KMU FORSCHUNG

Preliminary evaluation of the ‘investment programme for modernising production in the vehicle manufacturing and vehicle supply industry’

2021 funding guideline

registered under SA.62787 (2021/EV)

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About the study

This study was conducted on behalf of

Federal Ministry for Economic Affairs and Climate Action, Berlin

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1 | Objectives and brief description of the aid scheme

In response to the economic impact of the COVID-19 pandemic, the federal government introduced the Economic Stimulus Package 35c, which included a new funding initiative for "forward-looking investments by vehicle manufacturers and their suppliers" (BMWK, 2021). This initiative, which became operational at the end of March 2021, aims to modernise production processes within the vehicle manufacturing and supply sector.

The vehicle industry is undergoing a significant transformation, driven by advances in digital technology, automation and Industry 4.0 frameworks, including autonomous driving and the development of connected value networks, notably GAIA-X. At the same time, the industry is moving towards more sustainable production techniques, vehicle electrification and innovative mobility solutions in line with climate targets to reduce greenhouse gas emissions. These two transformative forces are driving the industry to address deep and far-reaching structural challenges.

The investment programme has the objective of modernising and digitising the manufacturing landscape in the vehicle industry. The aid scheme is designed to promote investments by companies within the vehicle industry (especially vehicle suppliers and SMEs) in new manufacturing equipment, industry-4.0-ready equipment, digitalisation and environmental sustainability in the manufacturing process, and related investments in consultancy services and training measures. This in turn should facilitate its transformation and mitigate the negative effects of these structural changes.

Eligible undertakings are undertakings in the vehicle industry with a prominent role for small and medium-sized enterprises (SMEs). The vehicle industry within the meaning of the support measure includes all types of ground-based vehicles with civilian (non-military) use, in particular cars, commercial vehicles and motorcycles, mobile work and agricultural machinery, railway and rail vehicles, bicycles and e-bikes/pedelecs. In addition, companies outside the vehicle industry - if there is evidence of significant links to the vehicle and supply industry - are also eligible to apply.

The funding guideline (BMWK, 2021) started in March 2021 and was originally intended to run until June 2024, but was discontinued in November 2023 (BMWK, 2023). No new applications were accepted from October 2022.

Depending on the type of project, various funding areas were targeted:

- Investment in the expansion and optimisation of production facilities and processes (e.g. acquisition of machines and equipment including the software and hardware required for their operation).
- Related investments to develop the capabilities of the company (e.g. through project-related consultancy services, staff training and adjustment measures).

Applications are processed in the order in which they are received. A grant decision can only be made after the application has been completed. Applications are evaluated according to the following criteria and a simplified single stage approval procedure:

- Content: Relevance to the funding objectives and funding purpose of this funding guideline as stated in the investment programme
- Timing: according to the receipt of applications
- Financial: according to the availability of budget funds

The grant funding is provided in accordance with European state aid regulations, i.e. the General Block Exemption Regulation (GBER) (EU, 2021) or the Federal Small Grants Regulation 2020. Consequently, the funding rate and the funding amount were defined differently, with the former ranging from 10% to 50% and the latter from 20% to 50% of eligible expenditure. One of the conditions for funding under the

Federal Small Grants Regulation 2020 (BMWi, 2020) was the submission of evidence demonstrating a decline in turnover of at least 15% in the previous year.

The scheme was implemented and monitored by the Federal Office for Economic Affairs and Export Control (BAFA). Between 2021 and 2023, 533 projects with a funding volume of €203 million were approved under the funding programme (source: profi-database, accessed on 12.01.2024). The typical duration of the projects is one year, with the option of a twelve-months extension at no additional cost.

In the case of funding provided on the basis of the GBER, the aid intensity per recipient may not exceed the following rates:

- Investments in the expansion and optimisation of manufacturing facilities and processes
  - Investments in innovative and digital production technologies based on Article 17 GBER:
    - 20% of eligible expenses for small businesses
    - 10% of eligible expenses for medium-sized businesses
  - Investments in technologies and processes to improve environmental sustainability, energy and resource efficiency, and circular economy based on Article 38 GBER:
    - 30% of eligible (additional) expenses
    - In addition, small and medium-sized enterprises can receive an additional bonus of 10 percentage points on eligible expenses.
- Related investments for developing corporate capabilities based on Article 18 GBER:
    - 50% of eligible expenses

Alternatively, the applicant may opt for funding under the Federal Small Grants Regulation 2020 as described above. In this case, the maximum funding rates and aid intensities defined in the funding guidelines applies. The maximum funding amount when applying the Federal Small Grants Regulation 2020 is EUR 1,800,000 per company (including subsidiaries):

- 50% of eligible expenses for investments up to EUR 400,000
- 40% of eligible expenses for investments up to EUR 1,200,000
- 30% of eligible expenses for investments up to EUR 3,500,000
- 20% of eligible expenses for investments up to EUR 9,000,000

The contract for the evaluation was awarded to a consortium comprising the Austrian Institute for SME Research (KMU Forschung Austria) and Kerlen Evaluation in December 2023. The evaluation design is scheduled for implementation in 2024 and will conclude in 2027.

2 | Evaluation questions and result indicators

The evaluation addresses the following questions and indicators, as shown in Table 1 Objectives, evaluation questions and indicators below, which is based on the notified evaluation plan.

Table 1 Objectives, evaluation questions and indicators

Objectives	Evaluation questions	Result dimension	Result indicators
Technological leadership and economic sustainability	Has the scheme contributed to the relevant policy objective? Has the programme as a whole boosted the innovative strength and the technological leadership role? What effect on job security did the scheme exert?	Competitiveness	Global position of the industry; economic significance of identified impacts; evolution of number of employees
Investment in new machinery and equipment	Was it possible to achieve an initial effect? Have companies with low investments levels increased their investment expenditure?	Positive economic impacts	Investment expenditure
Investment in digitalisation	Do the funded projects result in increased investment in the area of digitalisation? Do investment in digitalisation expenditures differ between funded and comparable non-funded enterprises?	Positive economic impacts	Investment expenditure in digitalisation
Investment in environmental sustainability of production	Do the funded projects result in increased investment in the area of sustainable production? Do investment in sustainable production expenditures differ between funded and comparable non-funded enterprises?	Positive environmental impacts	Investment expenditure in sustainable production; CO2 reduction
Process innovation	Do the funded projects result in increased investment in the area of process innovation? Do investments in process innovation differ between funded and comparable non-funded enterprises? What influence did the funding have on the introduction of process innovations in the company? What costs could be saved through process innovations?	Positive economic impacts	Investment expenditure in process innovation; Innovation output (product and process innovations); *(dep. on data quality: efficiency and flexibility in production, flexibility of supply chains and production networks)*
Identification of indirect effects	Has the scheme had positive spill-over effects on the activity of other firms? What negative indirect effects (if any) did occur during promotion and are there any special features?	Positive or negative economic impacts	Investment expenditure in digitalisation; Innovation output; *(dep. on data quality: commercialisation of new technologies and production methods, use of digital technologies to optimise inter- and intra-company collaboration, knowledge transfer, evolution of employee skills, provision of consultancy services)*

