

# The Impact of the Startup Ecosystem on Economic Growth in Germany

# Introduction



# Introduction

In the heart of Europe, **Germany's economic prowess**—rooted in established industries and technological strength—is now augmented by a **dynamic startup ecosystem**. This report delves into their interplay and the startups' influence on **GDP growth and job creation**.

With **venture capital** flourishing, it has become integral to economic strategy, supporting innovation and entrepreneurship. This presentation explores venture capital's role as both a catalyst and metric of economic vitality, revealing its impact on the German economy's pulse.

# Methods & Data Sources

## Datasource 1: Germany Combined GDP (1960-2022)

- Data URL : <https://api.worldbank.org/v2/en/indicator/NY.GDP.MKTP.KD.ZG?downloadformat=excel>
- Data Type: Excel

## Datasource 2: Germany Business Startups (2003-2022)

- Data URL: [https://www.destatis.de/DE/Themen/Branchen-Unternehmen/Unternehmen/\\_Grafik/\\_Interaktiv/Daten/betriebsgruendungen-ingesamt.csv?\\_\\_blob=value](https://www.destatis.de/DE/Themen/Branchen-Unternehmen/Unternehmen/_Grafik/_Interaktiv/Daten/betriebsgruendungen-ingesamt.csv?__blob=value)
- Data Type: CSV

## Datasource 3: German Employment Growth by Industries (1992-2022)

- Data URL: [https://www.destatis.de/DE/Themen/Arbeit/Arbeitsmarkt/\\_Grafik/\\_Interaktiv/Daten/erwerbstaetigkeit-wz-bereiche-jahr.csv?\\_\\_blob=value](https://www.destatis.de/DE/Themen/Arbeit/Arbeitsmarkt/_Grafik/_Interaktiv/Daten/erwerbstaetigkeit-wz-bereiche-jahr.csv?__blob=value)
- Data Type: CSV

## Datasource 4: Venture Capital Investments in Germany(2002-2022)

- Data URL: [https://stats.oecd.org/restsdmx/sdmx.ashx/GetData/VC\\_INVEST/DEU.VC\\_INV.VC\\_T+SEED+START+LATER.USD\\_V+SH\\_GDP/all?startTime=2002&endTime=2022](https://stats.oecd.org/restsdmx/sdmx.ashx/GetData/VC_INVEST/DEU.VC_INV.VC_T+SEED+START+LATER.USD_V+SH_GDP/all?startTime=2002&endTime=2022)
- Data Type: XML

The process involved automated data extraction from formats like Excel, CSV, and XML, and transformations including column renaming and data type standardization. Data was then efficiently managed in a SQLite database, addressing any challenges in consistency and quality.



### Used Technologies :

- Git , Github , Python with Jupyter notebook
- Python Standard Libraries: os, io, xml, sqlite3, StringIO, unittest.
- Third-party Libraries: sklearn, requests, sqlalchemy, MinMaxScaler, CSV, pyexcel\_ods, pandas, seaborn, numpy, matplotlib.

