

Impact of Fraunhofer Research

India is one of the third most attractive investment destination for technology transactions and one of the largest start-up ecosystems in the world. As India consistently marches ahead on its journey towards sustainable development and towards achieving its aspiration to become a USD 5 trillion economy, it requires a strong emphasis on strengthening the Nation's ecosystem of Research, Innovation and Technology development. The recent pandemic crises provided a compelling opportunity for Research institutions, Academia, and Industry to work in unison and collaboration. The synergy developed would be instrumental in leveraging and catapulting India towards a technology led growth which is enshrined in sustainability.

Germany being India's largest European trading partner, drives the success story of both countries in the Small and Medium Enterprises (SMEs). There is still a vast potential for collaboration and a continuous knowledge exchange. However, the opportunities evolving out of it have not yet fully been tapped. Intermediary aggregators such as chambers, industry associations and public service providers in this regard can act as important linkages to foster Indo-German exchange and experience sharing.

Applied research at the Fraunhofer-Gesellschaft powers the innovative capability of companies and promotes Germany's status as a place for doing business. Fraunhofer-Gesellschaft can contribute by demonstrably increase the business success of cooperating companies in India while strengthening Germany's standing as a preferred business location that fosters innovation.

1. Fraunhofer innovations measurably strengthen the German economy's competitiveness and the performance of the German innovation system

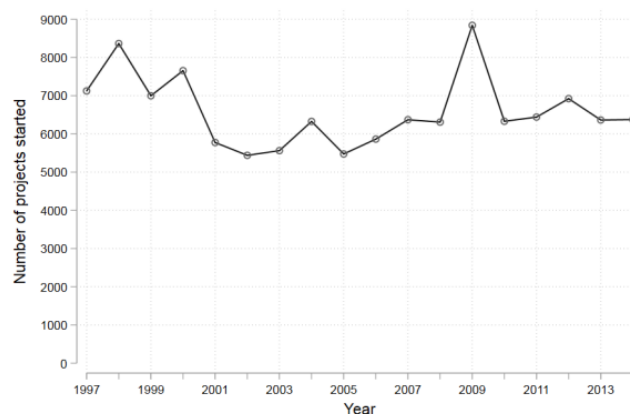


Figure 1: Projects started by year

With the application of theoretical technology cycles to real technology developments Fraunhofer demonstrates its ability to guide technologies through phases of "sobering" and re-orientation (valley of death) with its continuous research efforts. For technology such as laser technology in production processes, material sciences, and renewable energy, Fraunhofer has significantly contributed to the international competitiveness of German industry as well as to Germany's reputation as an innovative business location.

2. Companies that collaborate with Fraunhofer are more innovative and successful

Compared to companies that do not cooperate with Fraunhofer, the companies that do are more likely to launch new products with a probability that is 10.2 percentage points higher. In the case

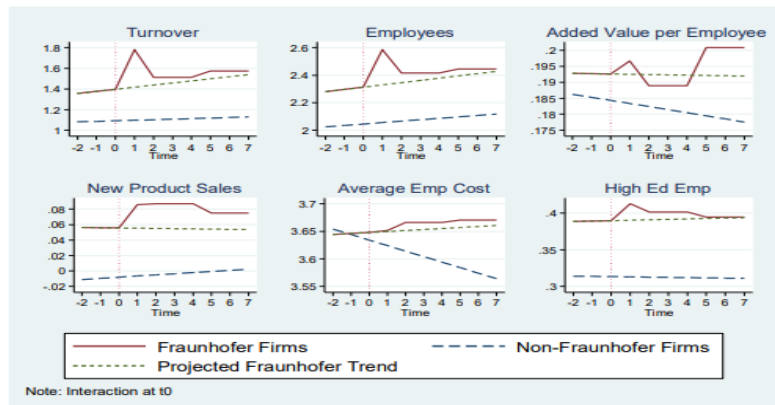


Figure 5: Interaction with FhG over time: Graphical illustration

of completely new product categories, this effect is even more pronounced at 13.2%. More than 80% of the 215 SME customers surveyed would collaborate with Fraunhofer again and recommend Fraunhofer to others.

