure

Figure 4. Growth rates of real gross fixed capital formation for OECD members, the European Union and emerging countries that are German main trading partners. Annual averages for the periods 1999-2009, 2010-2020 and 2021-2023, in percentage.



Note: available data for China includes only the period 1999-2019.
Source: World Bank (2024), FRED (2024), authors' calculations and presentation.

- High investment growth in the first period in emerging countries that are important export destinations contributed to a rising share of exports in German GDP
- Slowdown in the second period and deceleration of export growth

3. Exports, international trade and the productive structure

- **Technological content** (WITS, 2024)
  - High technology products tend to grow faster in world trade and present higher income elasticities (Lall, 2000)
  - Ranks first regarding the share of medium and high technology exports, average of 66% in 1999-2023
  - Advantage in medium tech, higher average high-tech share than Italy but lower than France, China and the US

Table 6. Technological classification of German exports. Annual averages for the periods 1999-2009, 2010-2020 and 2021-2023. Percentage of total.

	1999-2009	2010-2020	2021-2023
High Tech	18.8	19.2	19.7
Medium Tech	47.8	47.2	45.7
Low Tech	15.5	15.0	14.7
Primary Products	5.1	5.5	6.3
Resource-based products	12.6	13.5	13.3

Source: WITS (2024), authors' calculations and presentation.

- **Germany's export led regime**
  - Based on long-run persistent structural conditions. Exports dominated by capital goods and medium and high technology products with high demand income elasticity benefited from accelerated growth of emerging countries

4. Macroeconomic policy regime and the Eurozone governance system

Table 7. Macroeconomic policy regime indicators in Germany. Annual averages for the periods 1999-2009, 2010-2020 and 2021-2024.

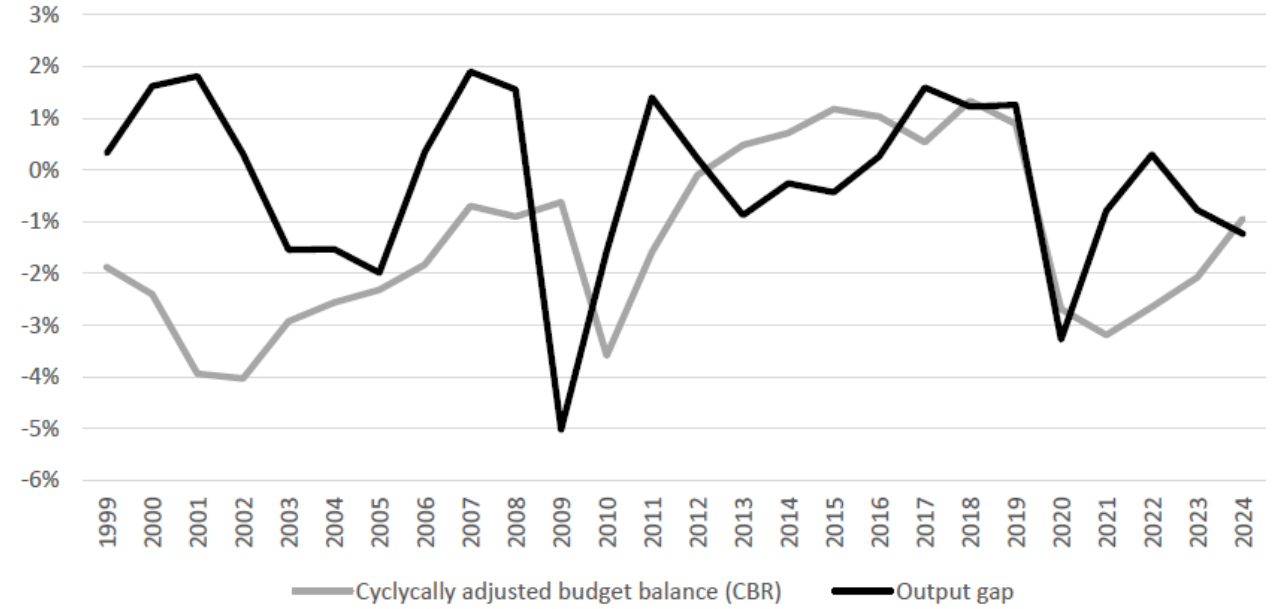
	1999-2009	2010-2020	2021-2024
Monetary policy (*)			
Short-term real interest rate, %	2.21	-1.45	-3.71
Long-term real interest rate, %	3.22	-0.68	-3.72
Long-term real interest rate minus real GDP growth, pp.	2.35	-2.11	-5.27
Wage policy			
Nominal unit labor costs (ULC), annual growth, %	0.99	1.93	3.89
Inflation rate (HCPI), % (*)	1.56	1.32	5.99
Adjusted wage share, current prices, %	57.07	57.62	57.52
Change in adjusted wage share from previous decade	-2.06	0.55	-0.10
Fiscal policy			
Cyclically adjusted budget balance (CBR) (as % of potential GDP), annual change, pp.	0.18	-0.19	0.44
Output gap (as % of potential GDP), annual change, pp.	-0.45	0.16	0.51
Number of years with pro-cyclical fiscal policy (c: contractionary, e: expansionary)	5 (3 c, 2 e)	8 (4 c, 4 e)	3 (2 c, 1 e)
Public investment, % of GDP	2.12	2.27	2.42
Open economy			
Change in real effective exchange rate (REER), vis-à-vis 37 industrial countries, ULC-based, %	-0.63	0.25	-0.32
OEC Economic Complexity Index (ECI) Trade (**)	1.87	1.90	1.80
Ranking ECI Trade (**)	2.00	3.36	5.00
Real exports of goods and services, % of GDP	33.40	45.73	49.31
Real imports of goods and services, % of GDP	29.20	39.15	44.41

