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Research Report

Support to SMEs - Increasing research and innovation in SMEs and SME development. Work package 2. Saxony (DE): Regional Operational Programme ERDF 2007-2013. Case Study

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Support to SMEs - Increasing Research and Innovation in SMEs and SME Development

Work Package 2

Saxony (DE)

Regional Operational Programme ERDF 2007–2013

Case Study

Ex post evaluation of Cohesion Policy programmes 2007-2013, focusing on the European Regional Development Fund (ERDF) and the Cohesion Fund (CF)

Contract: 2014CE16BAT002

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Regional Operational Programme ERDF 2007–2013

September – 2015

The consortium selected comprises CSIL – Centre for Industrial Studies (lead partner, Italy), CSES – Centre for Strategy & Evaluation Services (UK) and ZEW – Centre for European Economic Research (Germany).

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The authors of this report are Christian Köhler and Michaela Niefert. The authors are grateful to all the programme managers, stakeholders and beneficiaries who provided data, information and opinions during the field work.

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LIST OF ABBREVIATIONS

AIR	Annual Implementation Report
ERDF	European Regional development Fund
ESF	European Social Fund
EU27	European Union 27
GDP	Gross Domestic Product
ICT	Information and Communication Technology
MA	Managing Authority
NOP	National Operational Programme
OP	Operational Programme
R&D	Research and Development
RDI	Research development and Innovation
ROP	Regional Operational Programme
SMEs	Small Medium Enterprises
SAB	Sächsische AufbauBank

1. EXECUTIVE SUMMARY

The objective of this study is to perform an ex-post evaluation of the instruments applied in the OP ERDF Saxony 2007-2013 to facilitate SMEs' growth and innovation. The analysis encompasses 9 instruments that were identified as either targeting SMEs in particular or being mainly absorbed by SMEs. Applying the theory-based impact evaluation[1], the study firstly examines the intervention logic of the OP and also to what extent the applied instruments are appropriate in order to achieve the declared objectives. Secondly, evidence of achievements is presented providing an in-depth understanding of the mechanisms and conditions influencing the instruments impact on SMEs' growth and innovation.

Data collection included publicly available hard data, information provided by strategic and programming documents, annual implementation reports, evaluation studies, and indicators from the monitoring system complemented by a number of telephone interviews with representatives of the managing authority, awarding authority, beneficiaries, stakeholders and individual experts. Data collection was carried out during the period November 2014 – May 2015.

1.1. Regional context

The Free State Saxony is a convergence region in the southeast of Germany which is characterized by most economic indicators being below EU or German average. Nevertheless, the economic development in Saxony is very dynamic with GDP per capita (Purchasing Power Standard[2]) and unemployment recently exhibiting positive trends.

One major challenge for Saxony is to channel the knowledge existing in its well-developed and diverse public R&D sector towards application in businesses and thus to commercial exploitation. So far the contribution of private businesses to R&D expenditure remains below average which is partly due to the region's large share of SMEs often lacking the financial and human resources to engage in R&D. There are R&D intensive industries however, exhibiting a regional specialisation and growing employment. Having said that, the main share of SMEs in Saxony is active in more traditional sectors with a low focus on innovation while the manufacturing sector provides a below average contribution to gross value added.

Compared to other European regions, Saxony was mildly affected by the economic crisis. Unemployment and R&D activities remained on a stable level and overall the Saxon economy quickly recovered and exhibited positive growth rates already in 2010.

1.2. Policy framework and the role of the ERDF

Saxony promoted a growth strategy centred on innovation and investment as key drivers of growth and pursued this strategy with a high degree of continuity. Investments in education, the establishment of research institutions and R&D infrastructure as well as the support of business R&D were undertaken to strengthen the regional innovation system. Acknowledging the fact that private R&D investments are comparatively low, the support of technology transfer via start-ups or via collaborative projects between research institutions and enterprises has recently become more and more important. Complementary to the support of technology development, Saxony strongly promotes fixed capital investments conditional upon the creation of new jobs. Main features of the growth strategy are the orientation along the life-cycle of an enterprise and openness. While the former allows the exploitation of complementarities in support, the latter is seen as a requirement for the discovery of profitable market niches. Therefore, all firms can receive R&D support if the relation between potential and risks is balanced in a reasonable way.

[1] The methodological approach is presented in detail in the Inception Report and in the 1st Intermediary Report.
[2] The purchasing power standard (PPS) is an artificial currency which is in the case of the GDP defined as the GDP in national currency divided by purchasing power parities. In theory on PPS can buy the same amount of goods and services in each country. Thus, it removes differences in price levels across countries and allows comparison of different national GDPs (for further explanations on the concept of PPS see Eurostat, 2015).

Saxony's growth strategy is framed by national and EU-wide activities to develop structurally weak regions. Major sources of financing are ESF and ERDF with the latter playing an important role in the support of RDI activities. Complementarities between ESF and ERDF arise as firms can get funding from ESF for the employment of R&D personnel while R&D project support is financed with ERDF funds. R&D programmes on national or European level (EU Framework programme) increasingly contribute to the share of received business R&D support in Saxony. In addition, Saxony receives funds from the national government in the framework of the regional development within Germany (GRW) which are leveraged with ERDF funds and support business investments and the development of economic infrastructure.

1.3. ERDF strategy

The OP ERDF Saxony 2007-2013 initially had a total budget[3] of EUR 4.12 billion which remained stable throughout the financing period. Almost one third of the budget was geared towards instruments supporting SMEs innovation and growth.

In order to overcome the structural deficits within the region, the main objectives of the OP are:

- strengthening of research, science, development, technology transfer and innovativeness in order to promote growth and competitiveness,

- increase the level of competitiveness in the regions' economy as a means to converge towards German and EU averages in terms of GDP, employment, capital endowment and productivity and

- increase the contribution of manufacturing firms to gross added value, increase exports and the number of permanent jobs by supporting business investments.

In line with recent empirical evidence, the instruments directed towards SMEs were based on the central role of innovation and investments addressing typical barriers to growth, e. g. high risk and financial constraints. The main effects expected from the strategy were an increase in both tangible and intangible capital (RDI investments) as well as an increase in employment. This is also reflected in the allocation of budget to the support of (collaborative and non-collaborative) business R&D activities and business investments which absorb roughly 90% of the budget targeting SMEs. The majority of instruments were already successfully applied in the previous ERDF period implying that the strategy rests upon established and successful instruments which are expanded by other (financially small scale) measures. The intervention logic is clear-cut for the major share of instruments. For the instruments targeting lower production costs, however, it is not a priori clear that the proposed objectives of safeguarding and creating jobs can be accomplished.

1.4. Main findings

With regards to the effectiveness and the achievements of the applied instruments, the main findings can be summarized as follows:

- The operational part of implementation was to a large extent carried out by Sächsische AufbauBank (SAB) – the central development agency of the Free State – constituting a "one-stop-shop" for beneficiaries. The long standing experience of SAB as granting authority helps to design effective application criteria that match the target group of firms well. The consulting provided by SAB with respect to application criteria and formal requirements allows a high degree of efficiency in the granting process.
- The beneficiary structure is to a large extent consistent with the OP's effort to develop a strong manufacturing sector and increase its contribution to gross value added. Even though the instruments are demand-based the major share of assistance was absorbed by manufacturing firms.

[3] This includes both public and private funds.

- RDI supporting instruments show a high degree of achievement in increasing the level of R&D and cooperation. They also record high achievements with respect to employment and turnover growth. Instruments supporting the increase of fixed capital achieved their main objective to a high degree as well.
- Due to restrictions of available data, a conclusive assessment of the instruments' achievements on the level of beneficiary firms was not or only partially possible in most cases. In general, there is a need for better data on the level of the instrument in order to assess the effectiveness of the instruments properly.
- Saxony provides an example that ERDF funds can be used to establish successful supporting instruments for SMEs which help to overcome barriers regarding R&D and investments. This is also highlighted by the fact that an increasing share of supported firms successfully applies to national and European R&D programs where competition is more intense.

2. CONTEXT AND BACKGROUND

This section provides a concise description of the regional context by illustrating the key socio-economic features, the characteristics of the economic fabric - in particular of the SMEs (elaborating on their barriers to growth and innovation) - and the policy framework for industrial and innovation development.

2.1. Socio economic context

The Free State Saxony is a convergence region which is located in the southeast of Germany bordering the federal states Brandenburg, Saxony-Anhalt, Thuringia and Bavaria as well as the EU countries Poland and Czech Republic (see Figure 1). The largest cities are Leipzig with a population of 531,562 followed by the state capital Dresden with 530,754 inhabitants and Chemnitz with a population of 242,022 (referring the end of 2013, Statistical Office of the Free State Saxony, 2014).

Figure 1. Geographical position of the Free State Saxony within Europe

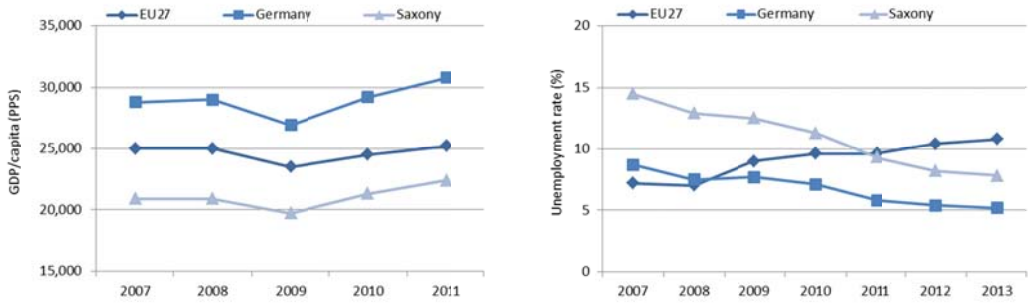
Source: CSIL, First Intermediate Report

Unlike EU27, Saxony faces a steadily decreasing population. The total population decreased from 4.25 million in 2007 to 4.13 million in 2013 (- 2.8%). The population in Germany decreased by only 0.4% (Eurostat, 2015b) during this period. The decrease in the region's working population was even more pronounced. The labor force (age bracket 15 to 64 years) shrunk by 8.9% in the period 2007 – 2013 (Eurostat, 2015b) which contrasts with the development in Germany (- 1%) and EU27 (+ 0.6%).