Proportionality and appropriateness	Was the investment programme proportionate to the problem being addressed? Could the same effects have been obtained with less aid or a different form of aid? Was the most effective aid instrument chosen? Would other aid instruments or types of intervention, including non-aid options, have been more appropriate for achieving the objective in question? Is there a need to redefine the objectives and/or the target beneficiaries to achieve the same policy objectives?	Adequacy and efficacy	Qualitative assessment; number of projects and funding volume

3 | Data

The company and project-specific data of the funded companies are provided by the respective project management agency (BAFA). In addition to basic company information such as name, address, sector and turnover, project-specific information such as duration and funding amount is also recorded. In addition, the beneficiaries are obliged to provide all data required for the performance review and evaluation in compliance with data protection regulations and to participate in surveys, interviews and other data collection activities planned by the granting authority as part of the performance review and evaluation.

In addition, data from the funding catalogue of completed and ongoing federal project funding is used. This makes it possible to identify companies that have received other federal funding (in particular BMBF and other BMWK funding).

To be able to carry out the control group comparisons envisaged in the evaluation plan, information on non-funded companies is also required. For this purpose, the Mannheim Innovation Panel (MIP) and 'additional databases' are mentioned in the evaluation plan, by which the Federal Company Data for Germany (AFiD) is the natural choice.

The MIP is a panel survey of legally independent companies with at least five employees in the manufacturing industry and business-related services that has been conducted annually since 1993. It enables extrapolations to be made for the entire German economy and various industry groups. The survey covers between 6,000 and 7,000 companies each year in the written survey and supplements this with a further 4,000 to 6,000 telephone interviews for a comprehensive non-response analysis. The MIP provides information on the introduction of new products, services and processes in companies. It sheds light on innovation expenditure and the success that companies achieve with new products, services, property right applications and improved processes. The survey also provides insights into the factors that promote or hinder companies' future investments in R&D. The MIP data are available with a delay of about 16 months after the end of the survey.

The dataset, although included in the evaluation plan, is not suitable for assessing investment in manufacturing processes and machinery because its variables do not adequately cover the topic of interest. This assessment is supported by Christian Rammer, one of the experts responsible for the ZEW dataset. As a result, the dataset does not provide the necessary insights and data points for a comprehensive evaluation in these specific areas. For this reason, we will mainly use the second data source mentioned in the evaluation plan, the AFiD panel of industrial companies.

The AFiD industrial companies panel contains information on companies in the manufacturing, mining and quarrying sectors in Germany. The following surveys are linked:

- The annual survey of manufacturing and mining and quarrying enterprises,
- data from the annual investment survey for manufacturing, mining and quarrying enterprises, and

- the cost structure survey in the manufacturing, mining and quarrying sector (KSE).

The data are collected by the Federal Statistical Office and provided by the Research Data Centre (FDZ) of the Federal and State Statistical Offices. The linking of the AFiD panels with external data is carried out by the Federal Statistical Office, for which the commercial register number can be used.

The data set from the AFiD industrial companies panel includes the following information, among others:

- Economic sector
- Number of employees, including R&D employees
- Turnover
- Investments, including R&D investments
- Wages and salaries
- Cost structures

The survey makes it possible to analyse the development of gross fixed capital formation as a whole as well as differentiated by the investment categories 'machinery, equipment, fixtures and fittings' and 'intangible assets' (concessions, patents, licences, trademarks, etc.). Another advantage of the data set is that it covers all enterprises in Germany with 20 or more employees, so that the variables for the treatment group do not have to be collected separately in a survey.

In addition, the AFiD energy use module complements the AFiD industrial establishments panel. It contains information on energy consumption and procurement by energy source, own electricity generation and energy intensity of manufacturing and mining and quarrying enterprises in Germany. The energy data at establishment level can be linked to enterprises by aggregating the data of individual establishments to enterprise data. This can also be done at the Federal Statistical Office.

4 | Methodology

The core element of the implementation of the notified evaluation plan for the funding guideline "Investment Programme for the Modernisation of Production in the Vehicle Manufacturing and Supply Industry" (A1) is an impact assessment using a control group comparison. An overview over the objectives, evaluation questions and corresponding methods of analyses is presented in Table 2 below.

Table 2 Objectives, evaluation questions and corresponding methods

Objectives	Evaluation questions	Result dimension	Methods
Technological leadership and economic sustainability	Has the scheme contributed to the relevant policy objective? Has the programme as a whole boosted the innovative strength and the technological leadership role? What effect on job security did the scheme exert?	Competitiveness	Econometric analysis, survey, interviews, case studies, programme data analysis
Investment in new machinery and equipment	Was it possible to achieve an initial effect? Have companies with low investments levels increased their investment expenditure?	Positive economic impacts	Econometric analysis
Investment in digitalisation	Do the funded projects result in increased investment in the area of digitalisation? Do investment in digitalisation expenditures differ between funded and comparable non-funded enterprises?	Positive economic impacts	Econometric analysis, survey, interviews

