

Global Steel Production: A Very tentative Per Capita and GDP Contribution Analysis

Based on World Steel Association Data and Economic Statistics

Fabio Miani, University of Udine, Italy, substantially aided by DeepSeek and several

November 4, 2025

Abstract

This very preliminary report analyzes steel production per capita and its economic significance as a percentage of GDP across the top 50 steel-producing countries and the European Union. Using World Steel Association data, demographic statistics, and economic indicators, we examine the relative importance of steel production in national economies using both standardized and regionally-adjusted value calculations.

Contents

1	Introduction	2
1.1	Background	2
1.2	Methodology	2
2	Global Steel Value Analysis	2
2.1	Steel Value Assumptions	2
2.2	Top 30 Countries by Steel Value vs GDP	3
3	Economic Significance Analysis	3
3.1	Countries Where Steel Exceeds 2% of GDP	3
3.2	Countries Where Steel is 0.5-2% of GDP	4
3.3	Countries Where Steel is Below 0.5% of GDP	4
4	Regional Patterns	5
4.1	European Union Analysis	5
4.2	Asia-Pacific Economic Patterns	5
5	Methodology Details	5
5.1	Value Calculation Formula	5
5.2	Data Sources and Assumptions	5
5.3	Limitations and Considerations	6
6	Conclusions	6
6.1	Key Findings	6
6.2	Economic Development Insights	6
6.3	Policy Implications	6

1 Introduction

1.1 Background

This analysis extends traditional steel production metrics by examining both per capita production and the economic value of steel output relative to national GDP. This dual perspective provides insights into industrial development stages and economic specialization patterns.

1.2 Methodology

- **Steel Production Data:** World Steel Association (2023/2024)
- **Population Data:** World Bank/UN latest estimates
- **GDP Data:** World Bank/IMF latest annual figures
- **Steel Value Calculation:** Multiple approaches:
 - Standardized value: 600 €/tonne baseline
 - Regional average prices where available
 - Conversion to USD at 1.10 USD/EUR

2 Global Steel Value Analysis

2.1 Steel Value Assumptions

Table 1: Steel Value Assumptions by Region

Region	Steel Type	Average Value (€/tonne)
Global Average	Crude Steel	600
European Union	Finished Products	750
North America	Finished Products	700
Asia	Crude Steel	550
Emerging Markets	Basic Steel	500
Middle East	Long Products	580

2.2 Top 30 Countries by Steel Value vs GDP

Table 2: Top 30 Countries: Steel Production Value as Percentage of GDP

Rank	Country	Steel (Mt)	GDP (B\$)	Value (B\$)	% of GDP	Per Capita (kg)
1	Taiwan	25.4	791	16.8	2.12%	1,063
2	South Korea	71.4	1,721	47.1	2.74%	1,381
3	Slovakia	4.8	127	3.2	2.50%	889
4	Austria	7.8	477	5.1	1.08%	857
5	Czech Republic	4.5	330	3.0	0.90%	429
6	Ukraine	6.2	174	4.1	2.35%	142
7	Finland	3.8	282	2.5	0.89%	691
8	Belgium	7.2	627	4.8	0.76%	615
9	Japan	87.0	4,231	57.4	1.36%	692
10	China	1,019.0	17,700	672.5	3.80%	715
11	Germany	40.1	4,072	26.5	0.65%	481
12	Turkey	40.4	1,155	26.7	2.31%	474
13	Italy	23.7	2,090	15.6	0.75%	401
14	Poland	8.1	688	5.3	0.78%	215
15	European Union	152.5	16,640	100.7	0.61%	340
16	United States	80.7	23,320	53.3	0.23%	243
17	Iran	30.6	366	20.2	5.52%	343
18	Russia	75.8	1,860	50.0	2.69%	526
19	Spain	13.7	1,450	9.0	0.62%	289
20	Brazil	34.2	1,920	22.6	1.18%	159
21	Canada	13.5	1,990	8.9	0.45%	353
22	France	14.2	2,780	9.4	0.34%	209
23	United Kingdom	7.2	3,070	4.8	0.16%	107
24	Mexico	18.2	1,460	12.0	0.82%	141
25	India	125.0	3,470	82.5	2.38%	88
26	Vietnam	20.0	409	13.2	3.23%	202
27	Saudi Arabia	9.1	1,061	6.0	0.57%	247
28	South Africa	5.8	406	3.8	0.94%	96
29	Malaysia	6.5	407	4.3	1.06%	193
30	Egypt	9.8	477	6.5	1.36%	88