Saxony's development with respect to GDP is very positive. The GDP per capita in purchasing power standards (PPS) increased from EUR 20,900 in 2007 to EUR 22,400 in 2011 (+ 7.2%). Yet, the absolute value is still below the values of EU27 and Germany. While the Saxon GDP per capita (PPS) grew only slightly stronger compared to Germany (+ 6.9 %), it clearly outperformed EU27 (+ 0.8 %) over the considered time period, thereby reducing the gap significantly.

Saxony's rate of unemployment shows a positive development, too. It fell from 14.5% in 2007 to 7.8% in 2013 which is in stark contrast to the development on European level. The unemployment rate in EU27 increased and exceeds the Saxon rate as of 2011. Unemployment in Saxony is still higher than in Germany but the gap is closing steadily.

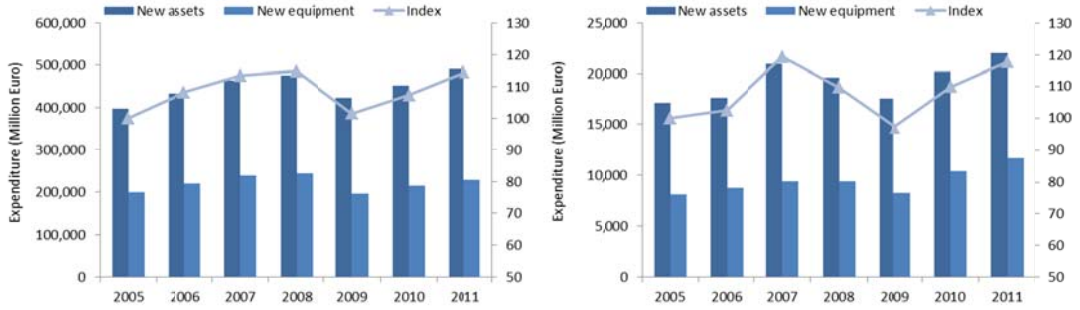
Figure 2. Development of GDP per capita (PPS) and the rate of unemployment in EU27, Germany and Saxony



Notes: Left panel shows development of GDP per capita (PPS) for the period 2007-2011. Right panel shows development of the unemployment rate in % for the period 2007-2013 in the age group 15-64 years.
Source: Own elaboration of Eurostat (2015c, 2015d).

Considering the development of both GDP per capita and the rate of unemployment it is obvious that the effects of the economic crisis on the general economic development in Saxony are not as severe as in other European regions. The drop in Saxony's GDP per capita during the crisis year 2009 was less pronounced compared to both Germany and EU27. The recovery took place rapidly with GDP per capita exceeding pre-crisis values already in 2010. There is no observable effect of the crisis with respect to the rate of unemployment. However, it is possible that the quality of employment changed, i. e. permanent contracts may have been converted into temporary contracts.

Figure 3. Development of investments in Germany and Saxony between 2005 and 2011



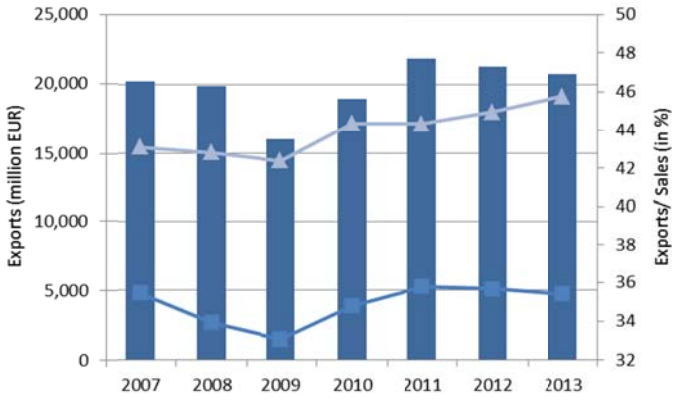
Notes: Left panel shows development of the investments in Germany. Right panel shows development of the investments in Saxony. New assets include investments in equipment, other assets and new buildings. Expenditure is in current prices. Index is a chain index and refers to price adjusted total gross capital (2005 = 100).
Source: Own elaboration of National Accounting of the Federal States (2013).

As a consequence of the German Democratic Republic's breakdown, a heavy de-industrialisation took place in the early 1990s which led to a significantly lower capital stock in Saxony and the other federal states located in Eastern Germany. Not surprisingly, the process of re-industrialisation in Saxony from the middle of the 1990s to the early 2000s went hand in hand with high investment levels relative to GDP. This reflected efforts of industrial settlements, extensions of production plants and general updating of the capital stock in order to establish a competitive structure of the economy (Wagner, 2013).

Saxony exhibited a high share of investments in GDP in the period from 2000 to 2009 (Wagner, 2013). Capital intensity, defined as the relation between the capital stock and employees, was EUR 232,451 per employee in 2008 which corresponds to 79.4 % of the German capital intensity in that year (EUR 292,602). During the period from 2000 to 2008, the Saxon capital intensity has increased steadily. The gap to the German capital intensity has been reduced by 6 percentage points (Wagner, 2013). Figure 3 shows that compared to Germany, investments in Saxony have grown stronger since 2005. Particularly in 2007, 2010 and 2011, Saxony exhibits high growth in investments. In

2009, total gross capital in Saxony shrunk as a consequence of the economic crisis. But recovery was accomplished fast and pre-crisis levels were reached again in 2010.

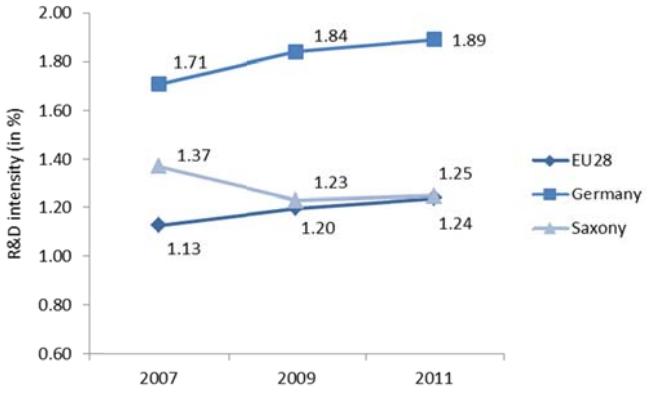
Figure 4. Development of exports in Saxony between 2007 and 2013



Notes: Data for plants with 20 or more employees in manufacturing and mining (NACE sectors B and C). Bright line displays export intensity for Germany and dark line for Saxony.
Source: Own elaboration of Federal Statistical Office (2008, 2009, 2010, 2011, 2012, 2013, 2014a)

Errore. L'origine riferimento non è stata trovata. shows the absolute level of exports in Saxony to fluctuate around EUR 20 billion. The export intensity – measured as ratio between exports and sales – is about 35%. The German value fluctuates around 45%. The main reasons for this gap are the high number of SMEs, the lack of networks and low awareness of foreign customers in Saxony (Wagner, 2013). The negative impact of the crisis in 2009 is apparent. In the following two years, exports and export intensity sharply increased in Saxony. But since 2011 the export intensity has slightly decreased whereas the German export intensity has increased.

Figure 5. Development of R&D intensity in the private sector between 2007 and 2011



Notes: R&D intensity is measured as the share of business R&D expenditure in GDP.
Source: Eurostat (2015e)

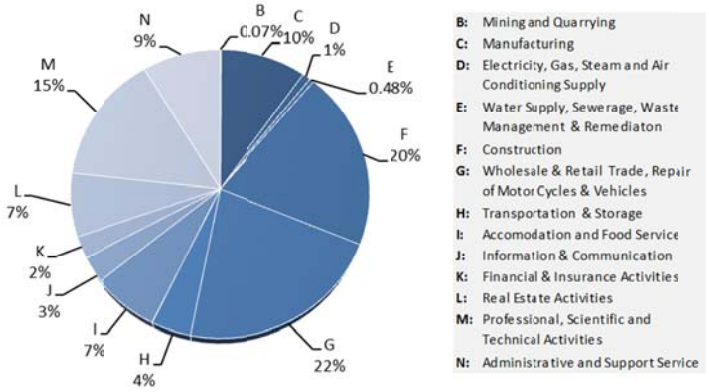
Despite the weak level of exports, the Saxon economy improved its competitiveness from 2010 to 2013 according to the Regional Competitiveness Index (Annoni and Dijkstra, 2013). The Saxon regions are ranked in the second highest class of regional competitiveness. One of the main reasons is a highly developed and well working innovation system consisting of excellent universities, numerous applied research institutes and an increasing number of R&D performing firms. The high level of innovativeness can be attributed to the high R&D performance (expenditure and employment) in the public sector which is above German average. Saxony almost fulfills the Europe 2020 target of 3% R&D expenditure as a share of GDP (R&D intensity). However, the contribution of the private businesses is comparatively small (see Figure 5). While in Germany about 1.9% of GDP is spent by enterprises on R&D, the corresponding share in Saxony is 1.25% which equals the value of EU28.

In summary, Saxony is characterized by an aging population and a shrinking workforce. The economic development is quite positive and with respect to GDP growth, unemployment and capital investments on a good way to catch up to more developed regions. In contrast, the development of the export intensity and of the R&D intensity in the private sector stagnates. Private R&D spending is below the German average although the diverse and well-developed public R&D sector contributes to increasing competitiveness. Therefore, one of the main challenges for Saxony is to channel the knowledge existing in public R&D institutions towards private businesses allowing a commercial application of innovations and new technologies.

2.2. Regional industrial fabric and SMEs

After the breakdown of the GDR, Saxony experienced a strong structural change of the economy. As a result, the regional enterprise structure is characterized by a very high share of SMEs while the number of large enterprises is proportionally low. Some of the barriers to growth presented in the previous section can be directly attributed to this. Their size prevents SMEs from realizing economies of scale. Therefore, SMEs are typically constrained by a lack of resources (financial, managerial and know-how) leading to an unawareness of technological and commercial opportunities and subsequently to a lack of investments in both tangible (capital stock) and intangible (R&D) assets. Hence, productivity is low and competitiveness impeded.

Figure 6. Distribution of SMEs across the NACE sectors B-N in 2012



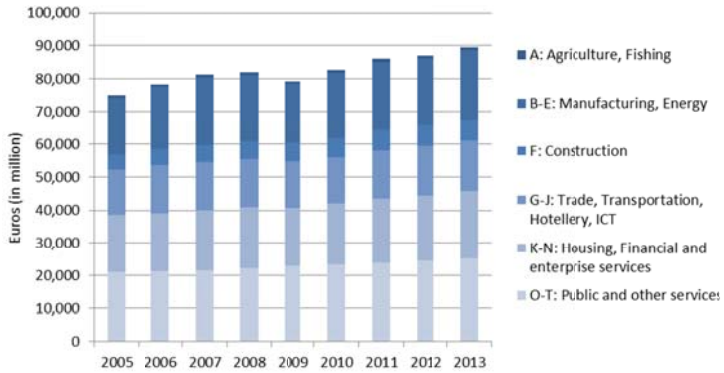
Notes: Sector classification according to Nace Rev. 2.
Source: Own elaboration of Federal Statistical Office (2014b).