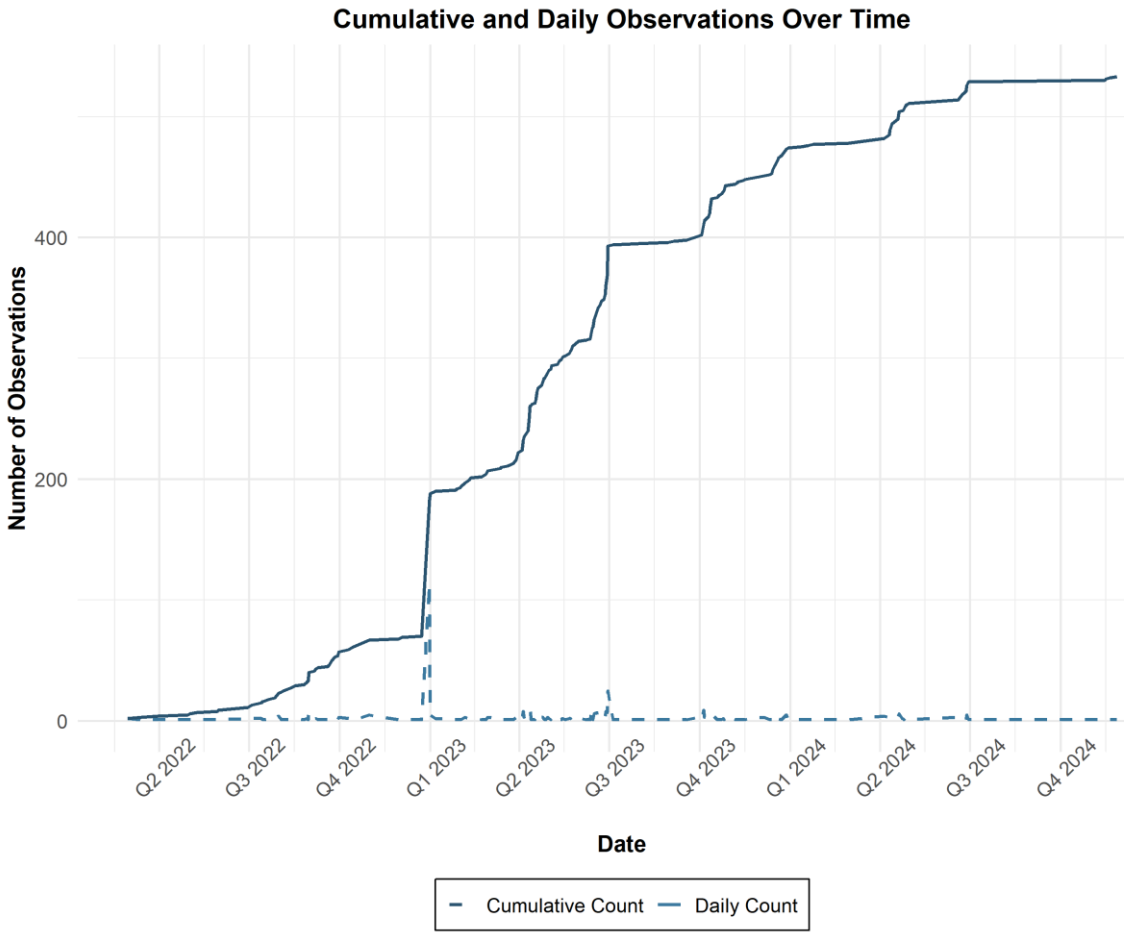
Investment in environmental sustainability of production	Do the funded projects result in increased investment in the area of sustainable production? Do investment in sustainable production expenditures differ between funded and comparable non-funded enterprises?	Positive environmental impacts	Econometric analysis, survey, interviews
Process innovation	Do the funded projects result in increased investment in the area of process innovation? Do investments in process innovation differ between funded and comparable non-funded enterprises? What influence did the funding have on the introduction of process innovations in the company? What costs could be saved through process innovations?	Positive economic impacts	Econometric analysis, survey, interviews
Identification of indirect effects	Has the scheme had positive spill-over effects on the activity of other firms? What negative indirect effects (if any) did occur during promotion and are there any special features?	Positive or negative economic impacts	Econometric analysis, survey, interviews, semi-qualitative spillover analysis
Proportionality and appropriateness	Was the investment programme proportionate to the problem being addressed? Could the same effects have been obtained with less aid or a different form of aid? Was the most effective aid instrument chosen? Would other aid instruments or types of intervention, including non-aid options, have been more appropriate for achieving the objective in question? Is there a need to redefine the objectives and/or the target beneficiaries to achieve the same policy objectives?	Adequacy and efficacy	Econometric analysis, survey, interviews, case studies, programme data analysis

The notified evaluation plan cannot be implemented in its current form due to inaccurate time estimates made in the evaluation plan. In this first evaluation report, we describe how the evaluation plan can be carried out at a later date, as well as the results of the descriptive data analysis to date.

The econometric analysis envisaged in the evaluation plan can only be implemented in the second evaluation report by June 2027, because there are only few impact observations available by the submission deadline of the present report (see Figure 1). The average duration of funding for A1 projects is 479 days or around 16 months. The first projects started at the beginning of 2021; with an average duration of 16 months, the first projects were completed in April 2022 (de facto 5% of the projects). Immediate effects can therefore be seen in the secondary data for 2022 and short-term effects in the secondary data for 2023 and 2024. For the AFiD panel of industrial enterprises, the delay between the end of the reference year and the publication of the data is 18-24 months. This means that the direct impact of the subsidy can only be analysed by the end of 2026.

For this reason, the proposed report on the econometric assessments of the evaluation plan will not be presented until the end of June 2027. This date was already foreseen in the evaluation plan for an additional report to capture 'the full effects of the investment programme'.

Figure 1 Project finalisation over time



Source: Own analysis of funding database; n=533 projects

Econometric analysis

As recommended in the evaluation plan, a conditional difference-in-differences (cDiD) approach will be used to analyse the effectiveness of the funding programme. To ensure the basic assumption of the DiD approach is met - that subsidized and non-subsidized enterprises would have developed similarly without funding - only non-subsidized enterprises that closely resemble the subsidized ones in key characteristics are included in the control group for the analysis. These firms are selected using a matching procedure.

In the cDiD approach[1], the difference between the target variables before and after the intervention is calculated for the intervention and control groups. The difference (i.e. the difference in the change over time between the intervention and control groups) is then calculated from these two differences. For the selection and weighting of the enterprises in the control group, the cDiD method uses a priori a statistical matching procedure. Ideally, for each subsidised firm, one or more non-subsidised firms are identified that are similar to the subsidised firm in terms of observable characteristics. An empirically widespread form is propensity score matching (PSM), in which subsidised and non-subsidised firms are not matched on the basis of individual characteristics, but rather on the basis of an index between 0 and 1. This empirically estimated index indicates the probability of a firm being subsidised on the basis of

[1] Panel regressions with fixed company and time effects as well as event studies are also subsumed under this method, as these represent special cases of DiD.

observed characteristics. Other common matching methods include coarsened-exact matching, which focuses on exact matching for some characteristics (e.g. sector, region) and best possible matching for other, usually continuous characteristics (e.g. export ratio, employment size).[2] The appropriate matching method can only be determined once the final data set is available before the start of the analysis.

The main outcome indicators to be analysed for guideline A1 are investment expenditure, in particular in fixed assets and ICT, and energy consumption. A comparison of the development of market shares of subsidised and non-subsidised enterprises, as proposed in the evaluation plan, is expected to be a major challenge, since the most important companies partake in the funding programme. The possibility of building multiple control groups from other sectors or from other nations, particularly French and Spanish automotive industries, will be examined. Matching would (ideally) be carried out based on the level of capital investment, level of CO2 emissions, employment, labour productivity, sales and/or profit, investment expenditure pre-intervention, average age of machinery and fixed-capital investment.

