Karlsruhe Institute of Technology

Institute for Economics (ECON)
Chair of Economic Policy
Prof. Dr. Ingrid Ott

Evaluating the changing environment of the Diesel Automotive Sector: A Case Study of Bosch

Alexander Saure

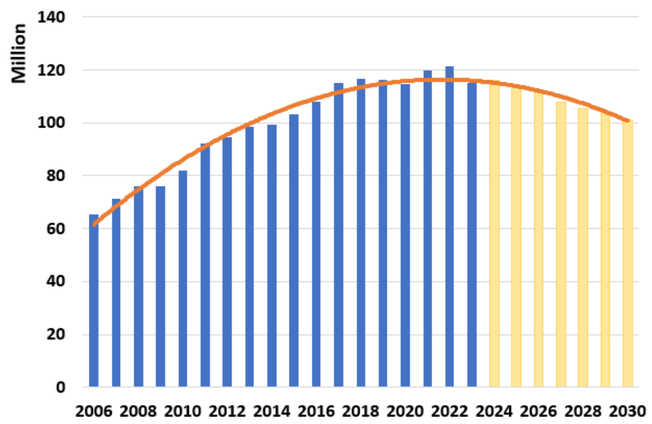
Motivation

- Diesel vehicles represent a central focus of current policy regulations, thereby subjecting the market to significant transformation.[1]
- With an estimated worldwide trade volume ranking 4th, the automotive aftermarket industry plays a substantial role in global economic development.[2]
- The paucity of research results in a lack of clarity on the key factors influencing the diesel aftermarket, even among companies within this sector.

Research questions

1. Which are the most important factors influencing the sales development of the diesel aftermarket?
2. What is the extent of the role played by green patents?
3. Does the passage of time impact on the effectiveness of green patents?

Diesel vehicles in use in the EU[3]



- Diesel vehicles in use are projected to decline in the future.
- Policy regulations and situational occurrences such as Dieselgate negatively influence diesel car usage.[4]

Model specifics

Due to overdispersion in the sales data, the negative binomial regression model was utilized.

It uses panel data from 2006 till 2021 to determine the degree of impact of various variables on diesel spare part sales in the european market.

To ensure the robustness of the results, various variable combinations were tried out and dependencies between dependent variables removed.

Model results

Independent variables	Impact on independent Variable	Significance level
Diesel vehicle fleet	0.3922	***
Green patents lagged by 2	0.2156	*
Green patents lagged by 10	0.0354	**
GDP	-0.4189	*
Workshop infrastructure	0.9602	***
Passenger car usage	5.7561	**
Environmental taxes	0.0318	

- **Dependent variable:**
  Quantity of diesel spare part sales
- **Interpretation:**
  1% increase in the dependent variable is indicative of a proportional increase in the coefficient for the independent variable.

Significance levels: *p < 0.05
**p < 0.01
***p < 0.005

Interpretation

- Vehicle fleet size shows a strong impact on spare part sales as it defines the framework of the customer base.
- Patents drive new products and can hinder competition from entering the market.
- As time passes, the impact of patents lessens.
- Patents older than ten years could harm spare part sales if a company is complacent with their technology or a competitor possesses crucial technology for advancements.
- Workshop infrastructure, therefore a service concept, influences company-specific sales as a secondary factor.
- Passenger car usage crucially impacts on the exchange rate of parts, therefore essential for spare part sales.

Conclusion

- Vehicles in use and car usage are the most direct influences for sales development in the automotive aftermarket.
- Green patents enhance sales initially, but could hinder future innovations.
- A deeper comprehension of the market may be achieved through an examination of the interrelationships between market factors.

Alexander Saure
October 2024
Karlsruhe

References
1. Coman, I. M. (2021)
2. Türkbayrağí et al. (2022)
3. Robert Bosch GmbH (2024)
4. Töller, A. E. (2021)

Examiner: Prof. Dr. Ingrid Ott
Second Examiner: Prof. Dr. Orestis Terzidis
Supervisor: Narek Mirzoyan
Time period: 08.07.2024 – 23.09.2024