Across all industries Saxony had about 187,000 enterprises in 2009. More than 99% of these firms have less than 250 employees and employ about 79% of Saxony's workforce. Considering only NACE sectors B-N, where most SMEs operate, the total number of SMEs was 140,527 in 2008 and 143,633 in 2012, of which 91% were micro enterprises, 8% small and 1% medium enterprises. The numbers of small and medium SMEs have increased by 4% and 6% respectively between 2008 and 2013, while the number of micro enterprises experienced a more modest growth (2%).

The distribution of the roughly 144,000 SMEs across the NACE sectors B-N in 2012 is shown in Figure 6. The majority of SMEs is active in the sectors wholesale and retail trade (G), construction (F) and professional, scientific and technical activities (M). Merely 10% of the SMEs are active in manufacturing.

Due to the unavailability of data on R&D expenditure at NACE 2 digit level in the region, no detailed figures can be derived on the technological intensity of the resident SMEs. The number of business start-ups in Saxony is below German average. Between 2007 and 2010 32.1 enterprises per 10,000 employees have been founded on average (Germany: 40.3). The absolute number of start-ups decreased as compared to the previous 4-year period.

Figure 7. Development of gross value added 2005-2013 in Saxony and sectoral contribution



Notes: Gross value added in current prices.
Source: Own elaboration of Statistical Office of the Free State Saxony (2014)

Even though the share of SMEs in manufacturing industries is very low, the contribution of the sector to Saxony's gross value added is of high relevance. The manufacturing industries and energy contributed 22.75% of gross value added in 2005 and the share slightly increased to 23.49% in 2013 (see Figure 7). However, it is still below the German value. In total, gross value added increased from EUR 74.9 billion in 2005 to EUR 89.5 billion in 2013. This corresponds to a growth of about 19.5% which is 2 percentage points below the growth of 21.5% observed in Germany. Saxony shows a significantly stronger contribution of the sectors construction (in 2013: 7.27% Saxony, 4.61% Germany) and public and other services (in 2013: 28.21% Saxony, 22.26% Germany).

Considering the degree of specialisation[4] within an industry and the development of employment, the industries manufacture of electrical equipment, motor vehicles, metal, IT services as well as architectural and engineering activities; technical testing and analysis show a high degree of specialisation in combination with a dynamic development in job growth. Industries like chemicals and pharmaceutics exhibit high job growth but a degree of specialisation below average.

To conclude, some of Saxony's growth barriers (low level of capital stock, private R&D investments as well as exports) are directly attributable to the growing number of SMEs which account for more than 99% of the total enterprise population and are mainly active in low innovative industries. Merely 10% of the SMEs are active in manufacturing industries but the contribution of the manufacturing firms to gross value added is significant (23%). Compared to Germany this value is below average, however. The positive development of gross value added in Saxony during the ERDF funding period was mainly driven by the public sector. Some resident R&D and knowledge intensive industries (e. g. electrical equipment and IT services) have significant growth potential due to their high degree of specialisation and dynamic job growth.

2.3. Policy Framework

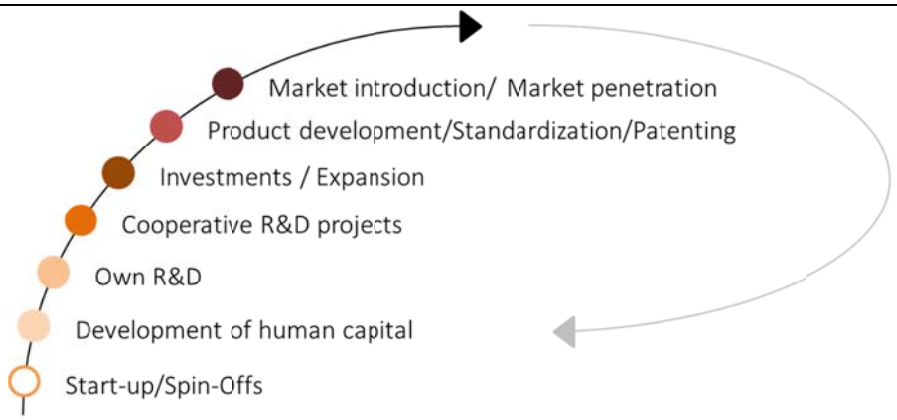
Over the last decades the regional administration of Saxony promoted a strategy centred on innovation as one of the key drivers of growth and pursued this strategy with a high degree of continuity. It includes investments supporting entrepreneurship, education, the establishment of research institutions and R&D infrastructure as well as the support of business R&D. Acknowledging the fact that private R&D investments are comparatively low while valuable knowledge and readily developed innovations are available in resident research institutions, the support of technology transfer via start-ups or via collaborative projects between research institutions and enterprises has recently become more and more important.

[4] The degree of specialization reflects an industry's stock of firms in Saxony compared to other East German federal states. A high degree of specialization refers to a higher number of firms compared to the other states.

The R&D support in Saxony is structured along the life cycle of an enterprise (see Figure 8) and highly complementary with European and national support schemes. The major sources of funding are European structural funds, i. e. ERDF and ESF. While the former is used to support research and development projects, the latter is used to support training and education of employees. Also the employment of innovation managers is supported with ESF funds. R&D programmes on national or European level (EU Framework programme) increasingly contribute to the share of received business R&D support in Saxony.

On national level several programmes to support business R&D activities and technology transfer from research centres into firms are in place. The programmes dedicated to particular areas of technology pursued by the Federal Ministry for Economic Affairs (BMWi) and the Federal Ministry of Education and Research (BMBF) are of main importance for Saxon firms. The national Central Innovationprogram for SMEs (ZIM) is of particular significance for Saxony which is reflected by the fact that EUR 623 million were committed to Saxon firms (BMWi, 2015).[5] Important is also the support of clusters of excellence within the framework of Germany's high tech strategy. 15 of such clusters are supported with a total of EUR 600 million within 5 years. Three clusters involve Saxon firms. Regional funds are used to close gaps in the support scheme. Saxony supports for instance enterprises in conducting market analysis which is not possible with financial means from European structural funds (Stegmann et al., 2007).

Figure 8. Policy framework of technology support in Saxony



Source: PwC, 2014

Complementary to the support of technology development, Saxony also strongly promotes fixed capital investments. Saxony receives funds from the national government in the framework of the regional development within Germany (GRW) which are leveraged with ERDF funds and support business investments and economic infrastructure (cluster support). Moreover, enterprises located in East Germany may apply for an investment bonus (Investitionszulage) which was granted for investments in fixed capital during the period between 2007 and 2014.

A major component of the Saxon growth strategy – in particular of the RDI support – is its openness. That is, the regional authorities do not define particular industries as "key industries" and subsequently gear public funds towards firms active in these industries. The view of the authorities is rather that innovative firms may occur in all industries, even in those not prone to radical innovations. According to this view, market niches that may be captured with innovative products are more likely to be discovered by firms than by politicians or bureaucrats. Consequently, all firms can receive funding if the relation between potential and risks is balanced in a convincing way.

[5] Saxon firms are very successful in applying for R&D support. Only Baden-Württemberg receives more funding from ZIM (BMWi, 2015).

3. ERDF STRATEGY ON SMES

The aim of the present section is, first, to give an overview on objectives and priorities of the OP which includes an assessment of the intervention logic underpinning the mix of policy instruments. Secondly, implementing bodies are briefly described while thirdly, the implementation of OP Saxony and reprogramming of budget is delineated.

3.1. Objectives and priorities

The main goal of the OP Saxony 2007 – 2013 is to support the sustainable development of the region and the improvement of the requirements for environmentally sound growth of the economy and employment (OP Saxony, 2013; p. 174). This is coherent with the goals of the Lisbon strategy on the one hand and the goals of the German national strategic framework (NSF) on the other hand. The NSF defines strategic objectives and priorities for German regions in the target convergence.

The OP's budget totals EUR 4.12 billion[6] of which EUR 3.09 billion (75%) were contributed by the ERDF (OP Saxony, 2013, p. 285). In comparison to the funding period 2000 – 2006, ERDF contribution decreased by 10% (Stegmann et al., 2007, p.43).[7] The budget is allocated on 5 Priority Axes of which 2 include the instruments dedicated to support of SME growth and innovation (Axis 1 and 3). Axis 1 is dedicated to the strengthening of innovation, science and research. The total budget is EUR 1.5 billion corresponding to about 37% of the total budget. ERDF contributed EUR 1.13 billion. In the previous funding period ERDF contributed EUR 1.04 billion to this area which corresponds to an increase of about 8.9%. Hence, the support of innovation and R&D was attached more value in the OP 2007 – 2013. Axis 3 is dedicated to increase competiveness in the business enterprise sector. The total budget is EUR 758.2 million of which EUR 568.67 million were contributed by ERDF. This corresponds to roughly 18% of the total OP budget and implies a decrease in ERDF contribution by roughly 14% compared to the period 2000-2006.

In order to overcome the regions structural deficits (see section 2.1), the main objectives of the OP are:

- strengthening of research, science, development, technology transfer and innovativeness in order to promote growth and competitiveness,
- increase the level of competitiveness in the regions' economy as a means to converge towards German and EU averages in terms of GDP, employment, capital endowment and productivity and
- increase the contribution of manufacturing firms to gross added value, increase exports and the number of permanent jobs by supporting business investments.

As a result, OP Saxony's objectives are appropriately chosen to overcome the barriers to growth identified in section 2.1 and given the industry fabric described in section 2.2 Comparing the objectives with the budget allocation the OP's approach is coherent.

3.1.1. Policy Mix and Intervention logic[8]

Within OP Saxony, 10 instruments either explicitly target SMEs or are directed towards regional firms with a major share of SMEs as beneficiaries. In this case study we will focus on 9 instruments (for an overview see Table 1) because of the reason that no data is available for the subordinated loans fund which was introduced in 2010 as a part of the instrument support of investment (see section 3.3.2).[9] The total budget allocated to the respective instruments amounts to 1,391.3 million EUR which corresponds to about 34% of the total OP budget (OP Saxony, 2013, p. 285).