Moreover, as noted in the evaluation plan, it is challenging to use control group comparisons for large companies such as OEMs and occasionally Tier 1 suppliers, as they are unique and difficult to compare with other companies. Therefore, as outlined in the evaluation plans, we plan to conduct online surveys and interviews to assess the impact on these companies.

Survey

The impact of the programmes will also be assessed through a standardised survey of beneficiaries to complement the other methodological applications. Two rounds of surveys are planned, the first in autumn 2024 and the second in 2027.

The results of the survey will be used to assess the direct impact and the achievement of the objectives of the support programme, as well as the impact between companies in different sectors and of different sizes. The study aims to determine the impact of the funding on the competitiveness of the beneficiary companies, in particular SMEs. It will also analyse whether jobs have been safeguarded or created and whether the funding has led to increased networking activities between companies and between companies and research institutions. In addition, indicators for process innovation for the econometric analysis are collected in the survey to avoid having to identify the subsidised companies in the secondary data and not being able to use the entire treatment group due to an incomplete representation of the company population. This is necessary as the sample size of the MIP is considerably smaller than that of the main secondary data source, the AFiD industrial companies panel. In addition, variables on indirect effects are included, in particular positive and negative spillovers.

Mixed-methods spillover analysis

According to Medhurst et al. (2014), spillovers from funding programmes can also be analysed through a semi-quantitative approach using a conceptual impact model and its empirical implementation through a survey combined with a principal component and cluster analysis. The results are then accompanied by interviews and/or a case study approach to explore the impact pathways in more detail. The impact models identify activities, outputs and outcomes that could potentially generate spillovers. On this basis, indicators of the extent of spillovers to different target groups are defined. To evaluate these indicators, it is necessary to identify areas that are considered particularly relevant for potential spillovers. Medhurst et al. (2014) identified seven broad areas to be specified and defined in the context of the measure: technology and innovation, market and industry structure, institutional framework, actors, relationships between actors, transmission channels and absorptive capacity.

[2] For more details on Coarsend-Excat Matching see Iacus, King and Porro (2012) and on Propensity Score Matching see Rosenbaum and Rubin (1985).

The indicators are integrated into an online survey of grantees and assessed for possible manifestations. Principal component analysis is employed to allocate the survey responses to the seven areas. When combined with variables characterising the project participants, a cluster analysis can be carried out to categorize the population and explore their potential for indirect effects. This approach allows concrete statements regarding the openness of a funding measure to different types of spillovers and fosters a comprehensive understanding of effects across programme lines and beyond the funding framework.

Interviews

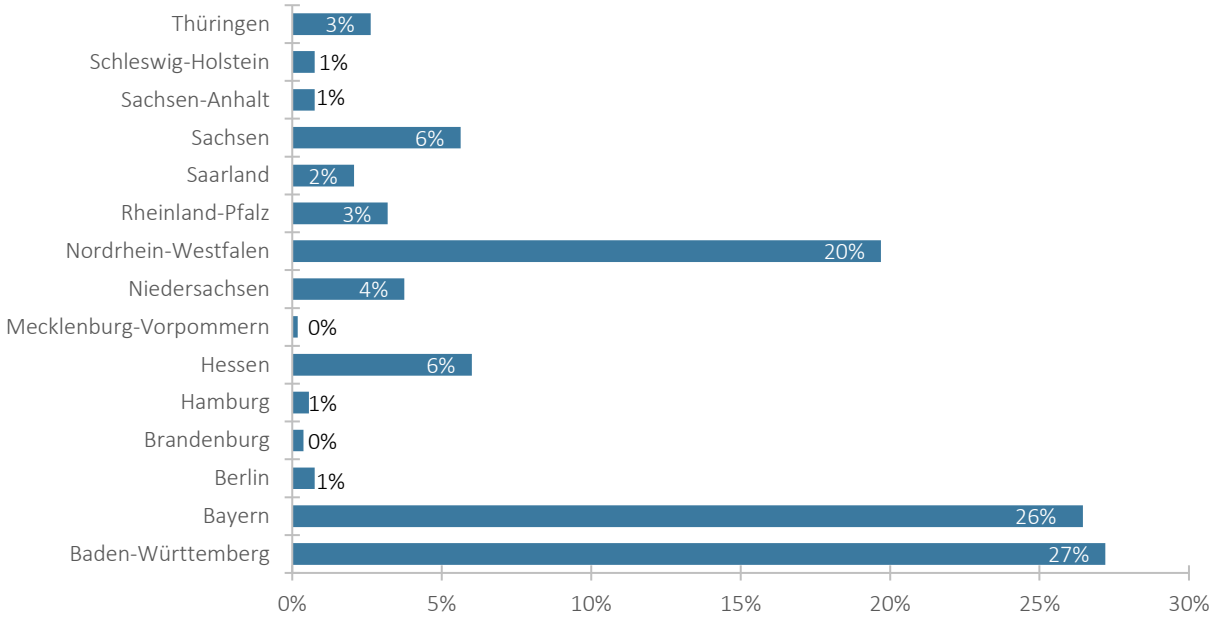
Semi-structured interviews will be conducted with grantees to gain in-depth insights into the causalities of the specific impact pathways. This will also validate findings from other analysis steps in the interest of methodological triangulation.

5 | Preliminary results

Number of supported projects

Under scheme A1, a total of 519 projects have been accepted for funding in 2021 and a further 14 projects in 2022 (see Figure 2). The vast majority of these 533 funded projects are located in the three production-heavy federal states of Baden-Württemberg (145 projects), Bayern (141) and Nordrhein-Westfalen (105), followed by Hessen (32), Sachsen (30), Niedersachsen (20) and Thüringen (14).

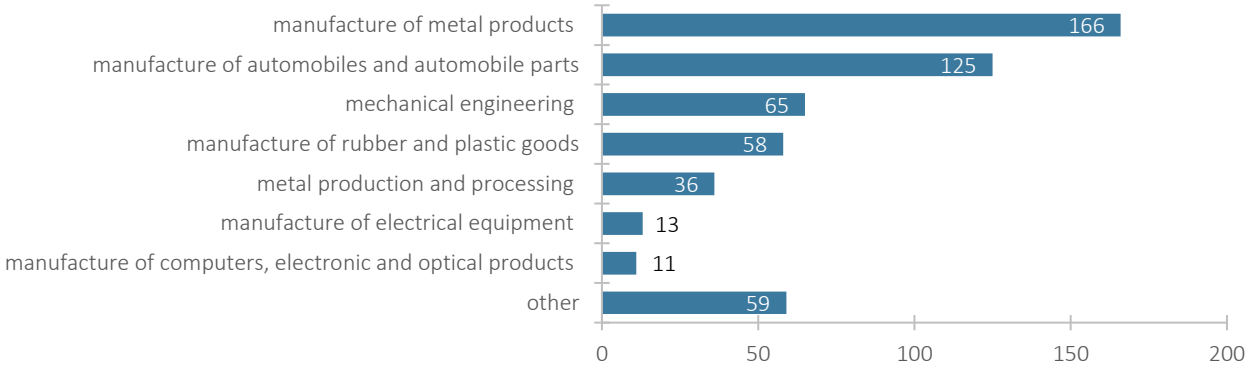
Figure 2 Regional distribution of projects



Source: Own analysis of funding database; n=533 projects.

