Design of Machines and Structures, Vol. 15, No. 2 (2025), pp. 23–27.
https://doi.org/10.32972/dms.2025.010

ANALYSING THE RELATIONSHIP BETWEEN ADDITIVE MANUFACTURING MARKET AND GDP

PÉTER FICZERE

Budapest University of Technology and Economics,
Department of Railway Vehicles and Vehicle System Analysis,
1111, Budapest, Műegyetem rkp. 3
ficzere.peter@kjk.bme.hu
https://orcid.org/0000-0003-3207-5501

Abstract: This paper investigates the correlation between the additive manufacturing (AM) market and gross domestic product (GDP) in different regions around the world. Using data from Grand View Research (https://www.grandviewresearch.com) and the World Bank (https://data.worldbank.org), market trends, economic indicators and regional disparities were analysed. The study provides visualisations and tabular data to support the analysis, offering insights into the economic impact of AM technologies.

Keywords: *Additive Manufacturing, GDP, market, regional development*

1. INTRODUCTION

Additive Manufacturing (AM), more commonly known as 3D printing, has emerged as a transformative technology in a variety of industries. Its market growth is influenced by economic factors, particularly GDP. The economic investigation of Additive Manufacturing is more often (Alzyod, Ficzere, & Borbas, 2024) (Dömötör, 2023) (Ficzere, 2022) (Ficzere, Borbás, & Török, 2013) (Makkai & Sarka, 2023). This paper explores the relationship between regional GDP and the size of the AM market, demonstrating how economic strength correlates with the adoption of technology.

2. METHODOLOGY

Regional GDP data were collected from the World Bank and AM market size estimates from Grand View Research, both for the year 2025. The data was analysed using correlation techniques and visualised it through scatter plots and bar charts. The regions considered were North America, Europe, the Asia-Pacific region, Latin America, and the Middle East and Africa together.

3. DATA ANALYSIS AND RESULTS

Table 1 shows the GDP and AM market size by region for 2025. The diagram shown in Figure 1 represents the relationship between the GDP and AM market size by region. It is obvious, that where the GDP is lower, there is less money for such an expensive technology, so the AM market will be low as well. But the diagram of the Figure 1 shows visually how significant the difference between the market of those countries that have got a high GDP and those markets where the GDP is humble.

Table 1

The GDP and AM market size by region for 2025

Region	GDP (USD Trillion)	AM Market Size (USD Billion)
North America	28.0	25.0
Europe	23.0	20.0
Asia Pacific	35.0	30.0
Latin America	5.0	5.0
Middle East & Africa	4.0	3.0

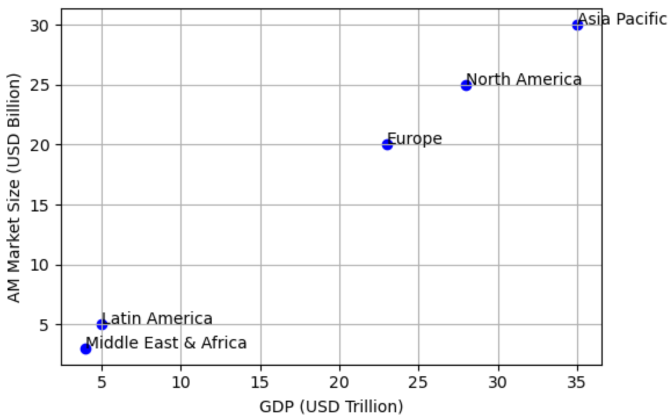

Figure 1. *Scatter plot showing the relationship between GDP and AM market size by region*

