



GERMANY

Competitive Industrial Performance in 2012

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Executive Summary

In the Competitive Industrial Performance (CIP) ranking, Germany moved up to the second-placed in 2012, overtaking the United States but behind Japan. Indeed, on the trade side, Germany is the only top ranking country which managed to capture some additional shares of the world market, remaining the world second largest manufactured exporter with a share of world manufactured exports of 10% despite a major slowdown during the financial crisis. Yet, on the production side, its impact worldwide is declining, though it has been able to maintain its Manufacturing Value Added (MVA) per capita level during the last decade while most European countries have suffered a large decline.

Germany's manufacturing sector is a key factor in its macroeconomic performance, with a strong industrial core and an ability to control complex industrial value creation chains. Its medium- and high- tech exports accounts for 72% of its total manufactured exports and it has been able to maintain its technological lead against newcomers in the global economy. Germany has thus a strong technological upgrading and deepening, both on the production and on the trade side.

Owing to its reputation as a worldwide reference in the export quality, Germany is a leading exporter in all its top exports, by being almost always the first or second world largest exporter in 2012. Its exports are also diversified and seem to follow the changing lifestyles and demographic trends, becoming the world first largest exporter of medicaments and pharmaceuticals products for example.

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1. Capacity to produce and export

Two decades of stagnation

Germany's Manufacturing Value Added (MVA) per capita has experienced two decades of stagnation (Table 1). But this stagnation refers to two different performances. Between 1990 and 2000, countries like the United States, the Republic of Korea or even France have undergone a rise and thus performed better than Germany. However, after 2000, most European countries have suffered a large decline, while Germany was able to maintain its MVA per capital level, showing its greater industrial competitiveness. Thus, in the face of the global financial crisis, the German economy has proved remarkably resilient, outperforming other large, high-income European economies.

A declining industrial power on the world stage

Because of this stagnation, Germany is declining on the world stage: its MVA per capita only ranked 11st in 2010, falling by 8 spots in two decades, and has now been dwarfed by that of the United States and the Republic of Korea. As a consequence, its share in world MVA decreased from 8.5% in 1990 to 5.3% in 2010, passing behind China. In spite of this, Germany is still the world fourth largest industrial producer, lagging behind the international roles models but well ahead of its main European competitors.

Table 1: Manufacturing value added per capita for Germany and comparators, 1990-2010

Country	Value (US\$)			Average annual growth rate			Gain/Loss in world share (percentage points)
	1990	2000	2010	1990-2010	1990-2000	2000-2010	
Japan	7,753	8,140	7,994	0.2%	0%	0%	- 7.9 pts
United States of America	4,145	5,417	5,522	1.4%	3%	0%	- 0.3 pts
Republic of Korea	1,443	2,876	4,783	6.2%	7%	5%	+ 1.8 pts
Germany	4,652	4,768	4,667	0.0%	0%	0%	- 3.2 pts
United Kingdom	3,704	3,856	3,162	-0.8%	0%	-2%	- 2.2 pts
France	2,677	3,218	2,885	0.4%	2%	-1%	- 1 pts
Italy	3,152	3,562	2,848	-0.5%	1%	-2%	- 1.8 pts
Poland	235	734	1,490	9.7%	12%	7%	+ 0.6 pts
China	100	303	820	11.1%	12%	10%	+ 12.7 pts

Source: UNIDO, Competitive Industrial Performance Index.

A leading industrial exporter

Its performance on the trade side is impressive, both in terms of level and growth (Table 2). Despite the booming manufactured exports from emerging countries and especially from China with an impressive double-digit growth, With a share of world manufactured exports of 10%, Germany remained the world second largest manufactured exporter, with China becoming the world first largest manufactured exporter in place of the United States. Germany is the only top-industrialized country which has been able to gain some world market shares, due to a striking manufactured exports growth of 9% per year on average during the last decade. This shows the larger Germany's capacity to meet global demand for manufactured goods in a highly competitive and changing environment.