[6] The total budget refers to the sum of public and private funds.
[7] The ERDF contributed 3.4 billion EUR in the period 2000-2006.
[8] Data presented in this chapter are more updated with respect to those included in the OP fiche contained in the Intermediate Report – Volume II.
[9] In addition, the volume of the fund is compared to the grants relatively small (about 5%).

The implemented instruments are aligned with the suggested approaches in the German national strategic framework and were – to a large extent – already applied in the previous ERDF period, reflecting again the continuity of Saxony's growth strategy. Evaluation results of the OP Saxony 2000 – 2006 were positive for the support of investments, R&D activities and fair participation which led to the recommendation of continuation.[10] Therefore, the policy mix addressing SMEs growth and innovation rests upon established and successful instruments and is expanded by other (financially small scale) measures.

The openness of the Saxon growth strategy is reflected by the fact that all instruments are strongly demand-based, i. e. there is no explicit support of particular industries or technology fields.[11] Implicitly, however, existing regulation excludes particular industries at least for investment support. Also the supply of supporting instruments along the enterprise life-cycle is realised in the policy mix. Firms may be supported in the start-up phase, in their R&D activities and then again in the production and marketing of their (innovative) products. The support was mainly delivered by grants to either individual or groups of enterprises.

One barrier to growth in Saxony is the low private sector R&D spending which is addressed by 4 of the 9 instruments.[12] The instruments address the high uncertainty and risk of R&D outcomes (R&D project support and technology transfer) as well as financial constraints (venture capital). Moreover, the instruments "collaborative R&D support" and "technology transfer" undertake an attempt to facilitate knowledge spillover from the well-developed public R&D sector to SMEs. The objective is growth as well as creation and safeguarding of jobs.

The intervention logic of the RDI supporting instruments is well-grounded on evidence provided by academic literature. The question whether or not subsidizing firms' R&D activities provides a stimulus to private R&D investment has attracted a lot of research interest among economists. Most studies find evidence for positive additionality effects on both innovation inputs and outputs, i. e. public support triggers private R&D investments and is productive in terms of product innovation or patents (for a recent survey see Czarnitzki and Lopes-Bento, 2013). Those effects may be particularly strong for SMEs (Hottenrott and Lopes-Bento, 2014). Also the support of research collaborations is shown to not only increase private R&D spending but also to improve R&D productivity (Cassiman and Veugelers, 2002, 2005). The importance of innovation for productivity growth is consistently stressed (e. g. Griliches, 1994; Crepon et al., 1998; Griffith et al., 2006; Peters, 2008). Finally, it has been shown that financial constraints impede SMEs R&D expenditure (Czarnitzki and Hottenrott, 2011). Love and Roper (2015) provide an overview how innovation raises SMEs' productivity and export share.[13]

[10] For detailed results of the evaluation see Schwab et al. (2005). The evaluation took into account indicator results, scientific results (surveys and scoring approaches) and the experience of involved authorities.
[11] This is consistent with an assessment provided by OECD and World Bank: "Industrial and innovation policies characterised by top-down government interventions are not the right approach to development." (Dutz et al., 2014, p.15)
[12] The market failures eventually resulting in low private R&D spending are discussed in detail in the 1st Intermediary Report, pp. 53.
[13] Additional evidence is provided in the 1st Intermediary Report, pp. 64.

Table 1. Key policy instruments and intervention logic

Instrument	Description	Logic of intervention	Obj.	Mode of delivery	No. of bene-ficiaries*	Public exp. committed* (Million EUR)
1. Support of non-collaborative R&D	Supports R&D projects of individual enterprises	Supporting R&D investments by reducing the risk related to the uncertainty of precompetitive R&D	Innov.	Grants	205	124.6
2. Support of collaborative R&D	Supports R&D projects conducted by firms in collaboration with other firms or research institutions / universities	Supporting investment in R&D by promoting cooperation among enterprises and with research centers	Innov.	Grants	628	444.9
3. Technology transfer	Supports transfer of an existing product or process innovation by other firms or research institutions / universities to SMEs	Supporting investment in R&D by promoting cooperation among enterprises and with research centers	Innov.	Grants	371	16.8
4. Venture capital for young technology firms	Supports the provision of venture capital for technology-oriented firms in early phases or with high growth potential	Support business creation and development by attenuating information asymmetries between investors and firms.	Innova-tion AND Growth	Equity		45.0
5. E-Business in SMEs	Supports projects on the development, introduction and integration of enterprise specific IT-processes	Supporting adoption of digital solutions in SMEs by decreasing high investment costs.	Innov.	Grants	450	10.7
6. Support of investments	Supports investments in start, extend or diversify production conditional on creation of new jobs.	Increase fixed capital by decreasing investment costs.	Innov. AND Growth	Grants and loans	1,589**	572.3**
7. Market access of SMEs	Supports SMEs in foreign market entry by providing consulting, coaching and participation in fairs.	Increase export share by decreasing investment costs.	Growth	Package:grant + consultancy+ coaching	2,282	32.6
8. Energy efficiency in SMEs	Supports SMEs in increasing energy efficiency.	Increase fixed capital by decreasing investment costs.	Growth	Grants	2,106	17.7
9. Business networks	Supports SMEs networking and cooperation in procurement, production, distribution and marketing.	Support networking of SMEs to overcome size-related disadvantages.	Growth	Grants	140	11.7

Notes: *Cut-off dates for instruments 1-5, 9: 31.10.2014. For remaining instruments the cut-off date is 13.4.2015.
** Presented values exclude subordinated loans fund (see also section 3.3.2).
Source: Own elaboration of OP Saxony (2013)

Addressing the lack of SMEs' financial capability, the instrument "e-business in SMEs" is supposed to increase the level of ICT which in return lowers cost levels and increases beneficiaries' competitiveness contributing to safeguarding of jobs. As in case of R&D support, there are numerous studies providing evidence for the logic of intervention (see e. g. Hall et al., 2013; Cardona et al., 2013). One main feature of ICT is however the fast obsolescence of software and hardware. This may lead to high follow-up costs due to upgrading software, substitution of hardware components and necessary adjustments of business processes. Therefore, the question arises whether this instrument indeed contributes to the objective of sustainable growth. Also the effect on employment is not straightforward. There is extensive literature that ICT may substitute employment if workers perform routine tasks and increasingly so, with falling prices of ICT (see e. g. Spitz-Oener, 2006). On the other hand, the increasing use of ICT requires different levels of skill and complements workers in analytical and interactive tasks. Hence, this instrument could either lead to a change in the skill composition of supported firms or to reduction in employment if a firm's business entails a high share of routine tasks. This contradicts the objective of safeguarding jobs.[14]

Another barrier to growth in Saxony is the low level of capital stock compared to other German federal states (see section 2.1). This barrier is tackled by the instrument "support of investments".[15] The intervention logic is clear-cut: the lack of SMEs' internal funds is compensated by grants with the objective to increase fixed capital and support growth in terms of jobs and productivity. Since granting is conditional on the creation of new permanent jobs, the intervention is direct. The instrument "energy efficiency in SMEs" also tackles the low level of capital stock by supporting investments aiming at a more efficient use of energy. It is introduced against the background of increasing German energy prices during the last decade which seriously deteriorated the competitiveness of SMEs in energy-intensive industries. The instrument's objective is the safeguarding of jobs. At the same time, this measure contributes to environmental targets of the OP.

The instrument "market access for SMEs" provides support for the development of international markets and addresses the low export share in Saxony. Again, the intervention logic departures from the lack of resources (managerial and financial) typically found in SMEs. As a result, SMEs are unaware of commercial opportunities in foreign markets, even if they were efficient enough to enter international markets. In addition to the financial support of fair participation, the instrument also includes consultancy, coaching and support in the preparation of trade-fair appearances which is reasonable due to the extensive non-financial requirements of foreign market entry (different language, different currency, different legal framework, different institutions). In general, the approach is therefore appropriate to tackle the problem of low exports. It is questionable however whether the design of the instrument – which is rather oriented towards short-term gains - allows a sustainable development of international trade relationships since the receipt of support is limited to three fair participations. Still it will raise the awareness of beneficiaries with respect to foreign market opportunities.

The academic literature provides evidence that supporting the internationalisation strategies of SMEs proves successful in reaching and exploiting economies of scale (Lloyd-Reason and Mughan, 2002; Fernandez and Nieto, 2006). However, this finding is conditional upon e. g. the structure of ownership, management behaviour and dynamic of SME growth (see also 1st Intermediary Report, pp.59).

Finally, the cooperation in procurement, production, distribution and marketing between SMEs shall be improved by the instrument "business networks of SMEs". This instrument also tackles SMEs' size-related disadvantages and is intended to increase competitiveness by cost reduction, access to a larger knowledge pool and improved market access as a result of cooperation. The objective is to contribute to growth in turnover and employment.

[14] A more detailed discussion on the support of ICT investments is provided in the 1st Intermediary Report, p. 71.

[15] Regarding the appropriateness of the instrument, see also the discussion in the 1st Intermediary Report, pp. 58.

Overall, the objectives and priorities of the OP are well reflected in the choice of the applied instruments. The logic of intervention is clear-cut for most of the instruments and in line with evidence provided by empirical literature. The composition of the policy mix suggests complementarities, e. g. the support of innovation and assistance to the marketing of innovative products to international markets. The main effects expected from the strategy are an increase in both tangible and intangible capital (RDI investments) leading to an increase in employment, exports and competitiveness. The focus on facilitating investments is also reflected in the financial allocation: the support of R&D activities (collaborative and non-collaborative) and business investments absorb roughly 90% of the budget targeting SMEs.

Some instruments are not unambiguously suited to achieve their objectives, however. For the instruments “e-business in SMEs”, “energy efficiency in SMEs” and “business networks” it is not entirely clear whether the intended effects to safeguard or create jobs are indeed to be realized. All of these instruments aim at cost reductions in order to improve competitiveness. However, such activities may lead to job losses which are due to the fact that introducing new production processes allows firms to produce the same amount of output with less labour input (see Harrison et al., 2008). There may be a positive effect on employment if lower production costs are passed on to consumers. In this case a higher demand may lead to positive employment effects. It seems likely though that in case of SMEs the negative effect on employment outweighs the positive demand effect. Hence, the instruments’ objective may be contradicted by realized effects.

3.1.2. Partnership and consultation

Before the launch of OP Saxony, a broad range of stakeholders was involved in the discussion about the choice of instruments and their design. This included SAB as granting authority (see also section 3.2), chambers and associations as well as trade unions.