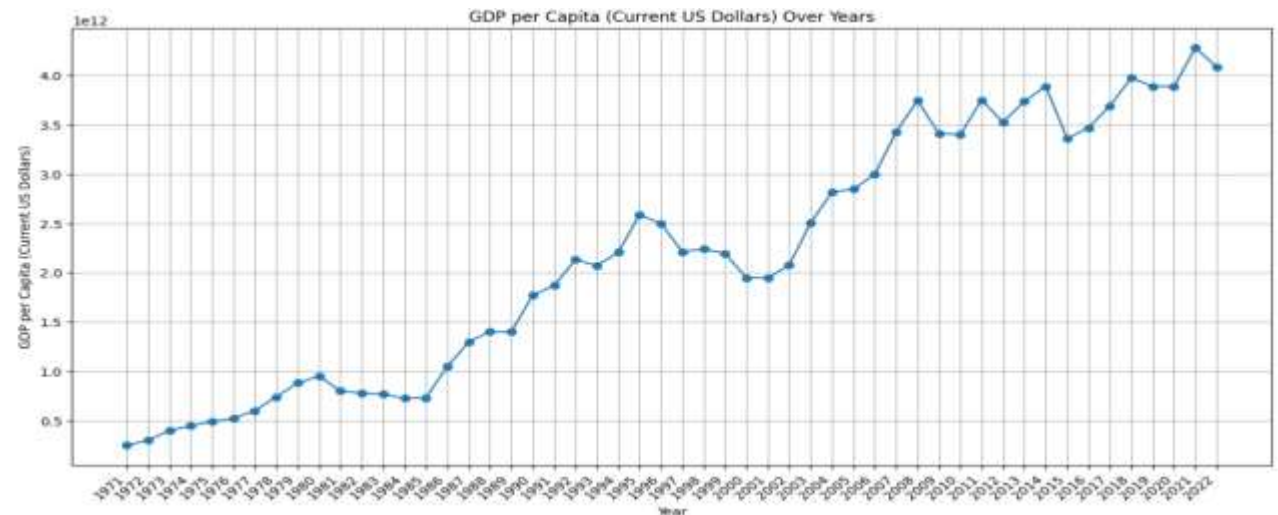
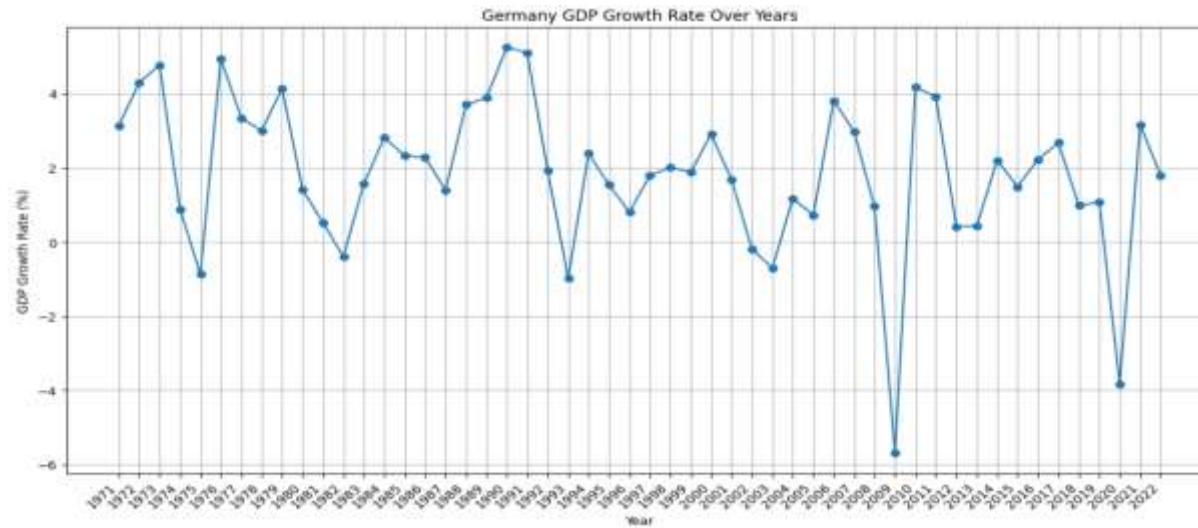
### Components :

- project-plan.md: Used for project planning with GitHub's issues feature.
- pipeline.py : A pipeline to load and store the needed data in a database.
- test.py : Contains unit and system tests for functionality robustness.
- exploration.ipynb: Explores and assesses dataset suitability.
- report.ipynb: Presents the outcomes of the project
- test.sh , pipeline.sh : Used as an entry point for the CI-Pipeline (realized with GitHub-Action).