Notes: 'pp.' indicates percentage points; (*) no data available for 2024; (**) no data available for 2023 and 2024.
Source: European Commission (2024), Eurostat (2024), OEC (2024), OECD (2024), authors' calculations and presentation.

- **Set of monetary, fiscal, and wage/income policies**, along with their coordination and interaction, within the institutional framework of an economy, including the **degree of openness and the exchange rate regime**
- **Macroeconomic policies** and aggregate demand have a **long term impact** on output, income, employment, inflation, distribution, and growth through various channels (Hein, 2023)

4. Macroeconomic policy regime and the Eurozone governance system

Figure B.4. Cyclically adjusted budget balance (CBR) and output gap, 1999-2024, percentage of potential GDP.



Source: European Commission (2024), authors' presentation.

- Assessment of short-term discretionary responsiveness of **fiscal policies** by examining annual changes in **CBRs and output gaps**
- When they move in the same direction, fiscal policies are counter-cyclical, as governments reduce (increase) structural deficits or increase (reduce) structural surpluses during an economic upswing (downswing).

4. Macroeconomic policy regime and the Eurozone governance system

- **1999-2009**
  - Germany's macroeconomic policy regime (MPR) significantly contributed to its ELM demand and growth regime
  - **Restrictive monetary policy** stance imposed by ECB monetary policies, with a considerably positive differential between the real long-term interest rate and real GDP growth
  - Private domestic demand restriction exacerbated by **deflationary wage policies**: 1) contributing to inflation rates below ECB target and higher real interest rates; 2) leading to a declining labor income share in a wage-led economy
  - Fiscal policies pressured by the goals of the SGP, with a **pro-cyclically contractionary stance**: a negative change in the output gap answered by a positive change in the cyclically adjusted budget balance (CBR).
  - **Improved international price competitiveness**: fall in REER, nominal devaluation of Euro in first years and low domestic inflation in Germany; **high non-price competitiveness**: high economic complexity index (ECI) given by structural composition of exports
  - **Low growth exclusively driven by exports**, autonomous and induced domestic demand contributed negatively to growth, **contribution to CA imbalances** both at global scale and within the Eurozone