With the exception of SAB – which played a special role in this process – stakeholders were involved in a consultancy process, i. e. they provided input on the OP’s design via positional papers or during hearings and conferences.

Moreover, EU legislation requires the establishment of a monitoring committee. The committee’s job is to ascertain that OP Saxony is implemented in due form. Members represent the managing authority, federal ministries (finance and economy), state ministries, EU commission and other above mentioned stakeholders.

3.2. Implementing Bodies

The most important implementing body for the instruments addressing SME growth and innovation is SAB (Sächsische AufbauBank) owned by the Free State Saxony. It plays a significant role in the design and also in the implementation of the OP.

With respect to the design of the instruments, the SAB is actively involved in the preparation of supporting guidelines and in the definition of application criteria for beneficiaries. This is due to the fact that SAB has a long standing experience as central granting authority for business support programmes. SAB therefore accumulated a lot of knowledge about both markets as well as beneficiaries and feeds it back into the process of the instrument design.

In addition, the bank provides information and consulting services to firms in order to improve the efficiency of the application service (see also section 3.3.1). SAB is also responsible for the assessment of project criteria which may be a challenging task in particular for R&D projects. To this end, they employ qualified professionals allowing an appropriate assessment of project specific innovative potentials and risks. Finally, they conduct audits to ensure that funded firms used the received grants in the intended way.

Another institution that was involved in the implementation of the OP is the Saxon Energy Agency (SAENA) which is owned by the Free State Saxony, the Saxon State

Ministry of Finance and SAB. SAENA acted as technical consultant for projects in the realm of the instrument “energy efficiency for SMEs”.

The venture capital fund was developed and managed by an external firm, CFH venture capital, which was appointed by the Free State Saxony after an open call tender.

3.3. Implementation and reprogramming

This section will briefly describe the implementation of the instruments and amendments to the budget allocation.

3.3.1. Implementation

The implementation of the instruments is characterized by a high degree of efficiency (given the standards of legislation) and high demand.

The planned instrument budgets are almost completely committed. The ratio between committed and planned budget ranges between 94.2 (support of investments) and 100 (venture capital). The demand of the firms cannot be tracked precisely as most data refers to the number of approved projects. Our interview partners described the demand mostly as high. One notable exception is the instrument business networks (see also section 4.3.7). After a reduction of the funding rate in 2010 which was undertaken because of the high demand and with the intention to support more firms, the demand dropped massively leading to a phase-out of the instrument.

Among the RDI instruments the highest demand was recorded for collaborative R&D projects (1,182 approved projects), non-collaborative R&D (399 approved projects including innovation vouchers) and technology transfer (98). For the considered period, the ratio between applications and approvals follows a u-shape (PwC, 2014, p. 158). The minimum was reached in 2010 with values of 67% (non-collaborative R&D projects) and 69% (technology transfer). The instrument market access of SMEs was also highly demanded. Already by the end of 2009, the budget was committed to roughly 70% and paid to almost 60% (PwC, 2010, p. 141). In contrast, the demand for the instrument energy efficiency developed very slowly. By the end of 2009, just 6.7% of the budget was committed. But as mentioned already, the MA was satisfied with the demand regarding this project. The VC fund surely had the highest rate of rejection. Up to 2013, 1,150 applications were received by CFH of which just 41 were selected to receive funding. This corresponds to a rejection rate of about 96%.

It became clear during the interviews that beneficiaries characterize the procedure of application mainly as tedious with extensive formal requirements. This was also found by the evaluation of the RDI instruments (PwC, 2014, p. 145). In comparison to other programmes, e. g. ZIM on national level, the ERDF financed instruments impose much higher application costs on enterprises. But the formal requirements are subject to EU legislation which provides not much leeway to the granting authority for an acceleration of the application process.

Regarding the RDI instruments the beneficiaries assess the information quality and staff competency of SAB very positive. The high quota between proposed and approved grant (in 2012 for all programmes over 90%) is a sign for an efficient application procedure, a good communication of application criteria to the potential applicants and a sound consulting on the part of the SAB staff before application.

3.3.2. Reprogramming[16]

The OP has been amended four times during the course of the period 2007-2013 and each change affected SME support.[17] The first change was made in February 2010 and did not affect the budget. It included changes with respect to the design of the

[16] All information presented in this chapter is taken from the four Amendments OP Saxony (2010a, 2010b, 2012, 2013).
[17] A detailed description of the changes made is provided in 0.

instruments technology transfer and support of investments. The changes can be summarized as follows:

- Innovation vouchers were introduced until 2013 as an integrated part of the technology transfer instrument. The intention was to support R&D activities in SMEs in using external R&D services of research centres. This includes activities such as the conduction of market research, proof of concepts but also construction and design activities. The amount of support is comparatively small. The instrument targets mainly SMEs which have to interrupt their R&D activities due to a lack of financial resources.
- Application criteria for support of investments were relaxed. While the initial definition of the instrument only allowed the support of projects that create new jobs, the new definition also allowed projects safeguarding jobs. This was done against the background of the crisis 2009 and the observation that business expansion may not be of interest for firms during an economic contraction. The expanded definition expired in 2011.
- The instrument support of investment was augmented by a revolving fund that distributes subordinated loans to individual enterprises.

The following changes which occurred in 2010, 2012 and 2013, included budget adjustments mostly due to the development of the instruments' demand. The changes increased the budget of Priority Axis 1 in total by EUR 57.09 million while the budget of Priority Axis 3 was decreased in total by roughly EUR 19 million.

Despite the change of application criteria for support of investments, no adjustments were made with particular reference to the crisis. According to interviewees it occurred, however, that budget was shifted from future to present in order to help firms coping with the crisis. An example is the support for R&D activities (instruments 1 – 3). The rationale was to keep the R&D activities in the enterprises alive and to allow firms to finish R&D projects.

Altogether the main motive of budget shifting was high or low demand. With the data from the amendment reports it was however not possible to track changes in budgets of particular instruments completely.

4. EVIDENCE ON ACHIEVEMENTS

This section provides an overview of the applied instruments' achievements and effectiveness[18].

4.1. Measuring achievements

Achievements are measured by two different systems: the monitoring system and independently conducted evaluation studies. While the latter allow gaining an in-depth understanding of the achievements at the level of the beneficiary firm, the former provides insights into the implementation of the OP.

Table 2. Indicators: Degree of achievement OP Saxony 2007 - 2013

Indicator	Unit	Target 2007*	Realized **	Achievement (%)
Axis 1: Strengthening of innovation, science and research				
A. R&D beneficiaries: SMEs	Number	1,350	1,233	91.3
B. Supported total R&D expenditure	Million EUR	1,659	1,040	62.7
C. Safeguarded R&D jobs	Number	6,556	4,323	65.9
D. Created R&D jobs	Number	759	1,204	158.6
E. E-Business Projects	Number	280	468	167.1
Axis 3: Increase the competiveness in the business enterprise sector				
F. Supported enterprises	Number	3,955	9,653	244.1
G. Supported total investments	Million EUR	2,954.5	2,599.3	88.0
H. Supported investment projects: Created Jobs	Number	9,000	8,294	92.2
I. Supported investment projects: Safeguarded Jobs	Number	24,000	41,859	174.4
J. Supported cooperations	Number	385	155	40.3
K. Supported cooperations: integrated SMEs	Number	1,155	516	44.7
L. Supra-regional market access projects of SMEs	Number	1,500	4,733	315.5

Note: * Targets as defined in OP Saxony AIR 2007. ** Cut-off date for Axis 1 indicators 31.10.2014. Cut-off date for Axis 3 indicators 13.4.2015 except indicators J and K (31.10.2014). Indicator A aggregated over instruments 1, 2 and 3 (see Table 1). Indicator B aggregated over 5 instruments of which 4 are related to SME support (instruments 1 to 4). Indicator C aggregated over 3 instruments of which 2 are related to SME support (instruments 1 and 2). Indicator D aggregated over 4 instruments of which 3 are related to SME support (instruments 1, 2 and 4). Indicator F aggregated over instruments 6-9. All aggregated indicators are calculated according to OP Saxony Indicators 2012.
Source: Own elaboration of data provided by the managing authority, OP Saxony AIR 2007.

The monitoring system provides output, result and impact indicators with a strong focus on output (no. of firms/projects, etc.) and results (turnover, costs or employment before and after support). The indicators reflect the level of the instrument and are subsequently aggregated on Axis level. Target values were derived on Axis level by the managing authority on the basis of experience from previous ERDF periods or assumptions on the average project size. Indicators' targets and realisations referring to

[18] Data presented in this chapter are more updated with respect to those included in the OP fiche contained in the Intermediate Report – Volume II.

instruments supporting SME growth and innovation are shown in Table 2.[19] The degree of achievement mainly reflects changes in the budget allocation and effects of the crisis.

With regards to Axis 1 indicators, the number of targeted SMEs is achieved to a high degree, while the targeted R&D expenditure and safeguarded R&D jobs is significantly missed. In contrast, the target values for created R&D jobs and e-business projects have been highly exceeded. The indicators referring to Axis 3 exhibit a higher degree of achievement compared to Axis 1. The number of supported firms significantly exceeds the target which also holds for the number of safeguarded jobs due to investment support and market access projects of SMEs. The target of total investments generated by support as well as the number of created jobs is achieved to a high degree. The low degree of realisation for supported cooperations and the integrated SMEs is due to the phasing-out of the instrument in 2010 (see also section 4.3.7).

For some instruments there are indicators missing which would allow an assessment of the impact, e. g. R&D support or market access (see sections 4.3.1 and 4.3.5). In the case of two instruments (e-business in SMEs, energy efficiency in SMEs) evaluations showed that some indicators were not conclusive. This was due to ambiguous indicator definitions, calculation errors and problems with data collection (see sections 4.3.3 and 4.3.6). Otherwise, the reliability of the indicator data is good. By design, indicators may be blurred by general trends in the economy. If this is true, they do not allow a proper analysis of the instruments' impact in terms of turnover, investment or employment. It is likely for instance, that the low levels of generated investments in R&D are a consequence of the crisis. Uncertainty may have led SMEs to downsize their R&D projects. What is more, indicators depict the achievements at the point of reporting on expenditure of funds. Especially for RDI support it is to expect, however, that effects on the level of the firm or the economy occur with a significant time delay.