The distribution of funded projects by sector (see Figure 3) is concentrated in the manufacture of metal products (166), manufacture of motor vehicles and parts (125), mechanical engineering (65), manufacture of rubber and plastic products (58), metal production and processing (36), manufacture of electrical equipment (13) and manufacture of computers, electronic and optical products (11). The 533 projects are located in 532 enterprises – only one enterprise has two projects (both starting in 2021), the others have one project each.

Figure 3 Projects in economic sectors

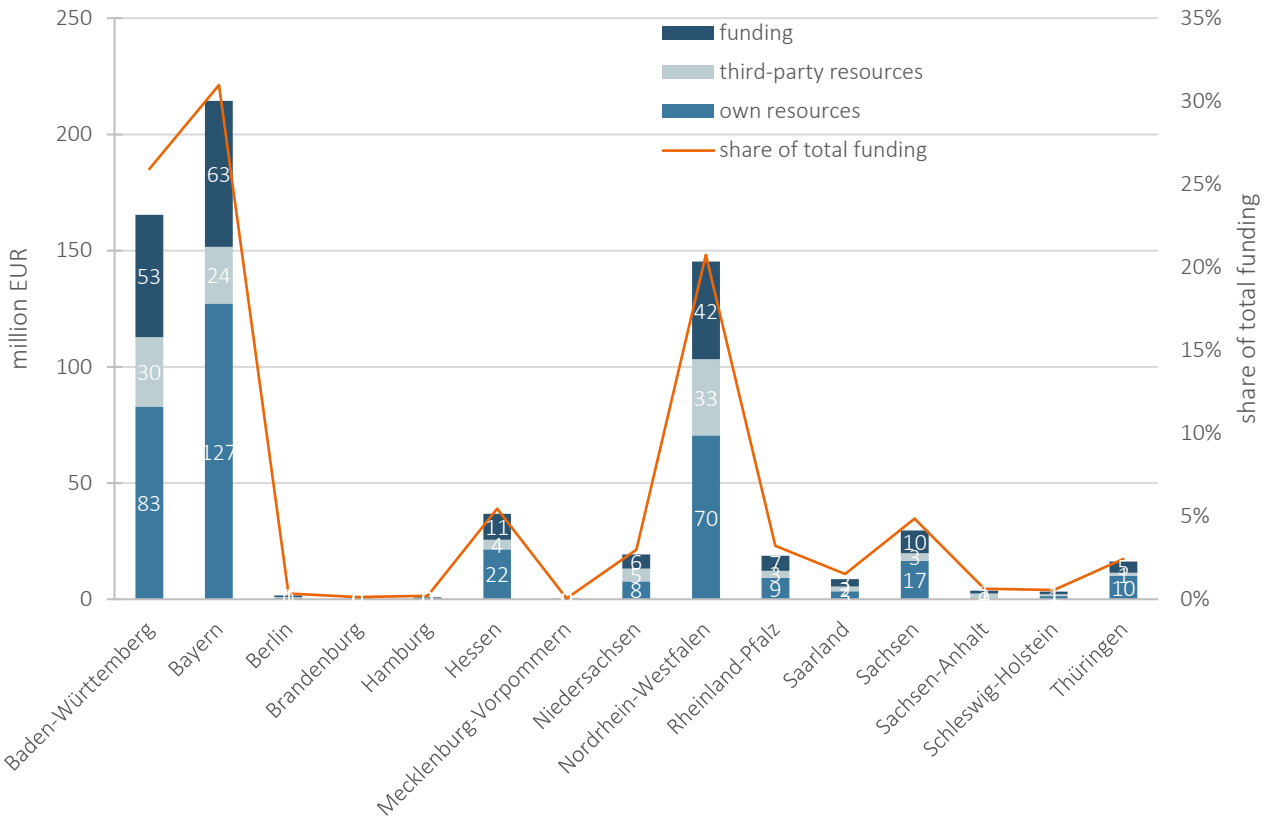


Source: Own analysis of funding database; n=533 projects.

Funding volume and total project volume

The bulk of the funding was awarded in 2021. Only €3.5 million were distributed in 2022, representing about 18% of the total volume of projects launched in that year (€19 million). The total volume of all funded projects amounts to roughly €665 million, €203 million of which stem from the funding scheme (31%). €110 million were third-party resources (17%) and €352 million own resources of the project partners (53%). Regarding project volumes and the amount of funding, there are significant regional differences according to the locations of the funded projects (see Figure 4). In Baden-Württemberg, the project volume amounts to €165 million, in Bayern €214 million and in Nordrhein-Westfalen €145 million, which together account for more than three quarters of the total project volume. This matches the regional distribution of the vehicle industries in German rather well. In most states (Länder), the regional share of total funding corresponds to the regional share of total project volume. However, in Baden-Württemberg, the share of funding in total funding is higher than the share of project volume in total project volume, while in Bayern the reverse is true. This divergence might be caused by the different compositions of implementing companies in the respective states: In Bayern, the proportion of projects carried out by large companies is higher than in Baden-Württemberg. For more information on company size see section “Company size and gender diversity” below.