4. Macroeconomic policy regime and the Eurozone governance system

- **2010-2020**
  - Gradual shift in Germany's MPR without changing the dominance of autonomous exports as a growth driver
  - **Negative real interest rates** with positive impact on credit-financed consumption and residential investment. Expansionary monetary policy result of 1) falling and then zero short-term nominal interest rate policies of the ECB since 2016 as response towards Eurozone crisis and stagnation; 2) low country-specific risk with regard to long-term nominal interest rates
  - **Contribution of wage policies to expansionary stance** through nominal unit labor cost growth close to the ECB target inflation rate and slight increase in labor income share with low inflation in Germany
  - **Pro-cyclical fiscal policy**, with average expansionary stance: output gap rising and the CBR falling. However, **decreasing public sector deficits** allowed by relatively dynamic private domestic and foreign demand, reinforced by introduction of the 'debt brake' limiting federal budget expenses
  - **Open economy conditions remained favorable**: slight increase in REER but high ECI

4. Macroeconomic policy regime and the Eurozone governance system

- **2021-2024**
  - Difficult to asses due to lack of data for the last two years, trends interpreted with caution
  - **ECB monetary policy stance for Germany remained expansionary** with negative short- and long-term interest rates and a negative real interest rate-real GDP growth differential, although the ECB started to raise short-term money market rates in July 2022
  - **Wage policies**, on average, generated **nominal unit labor cost growth** well above the ECB target rate of inflation, but did not keep up with **high inflation** rates generated by the energy price shock and supply side bottlenecks, meaning **falling labor income shares**
  - **Average counter-cyclical fiscal policy**
  - **Open economy conditions remained favorable** with a slight real devaluation and falling but still very high ECI
  - Autonomous exports continued to be a main growth driver, although with lower contributions. Autonomous public consumption and induced private consumption also contributed to growth. The **domestic and external sector had similar contributions**, and in the national income and financial accounting decomposition Germany turned **WEL,** with initially high growth in 2021 and 2022, but stagnation in 2023 and 2024.

4. Macroeconomic policy regime and the Eurozone governance system

- 16 indicators summarized in 4 policy areas

Table 8. Macroeconomic policy regime in Germany for the periods 1999-2009, 2010-2020 and 2021-2024.

	1999-2009	2010-2020	2021-2024
Monetary policy	-	+	+
Wage policy	-	+	0/-
Fiscal policy	-	+/-	0/-
Open economy conditions	+	0/+	0/+

Notes: expansionary stance (+), contractionary stance (-), neutral stance (0).

Source: authors' presentation.

5. Conclusions

- **The German economy is structurally export-led,** based on exports of capital goods and medium-high technology products with a high income elasticity of demand
- **High current account surpluses** contributing to **regional and global imbalances** can only be **avoided by an adequate macroeconomic policy mix** providing high domestic demand that generates sufficient imports to roughly balance high exports (Hein and Truger, 2017)
  - Monetary policies contributing to low long-term real interest rates
  - Wage policies stabilizing functional distribution and inflation at the Eurozone target rate
  - Fiscal policies stabilizing domestic demand at non-inflationary full employment levels
- **Policy coordination in the Eurozone context and changes in its governance system are needed**
  - ECB becoming an unconditional lender of last resort for member state governments
  - Institutions and power resources for wage bargaining coordination, within member states and at the Eurozone level
  - Coordination mechanism of fiscal policies which provides sufficient leeway for member state fiscal policies or establishment of a relevant fiscal authority at the Eurozone level

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Thank you!