Acknowledging the shortcomings of the indicators, several evaluation studies were carried out on instrument level. The evaluation studies were conducted by external experts at different points in time of the financing period.[20] In most cases the external evaluations include a survey among beneficiaries that seeks to identify effects of the support scheme at the enterprise level. This approach may deliver more in-depth results on the effectiveness of the respective instrument compared to the monitoring system, but again the general shortcomings which also limit the validity of the indicators apply. In addition, results of enterprise surveys may be affected by strategic response behaviour of enterprises (may not admit that public support has crowded out private investments).

4.2. Characteristics of the assisted SMEs[21]

In total the instruments supported 7,771 enterprises. This corresponds to roughly 5% of the enterprise population in 2012 in the sectors B to N.[22] 51% of the assisted firms are active in manufacturing industries (see Figure 9). Moreover, 11% of the beneficiary firms are active in construction while 7% are active in information and communication. The surprisingly high share of construction firms is caused by a strong participation of these firms in the instrument "energy efficiency of SMEs". Among the beneficiaries of this instrument, almost 37% are active in the construction sector.

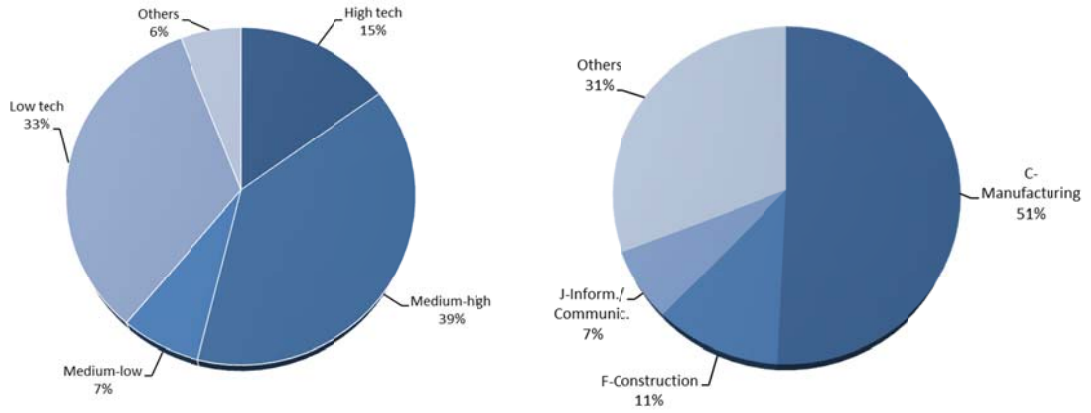
[19] The list of indicators presented in Table 2 is not exhaustive. Some indicators (e. g. supported R&D projects) could not be calculated due to missing data on the instrument level. All available indicators on instrument level are presented in0.

[20] Ongoing evaluations of the instruments on the basis of article 48(3), EU Regulation 1083/2006 were carried out for instruments 6-9 in 2010 (Weigel et al., 2010) and for instruments 1-5 in 2011 (Weigel et al., 2011). Further evaluations of instruments 1-3 have been carried out again in 2011 (Konzack and Horlamus, 2011) and in 2014 (Konzack and Soder, 2014; PwC, 2014). Instrument 4 was subject of a case study by the EU Commission and the EIB in 2015 (FI compass, 2015).

[21] All numbers presented in this chapter do not exclusively refer to SMEs. If the instrument was available for all Saxon firms, large enterprises are included in the data as well. Publicly financed research institutions are also included in the data. A breakdown of the beneficiaries by size was not available. Data on beneficiaries of instrument 6 is only available for beneficiaries of grants. Data on beneficiaries of instrument 4 is not available.

[22] Note that the share of supported enterprises may be significantly lower because of multiple counting. Even though within an instrument multiple counting of beneficiaries can be ruled out, it is likely that beneficiaries using multiple instruments are counted more than once. Research institutions and large enterprises are included.

Figure 9. Breakdown of assisted SMEs with respect to technological intensity and sector of activity



Notes: Information available for 7,771 beneficiaries. Left panel shows breakdown by technological intensity. Category "Others" includes firms from sectors agriculture and fishing, financial services and public services. Assignment to sectors according to industry aggregation presented in 0. Right panel shows breakdown by sector of activity. Category "Others" includes all other sectors.
Source: Own elaboration of data provided by the Managing Authority

Considering the distribution of firms by technological intensity across all instruments of support, almost 40% of the beneficiary firms are active in medium-high technology intensive industries, 33% of the beneficiary firms are active in low tech industries while 15% are active in high-tech industries. Given the OP's objective to strengthen innovation and increase RDI activities, this is a high degree of achievement.

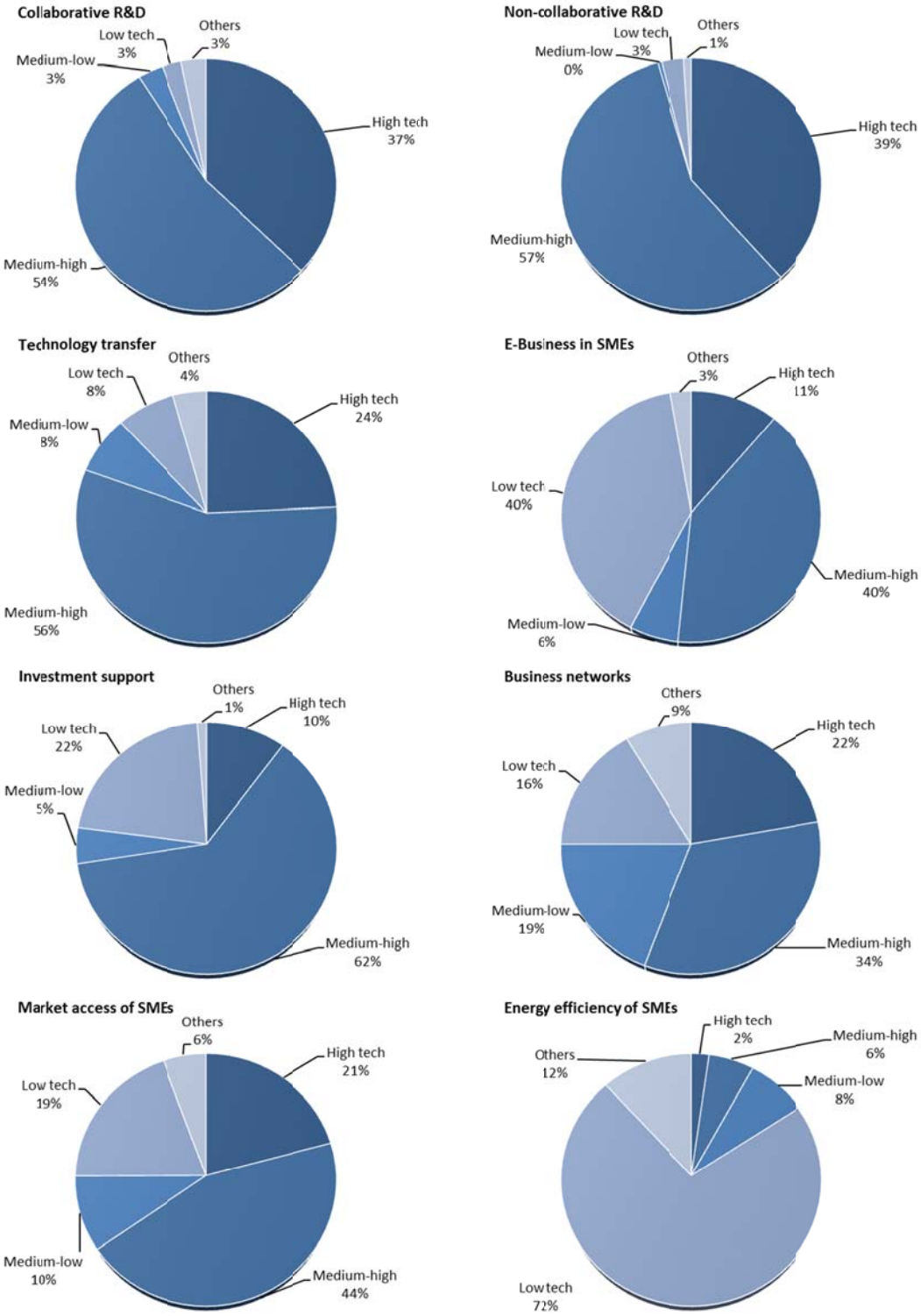
A more detailed look at the distribution of assisted firms by instrument (see Figure 10) reveals that in almost each instrument medium-tech firms are the largest group of beneficiaries. The exception is the instrument "energy efficiency in SMEs" with 72% of assisted firms being low tech firms. This is due to the design of the instrument that targets SMEs in energy – intensive industries which are oftentimes not very technology-intensive.

Considering instruments supporting firms' R&D activities (collaborative R&D, non-collaborative R&D, technology transfer), the combined share of high tech and medium-high tech firms is 80% or higher. High tech and medium-high tech firms also participate strongly in the instruments "investment support" and "market access of SMEs". This is an indication that the OP's strategy to support SMEs along different stages in their life cycle is successful in the sense that firms having developed new products or processes use subsequent instruments, e. g. investment support and market access, in order to commercialize the innovation. There are however no systematic records on multiple use of instruments by beneficiaries.

There is indication that more general instruments, i. e. instruments targeting a larger population of firms and providing smaller aid amounts (technology transfer, e-business, business networks, market access), lead to a higher participation of low tech and medium-low tech firms. Nevertheless, the largest group of beneficiaries among those instruments is still medium-high tech firms.

In a nutshell, the beneficiary structure is to a large extent consistent with the OP's effort to develop a strong manufacturing sector and increase its contribution to gross value added (see section 3.1.1). Even though the instruments are demand-based a lot of assistance was allured by manufacturing firms. With the exception of "energy efficiency in SMEs", the majority of beneficiaries for each instrument are high tech or medium-high tech firms. This is a positive result given the large share of SMEs in less innovative sectors and provides an indication that instruments are well designed to reach the intended target group. Unfortunately, it is not possible to track beneficiaries over more than one instrument. This would be helpful in order to assess the intended complementarities between instruments. Interviews with the MA, the SAB and the beneficiaries provided some evidence that the share of SMEs using multiple instruments is significant.