# Results & Analysis

# Economic Indicators

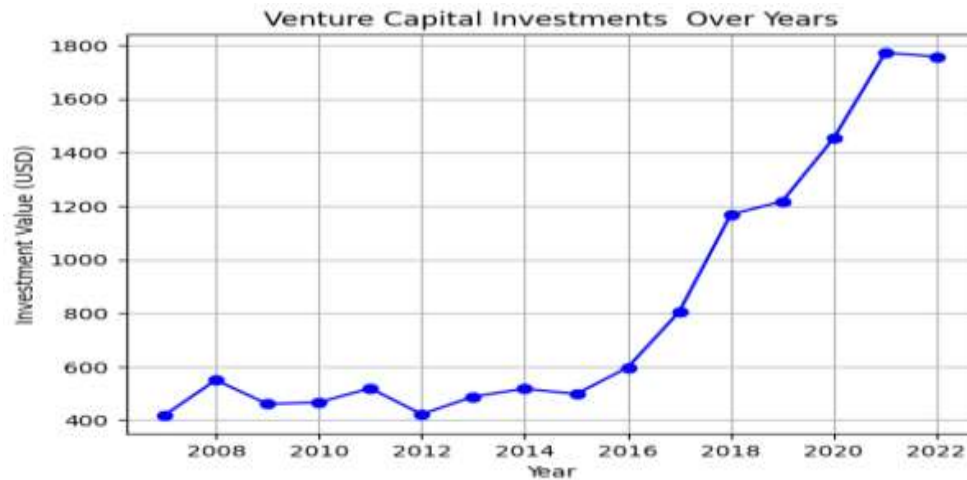
## Germany GDP Impact





# Economic Indicators

## Startup Ecosystem , Venture Capital Investment

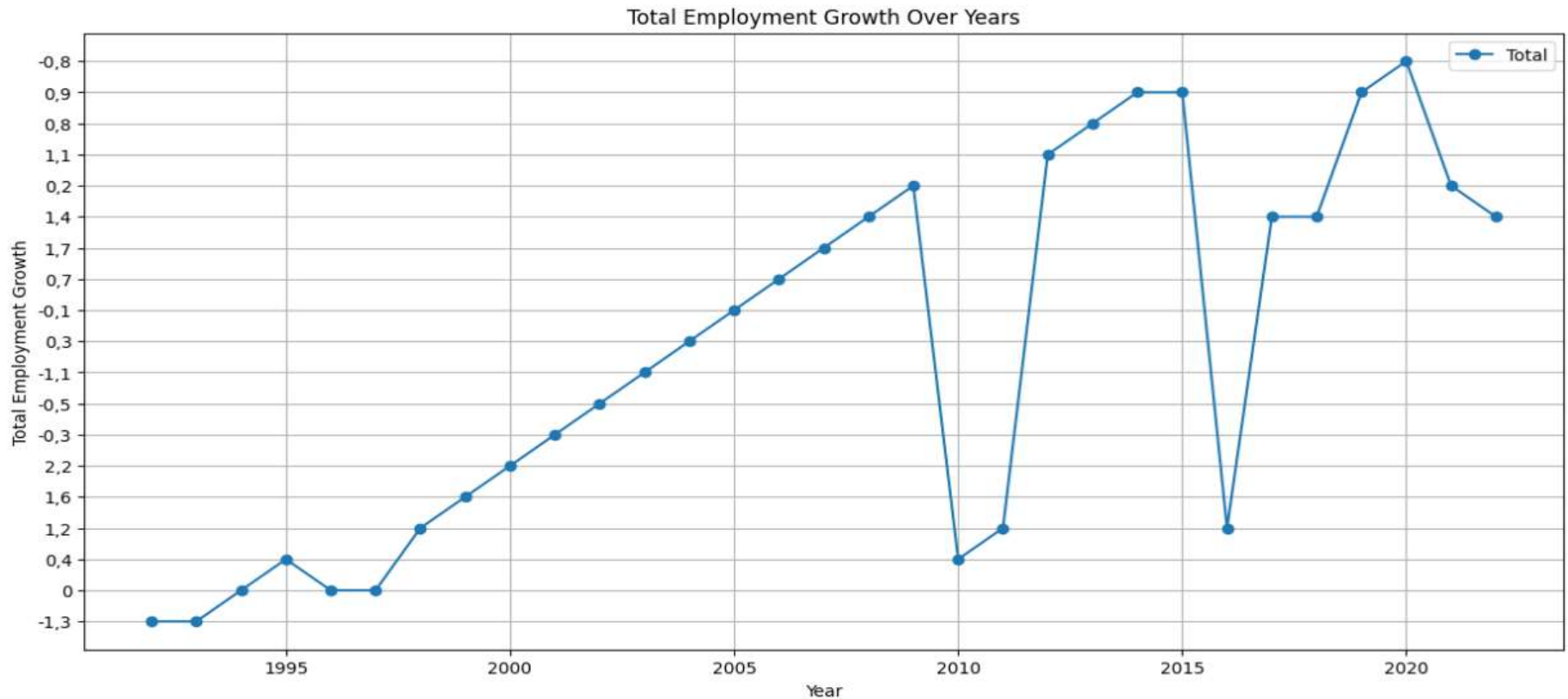