Figure 4 Regional distribution of funding and project volume

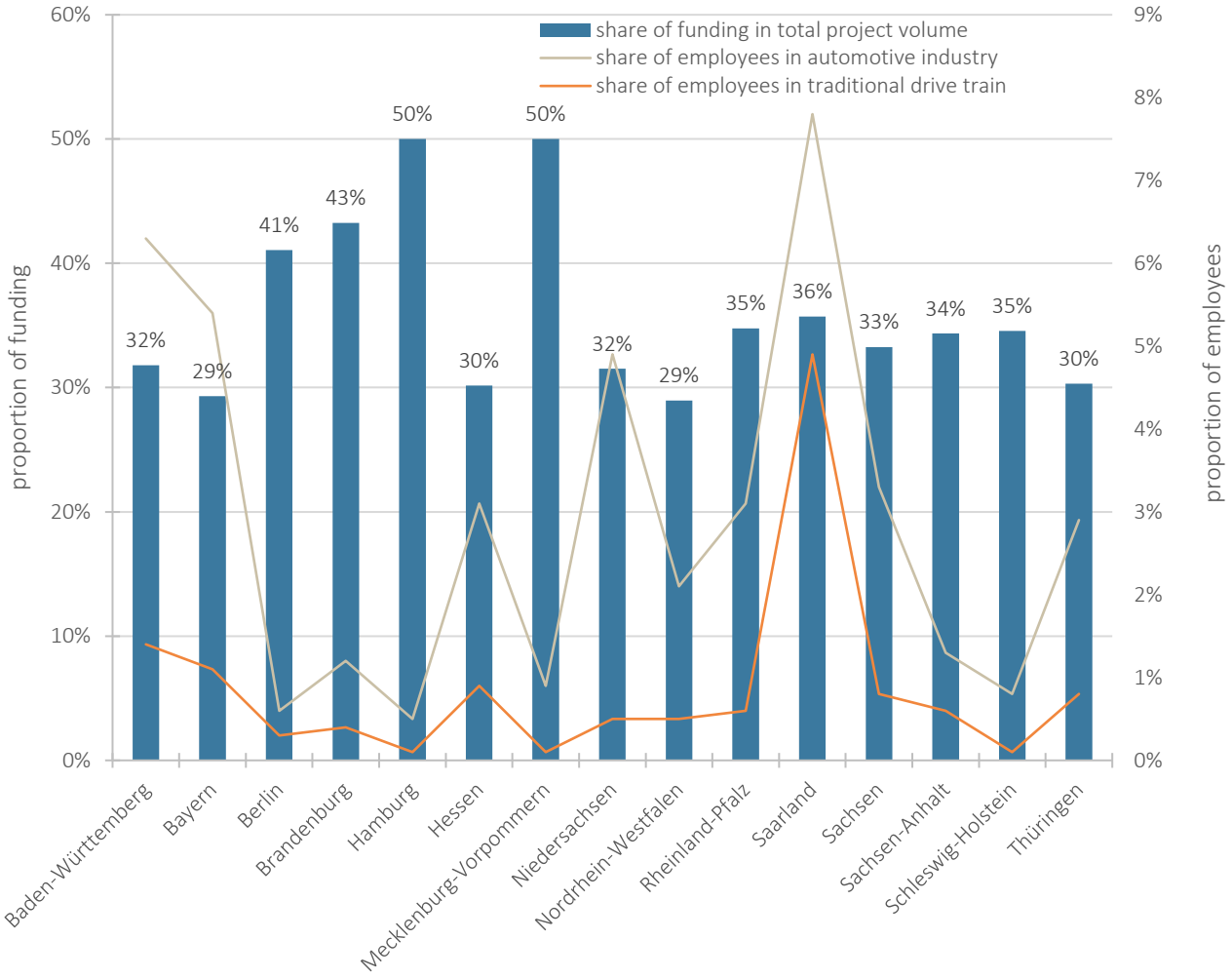


Source: Own analysis of funding database; n=533 projects.

In a regional comparison, between 29% and 50% of the total project volume comes from the scheme funding (see Figure 5). The share of funding in total project volume tends to be lower in states with high total project volumes, especially in Baden-Württemberg, Bayern and Nordrhein-Westfalen, but also in Hessen, Niedersachsen and Thüringen. The highest shares of funding in the total project volume are registered in states with low total project volume, particularly in Berlin, Brandenburg, Hamburg and Mecklenburg-Vorpommern.

The respective regional labour markets show different dependencies on the automotive industry in general and on traditional drivetrains (of internal combustion engines) in particular: the regional shares of employees in the automotive industry out of all employees are highest in the state of Saarland (8%), followed by Baden-Württemberg (6%), Bayern (5%) and Niedersachsen (5%). In the states of Sachsen, Hessen, Rheinland-Pfalz and Thüringen, each 3% of the workforce are employed the automotive industry. For Baden-Württemberg and Bayern, high shares of employment in the automotive industry are thus matched by high project volumes, while in Nordrhein-Westfalen, the third state with high project volumes, only 2% of employees are employed in the automotive industry. On the contrary, the high shares of employees in the automotive industry in Saarland (the second smallest German state in terms of population) and Niedersachsen meet only small total project volume and middle-ground funding shares. The share of employees in production of the traditional drivetrain is again highest in Saarland (5%), followed by Baden-Württemberg, Bayern, Hessen, Sachsen and Thüringen (1% each).

Figure 5 Regional distribution of share of employees in the automotive industry, share in traditional drivetrain, and share of funding in total project volume

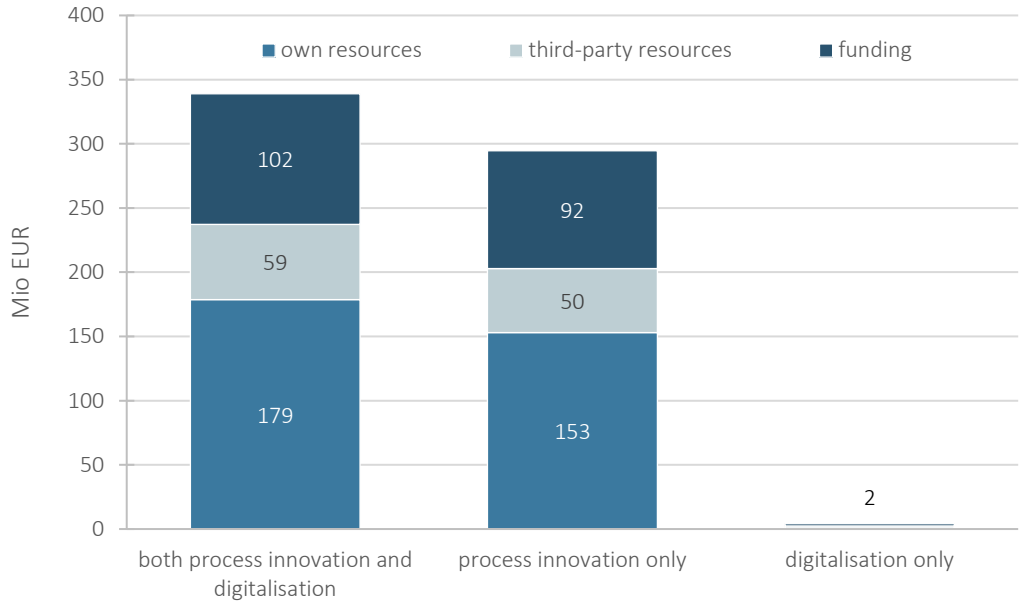


Source: Own analysis of funding database; n=533 projects. Shares of employees in automotive industry and in traditional drivetrain from BMWi (2021).