Figure 10. Breakdown of assisted SMEs with respect to technological intensity by instrument



Notes: Category "Others" includes firms from sectors agriculture and fishing, financial services and public services. Assignment to sectors according to industry aggregation presented in 0. No data available for instruments "Venture capital for young technology firms". Data on instrument "Investment support" includes only beneficiaries of grants. No data on beneficiaries available for "Venture capital for young technology firms".
Source: Own elaboration of data provided by the Managing Authority

4.3. Achievements

In this section the achievements of the instruments will be evaluated. A first assessment will be made upon the basis of the indicator values. Note that indicator targets are available on Axis level only. Therefore, on instrument level we will compare the realized values with planned values which are derived from application forms filled by the beneficiary. In a second step alternative available evidence will be used to provide a concluding assessment.

A general remark has to be made upfront. The database for an unambiguous assessment of the instruments' effectiveness is mostly unavailable. Even though there are evaluation studies, the results oftentimes stem from surveys among beneficiaries which are more or less representative for the total population of beneficiaries. Mostly, the number of respondents is very small. No study compares outcomes of beneficiaries with those of a control group of unsupported firms. Therefore, most results presented here can be considered as anecdotal evidence. If one is really interested in the effectiveness of the instrument, it is inevitable to produce better data, thereby allowing a thorough analysis of the instruments' impact. Data production should be given more weight during the planning of instrument design. Not only characteristics of an instrument are important for its effectiveness, but also the existence of proper and reliable data to verify it.

4.3.1. RDI Support

The logic of intervention within this group of instruments addresses the high financial and technical risk of R&D activities which may prevent SMEs from conducting such activities given their low financial capabilities (see section 3.1.1). Hence, the objectives of the instruments in this category are incentivizing firms to start and to intensify their R&D activities, to enhance cooperation between firms and universities /research centres as well as facilitating growth in turnovers and jobs but also safeguarding jobs.

The evidence of achievement on the basis of the RDI support instruments' indicator values is mixed (see Table 3). An assessment how many firms indeed started R&D activities due to support is not possible because a corresponding indicator is missing. While expenditure and job creation realisation are – in parts substantially – below the expected values before project start, the safeguarding of R&D jobs was to some extent successful. Note, however, that indicator values may present a distorted picture of effects due to R&D support. First of all, the outcome of R&D activities is highly uncertain and may realize with a significant time delay. Hence, the large variation in expected turnover is not very surprising as the target values base on firms' expectations before project start. Uncertainty is even more pronounced in a period affected by the economic crisis. The same argument can be made in case of job creation.

A more in-depth understanding of the effects on beneficiaries is provided by the evaluations (PwC, 2014; Konzack and Soder, 2014; Günther et al., 2013; Konzack and Horlamus, 2011). Unlike the indicator values, the results draw a very positive picture of the impact on beneficiaries and are based on reliable survey data with a high number of respondents among R&D performing enterprises, beneficiary enterprises and research institutions.

First of all, the instruments reach the target group of firms to a high extent (see also section 4.2). The beneficiaries seem to be R&D performing enterprises with increasing R&D expenditure. Almost two thirds of the responding enterprises continuously carry out R&D. Less than 4% of the respondents indicate that they will reduce R&D efforts in the future (PwC, 2014, p. 113). Moreover, there is a positive correlation between the number of R&D performing firms and the utilisation of public support (Konzack and Soder, 2014, p. 19) providing evidence that the instruments in fact incentivize firms to start R&D.[23]

[23] The innovation voucher which was introduced ad hoc in 2010 was evaluated in 2012 (Brandt et al., 2012). The evaluation included an analysis of beneficiary data collected by SAB. Results show that the innovation voucher successfully incentivized SMEs to take up R&D activities. About 74% of the beneficiaries did not receive support public R&D support in the period 2000-2012 other than the innovation voucher (Brandt et al., 2012, pp. 41).

Table 3. Indicator values: Instruments of RDI support[24]

Indicator	Cut-off date	Unit	Plan	Realized	Achievement (%)
Non-collaborative R&D support					
R&D expend. for industrial research	31.10.2014	EUR	266,253,981.40	200,680,308.20	75.4
R&D expend. for experimental development	31.10.2014	EUR	94,359,774.75	75,655,534.61	80.2
Expected turnover	31.10.2014	EUR	2,521,697,030	2,067,957,400	82
R&D beneficiaries: SMEs	31.10.2014	Number	185	185	100
Safeguarded R&D jobs: Total	31.10.2014	Number*	1286.77	1361.58	105.8
Created R&D jobs: Total	31.10.2014	Number*	204.9	164.8	80.4
Existing R&D jobs: Total	31.10.2014	Number*	5,920.1	4,083.17	69
R&D expenditure: Total	31.10.2014	EUR	319,557,324	272,898,130	85.4
Created jobs	31.10.2014	Number*	1,680	715.5	42.6
Collaborative R&D support					
R&D expend. for industrial research	31.10.2014	EUR	640,619,662.90	466,312,791.40	72.8
R&D expend. for experimental development	31.10.2014	EUR	98,306,069.72	57,359,830.23	58.3
Expected turnover	31.10.2014	EUR	4,870,464,323	2,121,937,200	43.6
R&D beneficiaries: SMEs	31.10.2014	Number	605	605	100
R&D beneficiaries: Non-SMEs	31.10.2014	Number	774	774	100
Safeguarded R&D jobs: Total	31.10.2014	Number	3,870.81	2693.97	69.6
Created R&D jobs: Total	31.10.2014	Number*	934.78	686.85	73.5
Existing R&D jobs: Total	31.10.2014	Number*	259,524.89	105,778.65	40.8
R&D expenditure: Total	31.10.2014	EUR	702,964,885	542,194,242	77.1
Created jobs	31.10.2014	Number*	3,903	1,641.56	42.1
Technology transfer					
Expected turnover	31.10.2014	EUR	140,280,200	92,864,600	66.2
R&D beneficiaries: SMEs	31.10.2014	Number	443	443	100
Expend. on technology acquisition	31.10.2014	EUR	22,336,246	12,680,762.81	56.8
Expend. on consultancies	31.10.2014	EUR	8,982,486.57	7,011,445.13	78.1
Start-ups: Total	31.10.2014	Number	4	4	100
Created jobs	31.10.2014	Number*	301	164.25	54.6

Notes: * Number refers to full time equivalents. Column "Plan" refers to values which are derived from application forms filled by the beneficiary before the project start. Column "Realized" refers to values which are derived from reports of expenditure on funds by the beneficiary after the project ended.
Source: Own elaboration of data provided by the Managing Authority

The instruments' intention to increase R&D expenditure is also achieved. The OP support allows most beneficiaries to realize projects earlier and in a larger scale than it would be the case otherwise. Just 1 % of the respondents indicated that the benefit of support did not have an impact on project start or project size (PwC, 2014, pp. 138). For all size classes except micro enterprises a steadily increasing R&D expenditure can be observed among the group of continuously R&D performing SMEs in Saxony over the period 2009 – 2013 (Konzack and Soder, 2014, p. 31). Given the fact that most of these firms are beneficiaries of R&D support, it is likely that the increase was induced to some extent by the instruments.[25]

The objectives of the instruments are congruent with the development of the beneficiaries. The realized impact of completed projects on innovation competences, competitiveness, turnover increase and profitability is positively assessed by respondents.[26] Asked for the expected effects in the future, the respondents are even more positive. With regards to the export share beneficiaries realized and expect practically no impact. This does not imply that the R&D support is not suitable to strengthen international competitiveness which is a prerequisite for successful

[24] The full list of indicators is presented in 0.
[25] The share of beneficiaries of public (regional, national and European) R&D support is over 80% in the group of enterprises continuously performing R&D. More than 80% of beneficiaries receive national support, about 52% regional and 24% European support (Konzack and Soder, 2014, p. 33).
[26] Firms were asked to assess the impact of the project on a scale from 1 to 10 (1: very negative impact, 5: no impact, 10: very positive impact).

internationalisation. But the ability to export is also conditional on other factors. The missing impact on export shares may be an indication of the limited market access of SMEs (PwC, 2014, pp. 127). Growth in terms of employment and turnover occurred among continuously R&D performing firms (Konzack and Soder, 2014, p. 20; see also section 4.4) which are mainly beneficiaries of R&D support.

On grounds of the numerous evaluation results which base on reliable data, the achievements of the instruments dedicated to R&D project support and technology transfer can be assessed as high. The programmes successfully contribute to the increase of R&D activities and to the intensification of existing R&D activities which in result leads to growth in terms of employment and turnover in supported firms. This is also confirmed by the results of our interviews with instruments' beneficiaries.

4.3.2. Venture Capital for young technology firms

The logic of intervention addresses the attenuation of information asymmetries between investors and firms with the objective of increasing equity and thereby positively contributing to innovation and growth.

The impact of the instrument was analysed in 2011 through ongoing evaluation on the basis of indicator values. The evaluation finds that the expected impact – the creation and safeguarding of jobs – was not realized at the date of the evaluation (Weigel et al., 2011, p. 165). Recently the instrument was subject to a case study of the EU Commission and the EIB (FI compass, 2015). Building upon indicator values from the monitoring system and interviews with fond managers, stakeholders and beneficiaries the study concludes that the instrument is successful. The main reasons for the positive assessment are the number of supported companies in the seed (33) and in the start-up phase (19 of which 10 already received support in the seed phase), the strength of the leverage effect (for each EUR of ERDF support the fond was able to raise EUR 3.1 of additional capital) and the number of created (317) and safeguarded jobs (146). The design of the instrument, the capabilities of the Fund management and the alignment of interests among the stakeholders are – according to the study – main determinants of success.

Table 4. Indicator values: Venture capital for young technology firms[27]

Indicator	Cut-off date	Unit	Plan	Realized	Achievement (%)
Expensed equity	31.10.2014	EUR	46,667,000	38,948,584	83.5
Newly created jobs start-up-phase: total	31.10.2014	Number*	244	86	35.3
Safeguarded jobs start-up-phase: male	31.10.2014	Number*	105	118	112.4
Safeguarded jobs start-up-phase: female	31.10.2014	Number*	35	51	145.7
Newly created jobs seed-phase: male	31.10.2014	Number*	272	175	64.3
Newly created jobs seed-phase: female	31.10.2014	Number*	68	72	105.9
Successful investments	31.10.2014	EUR	0	28	-

Notes: * Number refers to full time equivalents. Column "Plan" refers to values which are derived from application forms filled by the beneficiary before the project start. Column "Realized" refers to values which are derived from reports of expenditure on funds by the beneficiary after the project ended.
Source: Own elaboration of data provided by the Managing Authority

At least for the number of jobs created (start-up and seed-phase) it still has to be noted that the realized value is significantly lower than the planned value of 584 (see Table 4). In contrast, the realized number of safeguarded jobs exceeds the planned number. Given the high uncertainty in performance of young firms and the fact that target values are calculated on the basis of beneficiary estimations at the beginning of the investment, the deviation is not surprising.