# Job Creation Impact

## Employment Growth



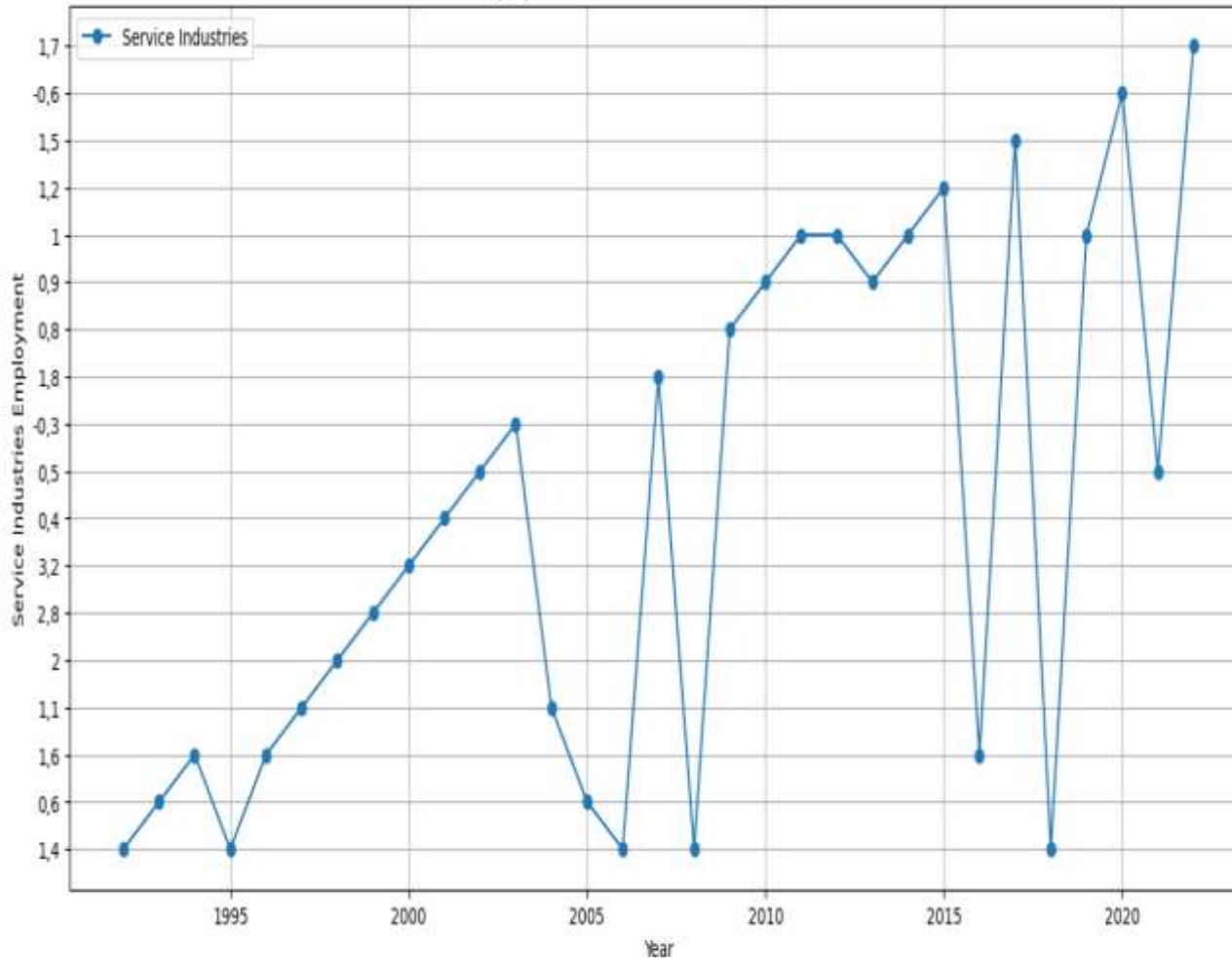
There's an overall upward trend in employment growth, with some fluctuations. Notably, there's a sharp dip around 2005, a significant peak around 2011, and another sharp dip around 2015, followed by a rapid recovery.