Thematic focus of projects

Figure 6 gives an overview over the two main objectives of the funding scheme, enhanced digitalisation and process innovation. 259 projects (51% of all) pursue both process innovation and digitalisation as development with a total project volume of €339 million, 30% of which is from the subsidy programme. Process innovation without simultaneous digitalisation is the focus of 236 projects (44% of all). These have a total volume of €294 million, of which 31% is federal funding. Only six projects pursue digitalisation objectives without a simultaneous focus on process innovation. The total volume of these projects is €4 million, half of which comes from the funding scheme.

Figure 6 Composition of total project volume per thematic focus



Source: Own analysis of funding database; n=533 projects. EUR are rounded.

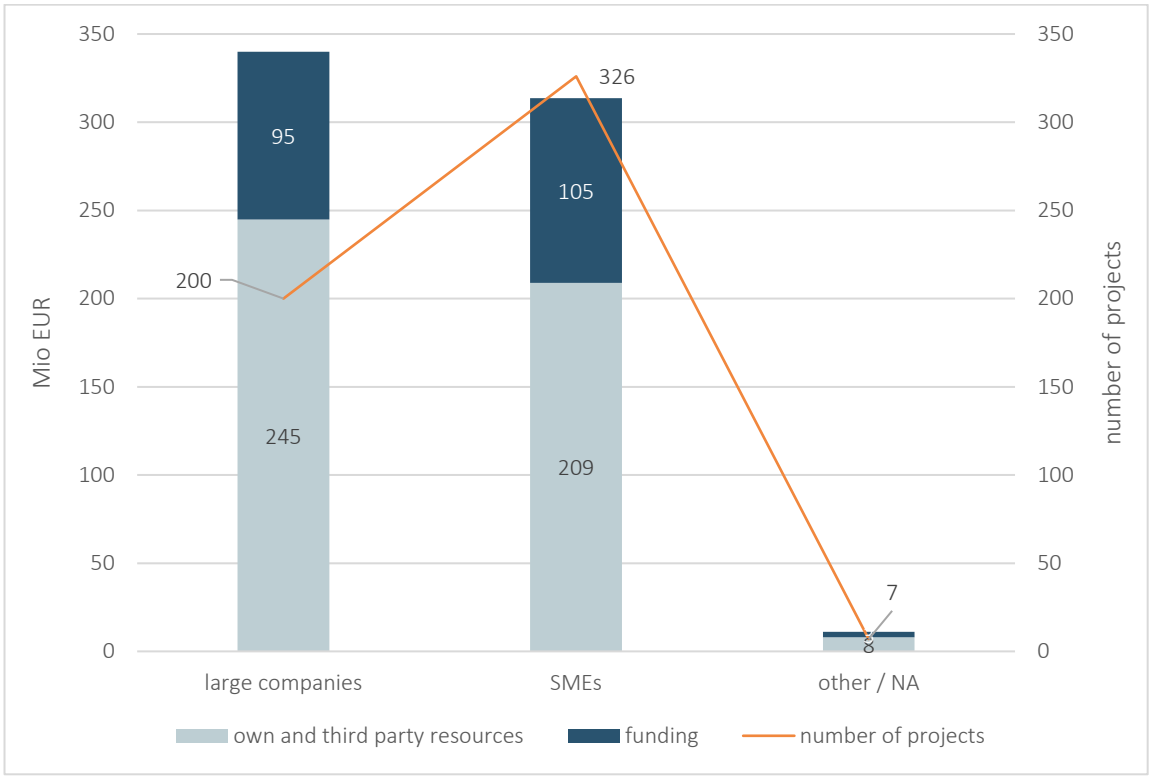
Company-size and gender diversity

61% of all projects are carried out in small and medium-sized enterprises (SMEs), accounting for 47% of the total project volume with an average funding rate of 33%. A further 31% of projects are carried out by large companies, combining 51% of the total project volume with a 28% average funding rate. 1% of implementing companies were not classified in the data (see Figure 7). Of the three federal states, which together account for 71% of all projects, Baden-Württemberg (71%) has the highest proportion of projects located in SMEs, followed by Bayern (59%) and Nordrhein-Westfalen (58%).

Although not part of the evaluation plan, it is still interesting to look at the gender aspect of project implementation. In large enterprises, 9% of project applications were led by women[3], while in SMEs, only 5% of projects have a female project leader. This is significantly lower than the overall share of 20% women working in the manufacture of motor vehicles and parts in Germany in 2023 (Statistisches Bundesamt, 2024). Gender differences are also evident in funding and project volumes (see Figure 8). On average, the total volumes of female-led projects are roughly a fifth lower. The total project volume of the 34 female-led projects amounts to €34 million, 33% of which come from the funding scheme. The other €631 million in project volume is distributed among the 499 projects led by males, 30% of which come from funding. While projects with male project leaders have a mean project volume of €1.26 million and a median project volume of €0.83 million, the mean volume of female-led projects is €0.99 million and the median €0.60 million, corresponding with the higher share of project leaders in large companies.

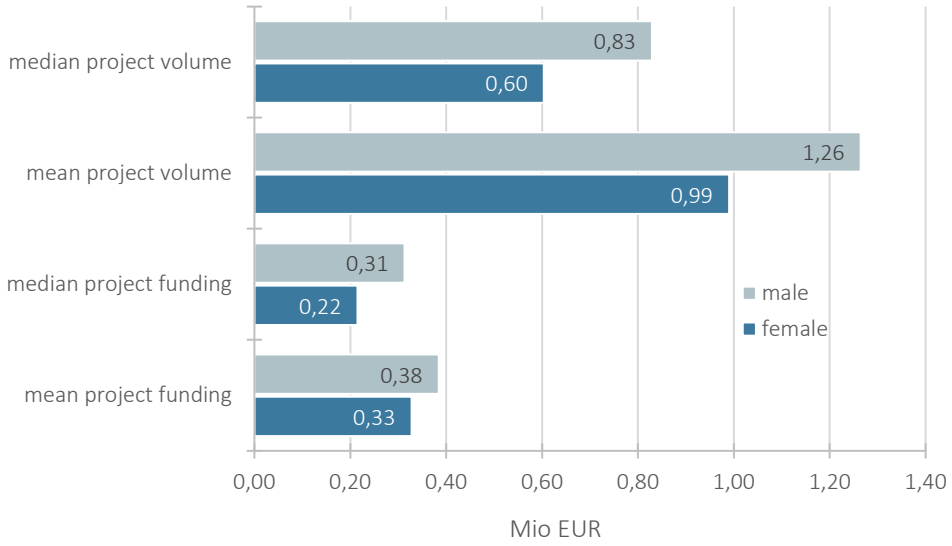
[3] It should be noted that the gender distribution must be interpreted with caution, as managers were often named as contact persons but were not directly involved in the project.