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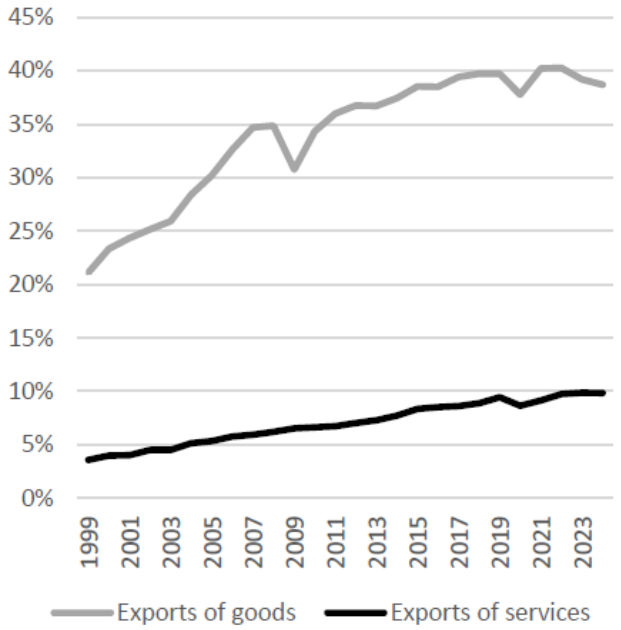
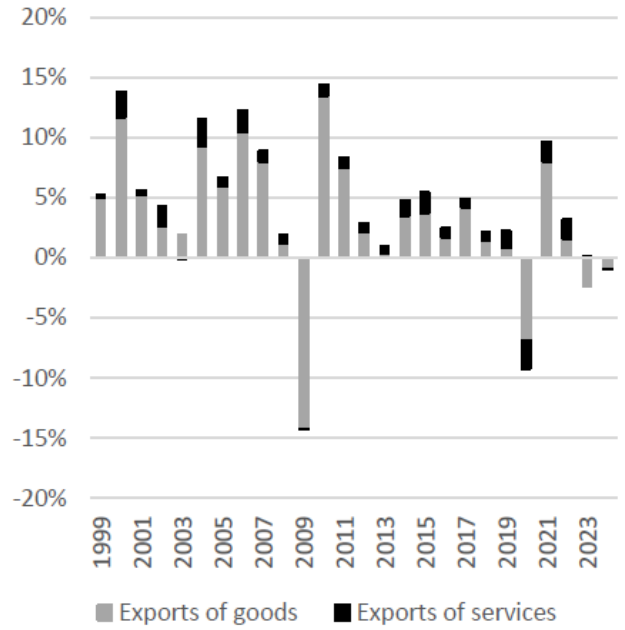
Appendix I

Figure 3. Exports of goods and services, Germany, constant prices, 1999-2024.

A. Export of goods and services, percentage of real GDP.



B. Contributions to real export growth by goods and services, percentage points.



Source: European Commission (2024), authors' calculations and presentation.

Appendix II

Table 4. Share of main trading partners in German exports of goods. Annual averages for the periods 1999-2009, 2010-2020 and 2021-2023, current US dollars, in percent.

	1999-2009	2010-2020	2021-2023
World	100.0	100.0	100.0
EU 27	56.1	51.3	53.0
Eurozone	44.6	37.7	37.0
France	10.4	8.8	7.4
Netherlands	6.3	6.3	6.7
Italy	7.1	5.3	5.3
Belgium	4.7	3.9	3.7
Spain	4.6	3.3	3.1
Slovakia	0.7	1.0	1.1
Non-Eurozone EU	11.5	13.6	16.0
Poland	2.8	4.3	5.6
Czechia	2.4	3.0	3.3
Hungary	1.7	1.7	2.0
Romania	0.6	1.0	1.3
Extra-EU 27	43.9	48.7	47.0
USA	9.1	8.2	9.1
China	2.4	6.2	7.4
UK	7.9	6.5	5.0
Switzerland	4.1	4.3	4.6
Turkey	1.4	1.7	1.7
Rep. of Korea	0.8	1.3	1.4
Japan	1.8	1.5	1.4
Russia	2.0	2.6	1.6
Mexico	0.8	0.9	1.0
India	0.5	0.9	0.9

Source: UN Comtrade (2024), authors' calculations and presentation.