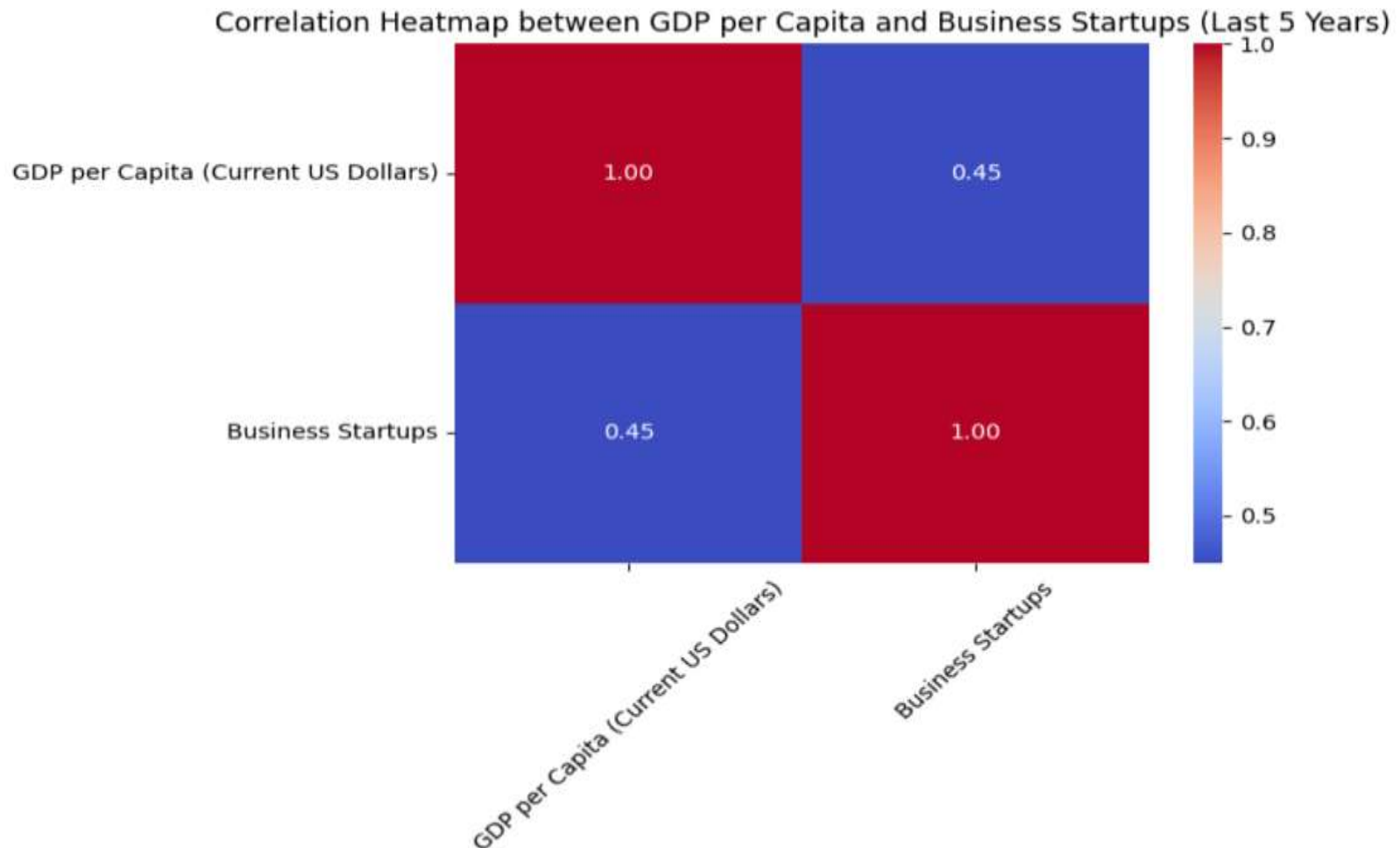
# Job Creation Impact

## Service Industry : A Case Study

Employment of Service Industries Over Years



Examining the service sector employment trends after looking at the overall job growth shows a sector that's not just growing but also fluctuating with the economy's ups and downs.



# Conclusion & Limitations

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- **German Startup Ecosystem:** A significant driver of economic growth and job creation.
  - **Positive Correlation:** Data shows startups likely contribute to economic prosperity, with a notable relationship between GDP per capita and startup activity.
  - **Venture Capital as an Enabler:** Identified as a crucial component supporting startup success and overall economic health.
  - **Policy Implications:** Essential for policy initiatives to continue fostering the startup environment, supporting Germany's economic vitality and employment.



- **Scope of Economic Factors:** Not all influencing economic elements may have been considered.
- **Economic Volatility:** Rapid changes in economic trends could impact the analysis and future outcomes.
- **Recommendations for Future Research:**
  - Incorporate a broader range of economic factors.
  - Longitudinal analysis to track the evolution of these relationships over time.
  - Aimed at crafting nuanced policies to nurture the startup ecosystem and sustain economic growth.

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<https://github.com/lyndanajjar/made-template/tree/main/project>

**Thank you for your attention !**