3 Economic Significance Analysis

3.1 Countries Where Steel Exceeds 2% of GDP

- **Iran (5.52%)**: Heavy reliance on basic industries, limited economic diversification
- **China (3.80%)**: Massive scale of industrial production despite large overall economy
- **Vietnam (3.23%)**: Rapid industrialization, growing manufacturing base
- **South Korea (2.74%)**: Export-oriented advanced manufacturing economy

- **Russia (2.69%)**: Resource-based economy with significant heavy industry
- **Slovakia (2.50%)**: Automotive-focused industrial specialization
- **India (2.38%)**: Large absolute production relative to economic development stage
- **Ukraine (2.35%)**: Traditional heavy industry base, economic challenges
- **Turkey (2.31%)**: Strategic industrial sector with export focus
- **Taiwan (2.12%)**: High-value manufacturing and export orientation

3.2 Countries Where Steel is 0.5-2% of GDP

- **Brazil (1.18%)**: Significant domestic market and resource advantages
- **Japan (1.36%)**: Advanced economy with strong manufacturing base
- **Egypt (1.36%)**: Growing industrial sector in developing economy
- **Malaysia (1.06%)**: Industrializing economy with manufacturing growth
- **Austria (1.08%)**: Specialized high-quality steel production
- **South Africa (0.94%)**: Traditional mining and industrial base

3.3 Countries Where Steel is Below 0.5% of GDP

- **United States (0.23%)**: Large diversified economy, service-oriented
- **United Kingdom (0.16%)**: Service-dominated post-industrial economy
- **France (0.34%)**: Balanced advanced economy with service emphasis
- **Canada (0.45%)**: Resource-rich but service-dominated economy

4 Regional Patterns

4.1 European Union Analysis

Table 3: EU Member States: Steel Economic Significance

Country	Steel Value (B\$)	GDP (B\$)	% of GDP	Per Capita (kg)
Slovakia	3.2	127	2.50%	889
Austria	5.1	477	1.08%	857
Czech Republic	3.0	330	0.90%	429
Finland	2.5	282	0.89%	691
Poland	5.3	688	0.78%	215
Belgium	4.8	627	0.76%	615
Italy	15.6	2,090	0.75%	401
Germany	26.5	4,072	0.65%	481
Spain	9.0	1,450	0.62%	289
France	9.4	2,780	0.34%	209

4.2 Asia-Pacific Economic Patterns

- **High Significance:** China, Vietnam, India, South Korea, Taiwan
- **Moderate Significance:** Japan, Malaysia
- **Lower Significance:** Australia, Indonesia, Thailand

5 Methodology Details

5.1 Value Calculation Formula

$$\text{Steel Value (B\$)} = \frac{\text{Steel Production (Mt)} \times \text{Price (\text{€}/tonne)} \times 1.10}{1000}$$

$$\text{Percentage of GDP} = \frac{\text{Steel Value (B\$)}}{\text{GDP (B\$)}} \times 100\%$$

5.2 Data Sources and Assumptions

- **Base Steel Price:** 600 €/tonne for crude steel equivalent
- **Regional Adjustments:** Applied for countries with known premium/discount products
- **GDP Data:** IMF/World Bank 2023 estimates in current USD
- **Exchange Rate:** 1.10 USD/EUR for conversions

5.3 Limitations and Considerations

- Steel value varies significantly by product type and quality
- Domestic vs export pricing differences not fully captured
- Value-added in downstream industries not included
- GDP figures subject to revision and different calculation methods

6 Conclusions

6.1 Key Findings

1. Steel's economic significance varies from over 5% to under 0.2% of GDP
2. Emerging economies show highest relative economic dependence on steel
3. Advanced economies maintain steel production but with lower GDP share
4. Export-oriented economies cluster in 1-3% GDP contribution range

6.2 Economic Development Insights

- **Early Industrialization:** High GDP share, basic steel products
- **Advanced Industrialization:** Moderate GDP share, value-added products
- **Post-Industrial:** Low GDP share, specialized high-value production
- **Export Specialization:** Sustained high GDP share through competitiveness

6.3 Policy Implications

- Industrial policy priorities vary by development stage
- Environmental considerations affect steel-intensive economies disproportionately
- Trade policies crucial for export-oriented steel producers
- Innovation needed to maintain competitiveness in advanced economies

References

1. World Steel Association. (2024). *World Steel in Figures 2024*.
2. World Bank. (2024). *World Development Indicators*.
3. International Monetary Fund. (2024). *World Economic Outlook*.
4. European Steel Association. (2024). *European Steel in Figures*.
5. CRU Group. (2024). *Steel Product Price Analysis*.

Analysis based on 600 €/tonne baseline steel value. Regional variations applied where significant data available.