Appendix III

Table 5. Share of main products in German exports of goods. Annual averages for the periods 1999-2009, 2010-2020 and 2021-2023, current US dollars, HS2 (as reported) classification, in percent.

	1999-2009	2010-2020	2021-2023
Machinery and mechanical appliances	18.5	17.2	16.0
Vehicles	16.9	17.0	16.0
Electrical machinery and equipment	10.9	10.3	11.0
Pharmaceutical products	3.5	5.6	7.3
Optical, photographic and medical instruments	4.0	4.8	4.9
Plastics	4.3	4.2	4.3
Iron and steel, and articles thereof	4.3	4.1	4.1
Aircraft and spacecraft	2.4	2.8	1.8
Other commodities not specified	5.0	2.9	2.2
Mineral fuels and oils and their distillation	1.9	2.2	2.8

Note: the product names have been slightly modified for presentation purposes.

Source: UN Comtrade (2024), authors' calculations and presentation.

Appendix IV

Table 6. Technological classification of German exports. Annual averages for the periods 1999-2009, 2010-2020 and 2021-2023. Percentage of total.

	1999-2009	2010-2020	2021-2023
High Tech	18.8	19.2	19.7
Medium Tech	47.8	47.2	45.7
Low Tech	15.5	15.0	14.7
Primary Products	5.1	5.5	6.3
Resource-based products	12.6	13.5	13.3

Source: WITS (2024), authors' calculations and presentation.

Appendix V

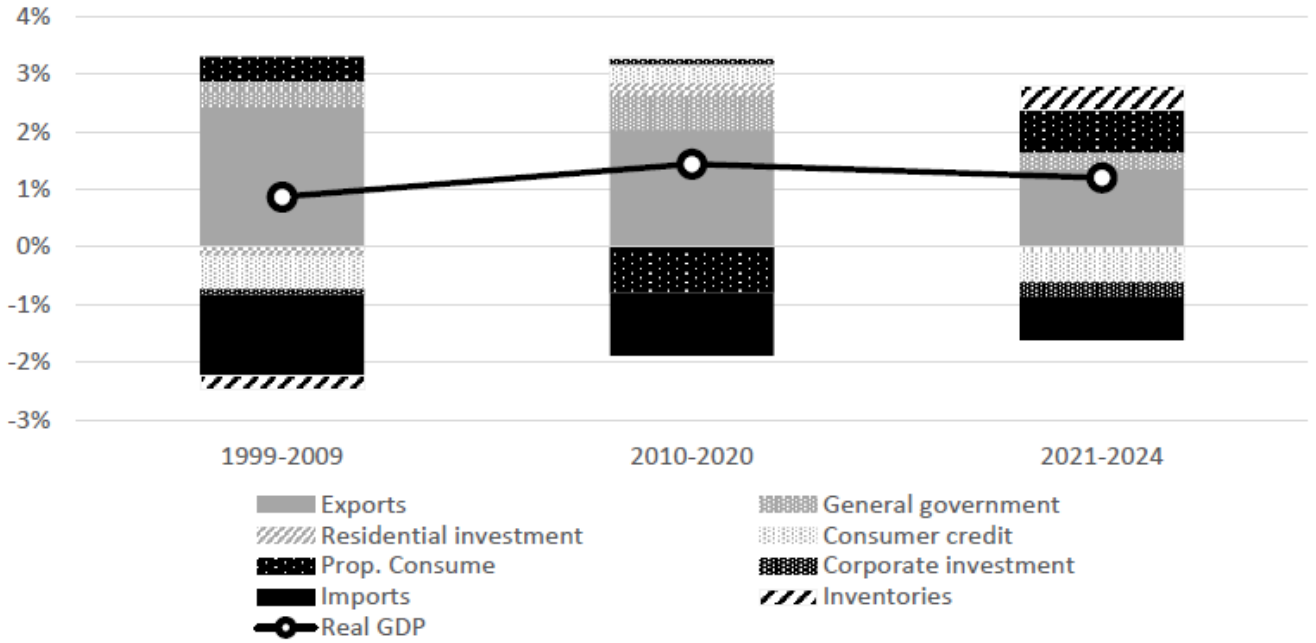
Table B.1. Technological classification of exports for France, Italy, China and the United States. Annual averages for the periods 1999-2009, 2010-2020 and 2021-2023. Percentage of total.