But a major slowdown in exports during the financial crisis

Germany has been largely affected by the recent financial crisis and saw a major slowdown in manufactured trade with the US and EU markets. Domestic demand is therefore becoming a more significant driver of Germany's economic expansion. Yet, other countries like the Republic of Korea or Japan seem to have been unaffected, which shows their higher competitiveness and adaptability to be able to address this historic crisis.

Table 2: Manufactured exports per capita for Germany and comparators, 2000-2010

Country	Value (US\$)			Average annual growth rate			Gain/Loss in world share (percentage points)
	2000	2005	2010	2000-2010	2000-2005	2005-2010	
Germany	5,848	10,781	13,397	9%	13%	4%	+ 0.3 pts
Republic of Korea	3,559	5,802	9,280	10%	10%	10%	+ 0.8 pts
France	4,432	6,355	7,237	5%	7%	3%	- 1.2 pts
Italy	3,928	5,897	6,935	6%	8%	3%	- 0.9 pts
Japan	3,584	4,366	5,521	4%	4%	5%	- 2.9 pts
United Kingdom	3,928	5,299	5,248	3%	6%	0%	- 1.8 pts
Poland	704	2,003	3,640	18%	23%	13%	+ 0.7 pts
United States of America	2,181	2,309	2,736	2%	1%	3%	- 4.8 pts
China	180	550	1,124	20%	25%	15%	+ 9.4 pts

Source: UNIDO, Competitive Industrial Performance Index.

2. Technological upgrading and deepening

Evidence suggests that technology intensive structures can lead to faster growth because, over the long run, technology intensive activities tend to grow faster in trade than simple activities. These sectors are also less vulnerable to entry by competitors and therefore enjoy higher and more sustainable margins.

A strong and high-quality industrial sector

Germany's competitiveness stems a relatively high level of specialization in industrial manufacturing. Compared to other countries, Germany's manufacturing sector is a key factor in its macroeconomic performance, with industry accounting for 23% of the gross value added in Germany. This figure was considerably lower in France (12%), the United Kingdom (12%) and the United States (13%). German industry sector is not only important for the German economy, but is also renowned as a technology leader and famous for its innovative developments, with one of the highest share of medium- and high-technology in total MVA.

A worldwide reference in the export quality

Manufactured exports now account for 87% of Germany's total exports, a quite similar figure to that in other highly industrialized economies and far above the United States' level (Table 3). Similarly, with a share of medium- and high-technology in total manufactured trade of 72%, Germany's export quality is one of the highest in the world, ahead of all its European neighbors but behind Japan and the Republic of Korea.

A need to maintain this export quality to deal with international competition

While some emerging countries like China or Poland are achieving a fairly quick technological sophistication, the real challenge for Germany is to maintain or even upgrade the technological sophistication of its industries. Given the success of recent decades, German industry has shown itself to be able to maintain its technological lead against newcomers in the global economy, whereas countries like the United States or Japan follow a declining trend in technological sophistication.

Table 3: Export quality for Germany and comparators, 2010

Country	Share of manufactured trade in total trade	Share of Medium- and High-technology trade in total manufactured trade	
		2000	2010
Japan	92%	85%	80%
Republic of Korea	97%	70%	76%
Germany	87%	73%	72%
France	88%	67%	66%
United States of America	77%	76%	65%
United Kingdom	80%	70%	63%
China	96%	46%	61%
Poland	88%	48%	58%
Italy	92%	53%	54%

Source: UNIDO, Competitive Industrial Performance Index.

A leading exporter of the most dynamic high-tech products

The ability of Germany to quickly shift production and export structures to meet global demand can be assessed by its performance in the world's most dynamic high-technology products (Table 4). Germany has been able to gain market shares in almost all these products, becoming or remaining the world first or second largest exporter of 6 out of 10 products, with a worldwide market share of 14% on average in these products. Such a performance indicates that the country is able to respond to the dynamics of world demand, an important component of the industrial competitiveness.