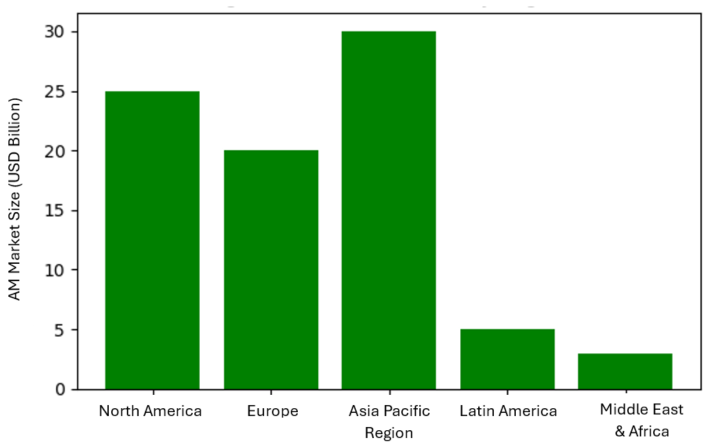

Figure 2. *Bar chart comparing AM market size across regions*

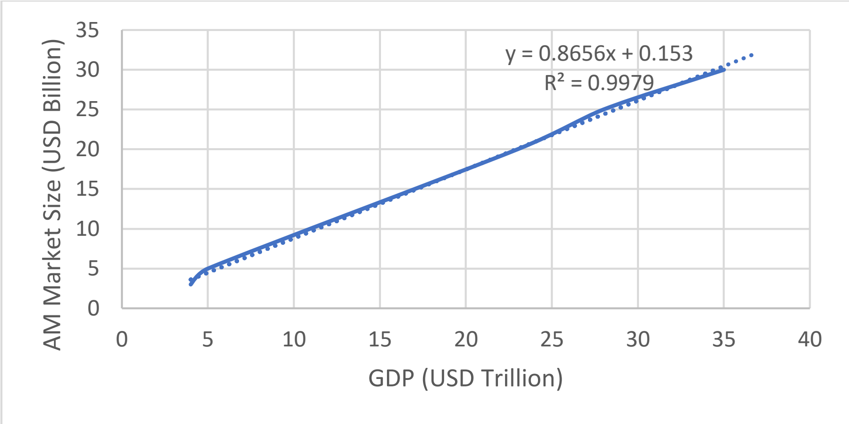

Figure 3. *AM market in the function of GDP*

When the AM market is represented in a diagram as a function of GDP as in Figure 3, it is easy to see that there is a linear relationship between the two.

This paper explores the relationship between global Gross Domestic Product (GDP) and the Additive Manufacturing (AM) market from 2015 to 2025. It analyses trends, resilience during the COVID-19 pandemic, and the strategic importance of AM in modern economies. This study uses publicly available data from the World Bank for global GDP figures and Grand View Research for AM market size estimates. Trends are visualised and analysed over the 2015–2025 period, with special attention to the impact of COVID-19 pandemic.

Table 2

Global GDP and AM market from 2015

Year	Global GDP (Trillion USD)	AM Market Size (Billion USD)
2015	74.9	5.1
2016	77.3	6.0
2017	80.2	7.2
2018	84.0	8.8
2019	87.6	10.5
2020	84.7	12.0
2021	89.6	15.0
2022	94.9	20.4
2023	99.5	26.7
2024	104.2	34.9
2025	109.0	44.5

4. Discussion

The analysis reveals a positive correlation between a GDP of a region and the size of its AM market. Regions with a higher GDP, such as the Asia-Pacific region and North America, also have larger AM markets. This suggests that economic capacity plays a significant role in the adoption and growth of AM technologies. However, the data also highlights regional disparities, with Latin America and the Middle East and Africa having smaller markets.

Figure 4 illustrates the trends in global GDP and AM market size from 2015 to 2025. The red shaded area highlights the COVID-19 pandemic period (2020–2021). The chart reveals significant differences in trends between GDP and the AM market during the pandemic. While global GDP declined sharply in 2020 due to economic shutdowns, the AM market continued to grow. This resilience is due to AM's decentralised production capabilities and digital workflows, as well as its critical role in emergency manufacturing, such as the production of medical equipment. The pandemic accelerated innovation and adoption of AM in sectors such as healthcare and aerospace.

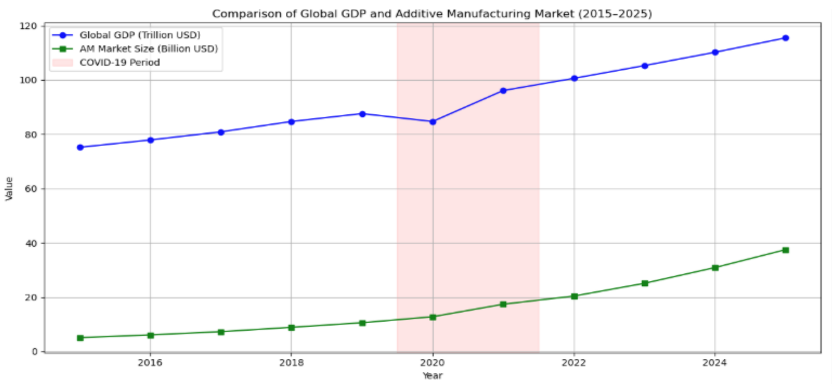

Figure 4. *AM market and Global GDP from 2015*

The additive manufacturing market has demonstrated robust growth, independent of broader economic fluctuations. Its performance during the pandemic highlights its strategic importance in future manufacturing ecosystems. Continued investment and policy support could further strengthen its role in promoting global economic resilience.

References

Alzyod, H., Ficzere, P., & Borbas, L. (2024). Cost-efficient additive manufacturing: Unraveling the economic dynamics of material Extrusion (MEX) technology. *International Review*, (3–4), 185–196. https://doi.org/10.5937/intrev2404185A

Dömötör, C. (2023). Reconstruction of simple parts using FDM technology. *Design of Machines and Structures*, 13 (2), 13–21. https://doi.org/10.32972/dms.2023.013

Ficzere, P. (2022). The Impact of the Positioning of Parts on the Variable Production Costs in the Case of Additive Manufacturing. *Periodica Polytechnica Transportation Engineering*, 50 (3), 304–308. https://doi.org/10.3311/PPtr.15827

Ficzere, P., Borbás, L., & Török, Á. (2013). Economical investigation of rapid prototyping. *International Journal for Traffic and Transport Engineering*, 3 (3), 344–350. https://doi.org/10.7708/ijtte.2013.3(3).09

Makkai, T., & Sarka, F. (2023). CAD modelling of a milling insert. *Design of Machines and Structures*, 13 (2), 81–92. https://doi.org/10.32972/dms.2023.019