Figure 7 Number and volume of projects per company size



Source: Own analysis of funding database; n=533 projects.

Figure 8 Average project volumes and project funding by gender



Source: Own analysis of funding database; n=533 projects.

6 | Summary and conclusions

The State Aid SA.62787 (2021/EV) "investment programme for modernising production in the vehicle manufacturing and vehicle supply industry" subsidy scheme was implemented as planned in March 2021. It was discontinued in November 2023, approximately a year earlier than anticipated, due to the early utilisation of all funds. No further applications were accepted from October 2022 onwards. The total volume of the funding scheme was €202.9 million, with the majority of this amount being granted in 2021.

Given that the average project duration is approximately 16 months and that the available data only arrive with a delay of 18-24 months, it is only possible to carry out the key analysis for the evaluation by the end of 2026. This report reviews the empirical basis for the analytical quantitative estimations. A detailed overview of the planned methodology is provided in chapter 4. The final report assessing the proposed evaluation questions will be presented in June 2027.

However, preliminary analyses of the monitoring data are presented in chapter 55 | above. The main findings presented in this chapter are the distribution of funded projects by region and economic sector, the relationship between regional employment dependency on the automotive industry and the number of funded projects, the thematic focus on digitalisation and/or process innovation, the type of implementing enterprise, and the gender diversity of project leaders.

The majority of funding is concentrated on the heavily industry-oriented federal states of Baden-Württemberg, Bayern and Nordrhein-Westfalen, which account for around three quarters of the total number of projects and volumes. These states and Saarland also have the highest dependency of their regional labour markets on the automotive industry. More than half of the projects focus on manufacturing of metal products and the production of automobiles and automobile parts. Almost all enterprises host one funded project each, with only one enterprise hosting two projects. This points towards a rather even distribution of funds in the target community.

The funding scheme's primary objectives, which include facilitating digitalisation and process innovation, are reflected in the allocation of subsidies. More than half of the projects, representing over half of the total project volume, address both objectives. A further 44% of projects, representing an equal share of the total funding, are focused on process innovation, but not digitalisation. Only 1% of projects are focused on digitalisation, while 3% are aimed at other objectives. More than three fifths of all projects are carried out by small and medium-sized enterprises, of which 5% are led by women. In large companies, the proportion of female project leaders is 9%. In terms of funding, female-led projects on average have a lower total volume and a lower funding rate compared to male-led projects.

7 | References

Abadie, A., Diamond, A., & Hainmueller, J. (2010). Synthetic control methods for comparative case studies: Estimating the effect of California's tobacco control program. *Journal of the American Statistical Association, 105*(490), 493-505.

Abadie, A., & Gardeazabal, J. (2003). The economic costs of conflict: A case study of the Basque Country. *American Economic Review, 93*(1), 113-132.

Becker, M., & Klößner, S. (2018). Fast and reliable computation of generalized synthetic controls. *Econometrics and Statistics,* 5, 1-19.

European Union (EU). (2021). Consolidated text: Commission Regulation (EU) No 651/2014 of 17 June 2014 declaring certain categories of aid compatible with the internal market in application of Articles 107 and 108 of the Treaty. Retrieved from https://eur-lex.europa.eu/legal-content/EN/TXT/?uri=CELEX%3A02014R0651-20210405

Federal Ministry for Economic Affairs and Energy (BMWi). (2020). *Bundesregelung Kleinbeihilfen 2020*. Retrieved from https://www.ueberbrueckungshilfe-unternehmen.de/Content/Downloads/bundesregelung-kleinbeihilfen-2020.pdf?__blob=publicationFile&v=8

Federal Ministry for Economic Affairs and Energy (BMWi). (2021). *Richtlinie zur Förderung von Forschungs- und Entwicklungsprojekten im Rahmen des BMWi-Programms "Neue Fahrzeug- und Systemtechnologien"* (Konsolidierte Fassung vom 15. Juni 2015, geändert am 19. November 2018 und am 16. März 2021). Retrieved from https://www.bmwi.de/Redaktion/DE/Downloads/F/fachprogramm-neue-fahrzeug-und-systemtechnologien.pdf

Federal Ministry for Economic Affairs and Climate Action (BMWK). (2021). *Förderrichtlinie: Investitionsprogramm Modernisierung der Produktion Fahrzeughersteller und Zulieferindustrie*. Retrieved from https://www.bmwk.de/Redaktion/DE/Downloads/F/foerderrichtlinie-investitionsprogramm-modernisierung-der-produktion-fahrzeughersteller-und-zulieferindustrie.pdf?__blob=publicationFile&v=6

Federal Ministry for Economic Affairs and Climate Action (BMWK). (2023). *Bekanntmachung der Aufhebung der Bekanntmachung der Förderrichtlinie "Investitionsprogramm Modernisierung der Produktion Fahrzeughersteller und Zulieferindustrie*". Retrieved from https://www.bafa.de/SharedDocs/Downloads/DE/Wirtschaft/mfz_aufhebung.pdf?__blob=publicationFile&v=2

Federal Office for Economic Affairs and Export Control (BAFA). (2023). *Modernisierung der Produktion Fahrzeughersteller und Zulieferindustrie.* Retrieved from https://www.bafa.de/DE/Wirtschaft/Handwerk_Industrie/Modernisierung_Fahrzeughersteller_Zulieferindustrie/modernisierung_fahrzeughersteller_zulieferindustrie.html

Iacus, S. M., King, G., & Porro, G. (2012). Causal inference without balance checking: Coarsened exact matching. *Political Analysis, 20*(1), 1-24.

Medhurst, J., Marsden, J., Jugnauth, F., Peacock, M. & Lonsdale, J. (2014). An economic analysis of spillovers from programmes of technological innovation support. Retrieved from https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/288110/bis-14-653-economic-analysis-of-spillovers-from-programmes-of-technological-innovation-support.pdf

Rosenbaum, P. & Rubin, D. (1985). Constructing a Control Group Using Multivariate Matched Sampling Methods That Incorporate the Propensity Score. The American Statistician, 39(1), 33-38.

Statistisches Bundesamt (2024). Statistischer Bericht Mikrozensus – Arbeitsmarkt 2023 (Erstergebnis). Retrieved from https://www.destatis.de/DE/Themen/Arbeit/Arbeitsmarkt/Erwerbstaetigkeit/Publikationen/Downloads-Erwerbstaetigkeit/statistischer-bericht-mikrozensus-arbeitsmarkt-2010410237005-erstergebnisse.xlsx?__blob=publicationFile

Xu, Y. (2017). Generalized synthetic control method: Causal inference with interactive fixed effects models. *Political Analysis, 25*(1), 57-76.