Table 4: Germany's performance in the world's 10 most dynamic high-technology products, 2002-2012

Code	High-technology product	World exports		Germany's exports	
		2012 Value (US\$ millions)	Annual growth rate 2002-2012	2012 Value (US\$ millions)	Annual growth rate 2002-2012
871	Optical instruments and apparatus	109,161	24.1%	3,170	9.7%
751	Office machines	51,266	16.1%	4,474	14.5%
541	Pharmaceutical products, except medicaments	168,463	15.1%	22,959	16.5%
718	Other power generating machinery and parts	24,966	14.1%	3,948	14.3%
525	Radio-actives and associated materials	16,135	12.1%	1,523	16.1%
716	Rotating electric plant and parts thereof	97,219	11.4%	13,227	13.8%
771	Electric power machinery, and parts thereof	92,592	11.3%	8,860	12.2%
542	Medicaments (incl. vet)	334,151	10.3%	45,751	13.8%
874	Measuring, analyzing and controlling apparatus	185,142	9.8%	30,327	10.2%
764	Telecommunication equipment and parts	521,442	9.7%	18,352	1.3%

Source: UNCTADstat.

3. Product diversification

A leading exporter of medium- and high-tech exports

Germany's top 15 exports are all manufactured exports, showing how much the industrial sector is important for the German economy. What is even more remarkable is that Germany's areas of excellence are almost all medium- and high- technology exports (Table 5). Not only it exports technologically sophisticated products, but Germany is also a leading exporter in all its top exports, by being almost always the first or second world largest exporter. Thus, its worldwide market share is more than 10% in 11 out of 15 products, a stable figure over time.

Exports are diversified and follow the world demand

Its top five manufactured exports in 2012 were motor vehicles, parts/accessories of vehicles, medicaments, aircraft/spacecraft and apparatus for electrical circuits. These together accounted for around 22% of total exports in 2012, a similar figure to that in 2002, suggesting that its exports were and remain diversified. Indeed, its geographical position also gives to Germany the possibility to lead the European market and to manage a relevant diversification of its internal economy. This helps the country protect itself from weak demand in specific products and the emergence of strong competitors in the world's largest markets.

Traditionally, German industry excels in sophisticated technology, *e.g.* automotive and mechanical engineering, the chemical industry and electrical engineering, but it has also made significant gains in cutting-edge technologies and developed particular expertise in the area of medical devices and instrumentation. Furthermore, German industry must adapt its value creation to changing lifestyles and values. For instance, medical and pharmaceutical products are becoming more important due to demographic trends: Germany became the world first largest exporter of medicaments (SITC 542) and pharmaceuticals products (SITC 541).

An anthill of powerful small and medium enterprises

Throughout last years, German small and medium enterprises, often called "hidden champions", even performed better than the large ones. In contrast to the practice of the other European countries to develop economies related on large state-owned industrial champions, Germany could be considered such as a private driven economy in which the small and medium enterprises are playing the most important role in boosting investments and employment rate. They also make the success of German export with the 80% of the production sold abroad.