3. Fraunhofer boosts the financial success of companies

A one percent increase in expenses for projects with Fraunhofer leads to an increase in sales growth of 1.3 percentage points and an increase in productivity

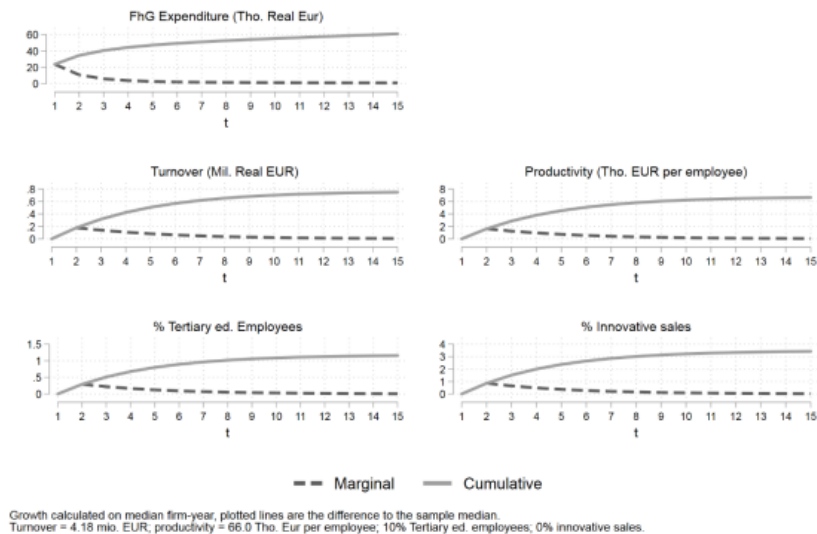


Figure 5: Long-term impacts

growth of 0.8 percentage points. Extrapolated to the German economy, this means that doubling the Fraunhofer industrial budget would increase the productivity of the German economy by 0.55%.

In addition to conducting contracted research for industry, Fraunhofer institutes also collaborate with companies in consortium research projects. After completion of joint research projects, many companies opt to continue working with Fraunhofer. Fraunhofer receives an average of three follow-up contracts within five years from companies with which it has collaborated in consortium research projects.

4. Investments in applied research at Fraunhofer have positive effects on Germany's economic strength and increase tax revenues on the national, state, and municipal level

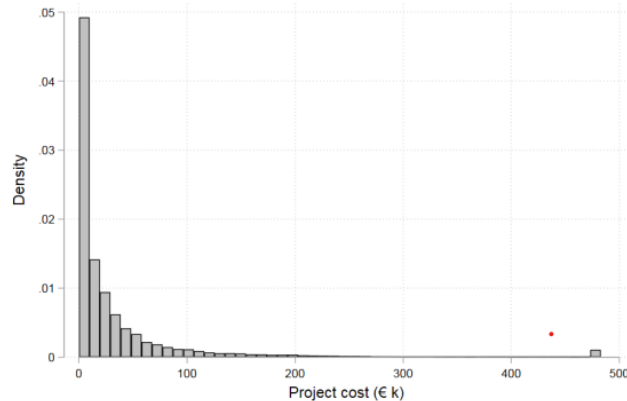


Figure 2: Distribution of project costs

Notes: Data have been censored at the 99th percentile (482 €k). The true maximum is higher than 150 €m. 0.98% of projects report negative revenue, these have been set at 0. 26.55% of projects report no revenue.

The monetary effects on gross domestic product linked to Fraunhofer exceed Fraunhofer's project revenues 18-fold. This means that for every euro of public funding spent on the Fraunhofer-Gesellschaft, the nation, individual states, and municipalities receive four euros back in the form of higher tax revenues.

Conclusion:

Fraunhofer's contribution is significantly more than just its core activities of application-oriented research and technology transfer. Additional Fraunhofer activities within the German scientific and innovation system consist of SME support, training and teaching, the application of international knowledge, and helping German industry to tap into international markets.

Right from the early stages of a technology's development, Fraunhofer builds up expertise and resources to implement mature technologies at the right time in conjunction with industry. This requires, even in difficult times, farsightedness in terms of research topics and their continuity.

The Fraunhofer funding model - with one third coming from institutional funding, industrial earnings, and public contracts, respectively - has also proved to be ideal for pre-competitive research. Fraunhofer interactions are not just a means for gaining access to unique and complementary knowledge sources. Instead, they also change the fundamental strategies by which companies produce, innovate, create value, and ultimately prosper. What makes Fraunhofer successful is not its formal overarching structure, but its many years of technical, economical, scientific, and collaborative experience rooted in its individual institutes.