		1999-2009	2010-2020	2021-2023
France	High Tech	19.9%	21.9%	17.3%
	Medium Tech	37.5%	34.4%	35.0%
	Low Tech	16.5%	16.7%	18.0%
	Primary Products	8.3%	8.7%	10.0%
	Resource-based products	17.6%	18.4%	20.0%
Italy	High Tech	9.2%	8.5%	9.0%
	Medium Tech	39.3%	38.8%	37.7%
	Low Tech	32.6%	29.4%	28.7%
	Primary Products	4.4%	5.5%	6.7%
	Resource-based products	14.8%	17.8%	18.3%
China	High Tech	31.2%	34.9%	33.3%
	Medium Tech	19.5%	21.9%	25.3%
	Low Tech	36.1%	31.9%	29.7%
	Primary Products	4.8%	3.0%	3.0%
	Resource-based products	8.3%	8.3%	9.0%
United States	High Tech	30.3%	20.9%	20.0%
	Medium Tech	33.6%	32.9%	30.0%
	Low Tech	12.0%	11.4%	10.0%
	Primary Products	8.7%	12.0%	17.0%
	Resource-based products	15.5%	23.3%	22.7%

Source: WITS (2024), authors' calculations and presentation.

Appendix VI

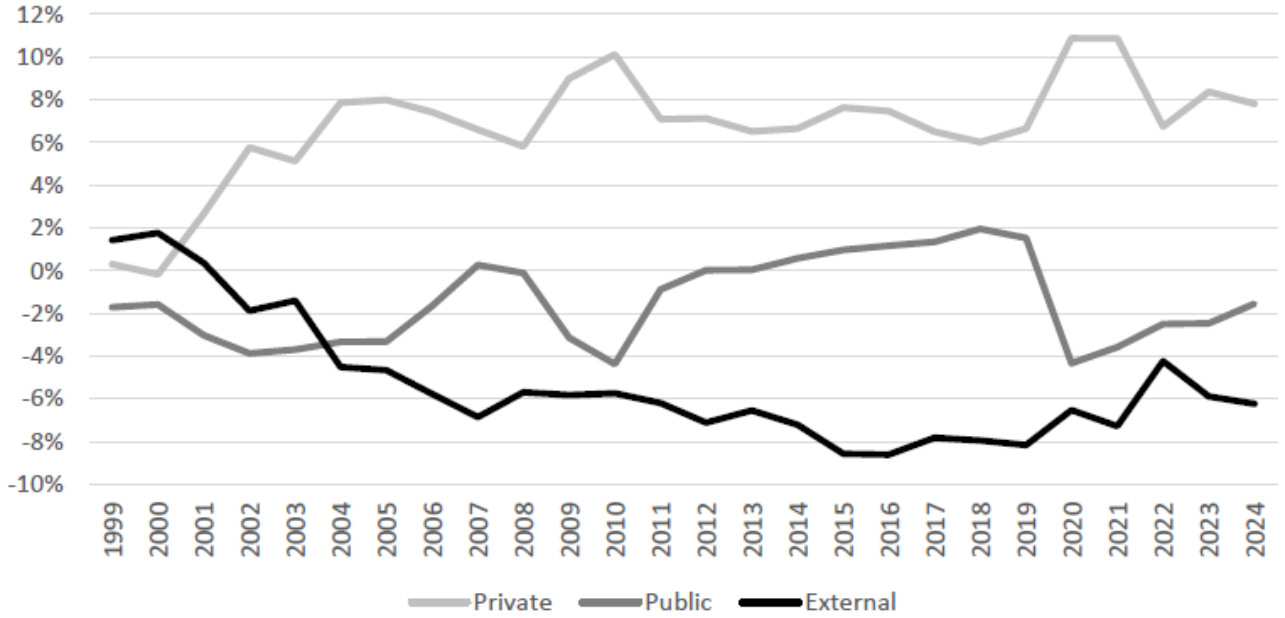
Figure B.1. Autonomous demand-led growth decomposition in Germany, 1999-2024. Growth contributions, percentage points.