Table 5: Germany's top 15 exports, 2002-2012

Technology Classification	Code	Product	World exports		Germany's exports	
			2012 Value (US\$ millions)	Annual growth rate 2002-2012	2012 Value (US\$ millions)	Annual growth rate 2002-2012
Medium-tech	781	Motor vehicles for the transport of persons	646,149	6.5%	146,301	6.6%
Medium-tech	784	Parts and accessories of vehicles	360,447	9.0%	53,175	10.0%
High-tech	542	Medicaments (incl. veterinary medicaments)	334,150	10.3%	45,751	13.8%
High-tech	792	Aircraft and associated equipment; spacecraft	169,645	4.5%	43,133	9.9%
Medium-tech	772	Apparatus for electrical circuits; board, panels	237,344	10.3%	30,485	9.9%
High-tech	874	Measuring, analyzing and controlling apparatus	185,141	9.8%	30,326	10.2%
Medium-tech	713	Internal combustion piston engines, parts	159,303	8.3%	25,356	8.5%
Medium-tech	728	Other machinery for particular industries	174,473	10.9%	24,986	8.8%
High-tech	541	Pharmaceuticals products, except medicaments	168,462	15.1%	22,958	16.5%
Medium-tech	743	Pumps, gas compressors and fans; centr.	123,361	10.7%	20,257	11.1%
Medium-tech	778	Electrical machinery and apparatus	225,843	9.1%	19,623	6.7%
High-tech	764	Telecommunication equipment and parts	521,441	9.7%	18,352	1.3%
High-tech	776	Cathode valves and tubes	555,286	8.0%	18,045	4.6%
Low-tech	699	Manufactures of base metal	145,143	10.0%	18,015	8.5%
Resource-bas.	334	Petroleum oils, bituminous minerals > 70 % oil	1,018,259	21.7%	18,010	14.9%

Source: UNCTADstat.

4. World competitiveness rankings

UNIDO's index is based on quantitative and transparent indicators

The CIP index consists of eight sub-indicators grouped along three dimensions of industrial competitiveness: the countries' capacity to produce and export manufactures; the countries' level of technological deepening and upgrading; and the countries' impact on world manufacturing. This way, the CIP index does not make any implicit normative assumptions or prescriptions at the institutional level.

And give a better rank to Germany

While Germany is the 2nd most competitive countries in the world according to the UNIDO ranking, its position is lower in the World Economic Forum (WEF) ranking (6th) and in the Institute for Management Development (IMD) ranking (9th) (Table 6). For the WEF, Germany's labor market remains rigid, where a lack of flexibility in wage determination and the high cost of firing hinder job creation. Yet, regardless of the ranking used, Germany remains among the 10 most competitive countries in the world, ahead of its main European competitors.

Table 6: Countries' ranking in the CIP index 2012 and movements across competitiveness rankings

Country	UNIDO ranking		WEF ranking	Ranking difference CIP - WEF	IMD ranking	Ranking difference CIP - IMD
	2000	2012	2012		2012	
Japan	1	1	10	-9	27	-26
Germany	3	2	6	-4	9	-7
United States of America	2	3	7	-4	2	+1
China	23	7	29	-22	23	-16
France	5	10	21	-11	29	-19
Italy	7	11	42	-31	40	-29
United Kingdom	4	14	8	+6	18	-4
Poland	33	25	41	-16	34	-9

Source: UNIDO, Competitive Industrial Performance Report 2012/2013.

Concluding remarks

Germany has come to occupy a unique position in studies of competitiveness, particularly since most European countries like France or the United Kingdom now take German competitiveness as a benchmark. Indeed, in the Competitive Industrial Performance (CIP) index, Germany ranked 2nd in 2012, overtaking the United States but behind Japan. Germany benefits greatly from its significant market size, which is based on both its large domestic market and especially its strong exports. Germany also has a major competitive edge in technological sophistication with companies operating at the highest end of the value chain and producing high value added manufactured goods. To preserve and develop its role as a vital and dynamic industrial location, industry must be capable of maintaining high value-added production and must ensure it is capable of adapting to more rapidly evolving technological developments.

Given the country's high dependence on exports, international competitiveness is particularly important to Germany and its standard of living. Yet, if German industry has been able to seize opportunities, it still needs to tackle some challenges. In particular, rising electricity costs pose a growing challenge to Germany's export-based economy, especially because energy-intensive industries deliver a large proportion of the value added in the German manufacturing sector. The country faces important choices about the pace of renewable development that will have a significant impact on economic growth and Germany's ability to remain competitive in the global economy.



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