Source: European Commission (2024), authors' calculations and presentation.

Appendix VII

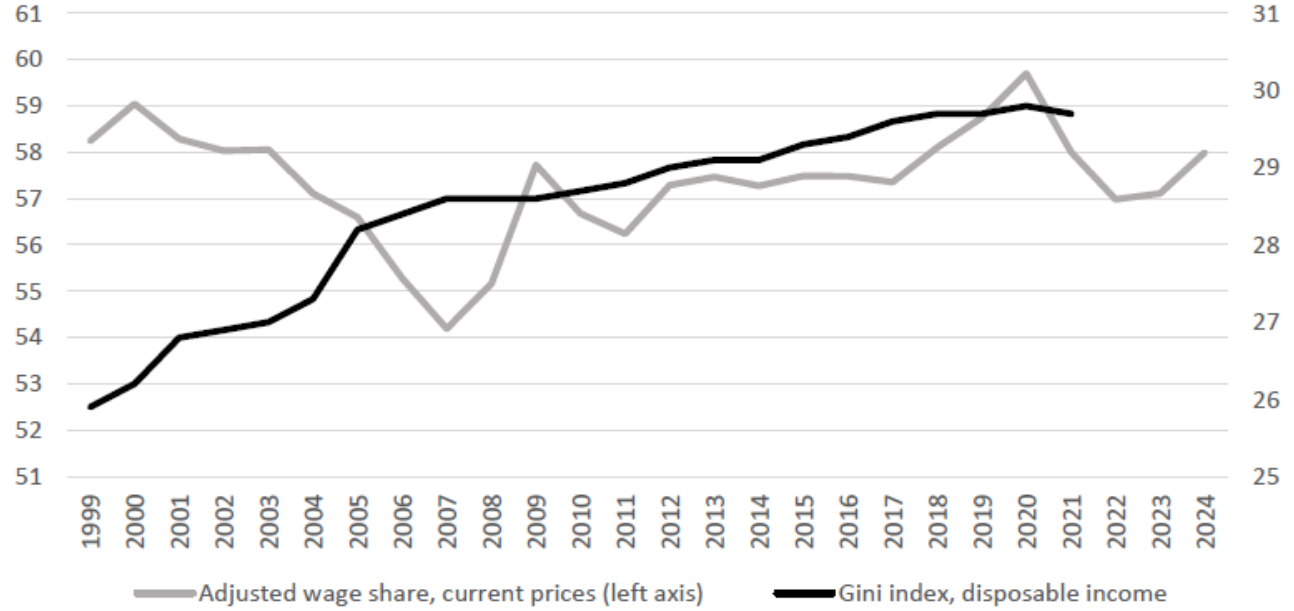
Figure B.2. Evolution of sectoral financial balances, 1999-2024, percentage of GDP.



Source: European Commission (2024), authors' presentation.

Appendix VIII

Figure B.3. Adjusted wage share (current prices, percentage of GDP) and Gini coefficient (disposable income), 1999-2024.



Note: due to data availability, the Gini index is presented for the period 1999-2021.
Source: European Commission (2024) and Solt (2020), authors' presentation.