The available database is very thin and does not allow a conclusive assessment of the instrument's effectiveness. Given the high uncertainty in the early phase of an enterprise life in combination with the economic crisis and the rather medium-term perspectives of an investment, the indicator values may not be a good foundation to judge the

[27] The full list of indicators is presented in 0.

instrument's impact. There are some indications that the instrument is effective though. The private investments raised by the Fund are substantial (EUR 15 million on Fund level and EUR 48.4 million on the level of the beneficiaries which totals EUR 63.4 million) and exceed already the public investment of EUR 45 million (fi compass, 2015; p. 19). Hence, the Fund seems to be successful in attenuating information asymmetries between investors and entrepreneurs. What is more, the Fund had some successful exits already, i. e. enterprise shares were sold to other investors, which implies that supported firms developed positively.

4.3.3. E-Business in SMEs

The logic of intervention is to support the adoption of digital solutions in SMEs by decreasing high investment costs with the objective of strengthening the information society and safeguarding jobs. The indicator values support this assumption as a high number of beneficiaries were supported and the induced project volume in IT is substantial. The average induced IT project volume is about EUR 56,600. The other indicators will not be interpreted for reasons presented below.

Table 5. Indicator values: E-business in SMEs[28]

Indicator	Cut-off date	Unit	Plan	Realized	Achievement (%)
Beneficiaries: SMEs	31.10.2014	Number	469	468	99.8
Induced project volume in IT	31.10.2014	EUR	27,608,304	26,510,802	96.0

Notes: Column "Plan" refers to values which are derived from application forms filled by the beneficiary before the project start. Column "Realized" refers to values which are derived from reports of expenditure on funds by the beneficiary after the project ended.
Source: Own elaboration of data provided by Managing Authority

In 2011 the instrument was evaluated on grounds of the results from a telephone survey among beneficiaries (12 respondents) and indicator values (Weigel et al., 2011). The anecdotal evidence provided by the interviews reveals that all enterprises already used computer and internet in order to trade, to communicate with public administration and also hosted websites before they applied for funding. In that sense, there was no evidence for the assumption that SMEs do not use ICT because of high costs and missing know-how. Still the interviewees indicated that without public support the projects would not have been carried out to the same extent and at a later point in time (Weigel et al., 2011, p. 104).

The indicator system did not allow a meaningful analysis of the instrument's objectives as the definitions of the indicators "expected cost reduction", "expected increase in turnover" and "accelerated business processes" were ambiguous and led to misinterpretation on the side of the beneficiaries. Nevertheless, the evaluation concludes that an intense contribution of the supported projects to the strengthening of the information society can be assumed (Weigel et al., 2011, p. 204).

Given the lack of reliable data at hand, the instrument's achievement cannot be assessed conclusively. But anecdotal evidence provided by interviews with beneficiaries seems to contradict the assumption that SMEs refrain from engaging in ICT activities due to low financial capabilities.

4.3.4. Investment support

The logic of intervention addressed the increase of fixed capital by lowering the costs of investment with the main objective to create new jobs and increase turnovers.

The results of the indicators (see Table 6**Errore. L'origine riferimento non è stata trovata.**) show that among beneficiaries a high share were SMEs (93%). The main share of supported projects was carried out with the objective to erect production plants or to expand existing plants. In general, the instrument's degree of achievement is high.

[28] The full list of indicators is presented in 0.

However, created permanent jobs are significantly below the planned value which is likely to be a result of the change in the application criteria.[29]

The instrument was subject to an evaluation study in 2010 (Weigel et al., 2010) which found the instrument to be productive and recommends to keep the instrument's strategy unchanged (Weigel et al., 2010, p. 112). A survey among beneficiaries (341 respondents) was conducted but even though the number of respondents is relatively high, the population of beneficiaries is not represented appropriately. Therefore the results reflect trends but are not conclusive.

The instrument's objective to increase fixed capital is highly achieved. With EUR 572.3 million committed public expenditure (see Table 6), the instrument generated total investments of EUR 2.6 billion. That is, for each public Euro invested, enterprises invested about EUR 4.54 which is a high degree of additionality.

Table 6. Indicator values: Support of investments[30]

Indicator	Cut-off date	Unit	Plan	Realized	Achievement (%)
Supported enterprises: Micro enterprises	13.04.2015	Number	255	258	101.2
Supported enterprises: Small enterprises	13.04.2015	Number	853	847	99.3
Supported enterprises: Medium enterprises	13.04.2015	Number	269	269	100
Supported enterprises: total	13.04.2015	Number	1,377	1,374	99.8
Supported investment projects: Erections	13.04.2015	Number	320	266	83.1
Supported investment projects: Expansions	13.04.2015	Number	1,434	1,184	82.6
Supported investment projects: Diversification or total change of production process	13.04.2015	Number	403	380	94.3
Supported investment projects: Acquisition of closed down factories or factories threatened by close-down	13.04.2015	Number	13	13	100
Supported investment projects: total	13.04.2015	Number	2,170	1,843	84.9
Start-ups: total	13.04.2015	Number	86	86	100
Supported total volume of investment	13.04.2015	EUR	2,658,928,375	2,599,323,171	97.8
Personnel (before support): total	13.04.2015	Number*	41,113.87	41,858.77	101.8
Created permanent jobs: total	13.04.2015	Number*	12,139.85	8,293.5	68.3

Notes: * Number refers to full time equivalents. Column "Plan" refers to values which are derived from application forms filled by the beneficiary before the project start. Column "Realized" refers to values which are derived from reports of expenditure on funds by the beneficiary after the project ended.
Source: Own elaboration of data provided by the Managing Authority

The objective to increase the number of jobs cannot be assessed conclusively. Undeniably, the instrument supported the creation of more than 8,000 new permanent jobs on the one hand. On the other hand, it may have several detrimental effects which cannot be quantified with the data at hand. First, supported projects may have substituted jobs elsewhere. Second, supported investments may lead to increased competition between Saxon firms. For instance, an investment project undertaken with the motivation to expand production leads to higher output on the side of the supported firm. If this firm competes with other Saxon firms on a regional market – which is likely to be the case in the light of low export shares –, the total output in the market increases. Given a constant demand, this implies falling prices. Unsupported firms may reduce employment in order to secure profitability. Third, the created jobs may not be sustainable as they require to a large extent medium and low-level skills. This was found

[29] In reaction to the crisis 2009, the application criteria for this instrument were relaxed. While the initial definition of the instrument only allowed the support of projects that create new jobs, the broader definition implemented in 2010 also allowed projects safeguarding jobs (see also section 3.3.2).
[30] The full list of indicators is presented in 0.

by Weigel et al. (2010) for the sample of survey respondents.[31] The reason for this is likely the industry structure in Saxony in combination with the focus of investment support on erection and expansion projects which oftentimes occur in manufacturing industries (Weigel et al., 2010, p. 105). Given the high incentives to design more efficient production processes within this sector as well as the frequently occurring off-shoring of medium and low-level qualification jobs, the skill level may not be sufficiently high to guarantee the existence of the created jobs beyond the required minimum of 5 years.[32]

The instrument furthermore has the intention to increase turnover of supported firms. Again, the instrument's achievement in that respect cannot be assessed conclusively due to missing data. Anecdotal evidence exists that this intention could be fulfilled. Weigel et al. (2010) report that after receiving support, about 87% of survey respondents expected an increase in turnover. Almost 60% realized their expectations. Most firms (63%) expected to increase their turnover between 10-50%, 50% realized their expectation. Contrastingly, almost 25% of the firms realized a decrease in turnover which was only expected by 5% of the firms. The reason may be the impact of the crisis which was affecting Saxony at the time of the survey (Weigel et al., 2010, pp. 106).

In brief, it has been found that the instrument's intention to increase fixed capital in Saxony is fulfilled to a high degree. With respect to further objectives, namely increasing employment and turnover growth, a conclusive assessment is not possible given the available data. Even though the gross number of created permanent jobs is high, possible detrimental effects of investment support due to substitution and increased competition may lower the net effect on employment considerably. The anecdotal evidence on turnover growth suggests that a positive impact can be assumed.

4.3.5. Market Access of SMEs

The instrument's logic of intervention is to increase the export share by decreasing costs of market access with the objective of growth in terms of turnover as well as employment.

Relevant indicators are presented in Table 7**Errore. L'origine riferimento non è stata trovata.**. However, on grounds of the indicators it is not possible to assess the instrument's effectiveness. There is neither an indicator reflecting a change in the export share nor an indicator allowing an assessment of turnover and employment growth. Instead the indicators show that a significant number of SMEs were enabled to develop supra-regional business relations, to develop international markets and also to access new markets. This observation can be interpreted in the way that high costs of international market access were sufficiently lowered by instrument's support. Yet, entering new markets has always a long-term perspective which can hardly be depicted with indicators.

[31] To this end, they compared the number of permanent jobs in the year of the project start to the number in the year of the project completion in case the project was already completed (COP). For ongoing projects (ONP) the number of permanent jobs in the year of the project start was compared to the number in the year 2010. More than 50% (ONP: 53.5%, COP: 51%) of the newly created permanent jobs require a medium level of qualification. New jobs requiring high level education accounted for 28% (ONP) and roughly 19% (COP), respectively. 14.8% (ONP) and 26.1% (COP) of the new jobs require low level qualification. The classification of qualification levels refers to ISCED 1997 (International Standard Classification of Education). Level 2 and lower is defined as low level qualification, level 3 is defined as medium level qualification while level 4 and higher is defined as high level qualification.

[32] The funding guidelines require that newly created permanent positions related to the supported investment must be existent for at least 5 years after project completion.

Table 7. Indicator values: Market access of SMEs[33]

Indicator	Cut-off date	Unit	Plan	Realized	Achievement (%)
Supraregional business relations: SMEs	13.04.2015	Number	4,746	4,733	99.7
Market development abroad: SMEs	13.04.2015	Number	2,831	2,781	98.2
Market access projects: Total	13.04.2015	Number	5,521	5,521	100
Serious contact talks	13.04.2015	Number	308,531	308,963	100.1

Notes: Column "Plan" refers to values which are derived from application forms filled by the beneficiary before the project start. Column "Realized" refers to values which are derived from reports of expenditure on funds by the beneficiary after the project ended.
Source: Own elaboration of data provided by the Managing Authority

Again, the database available is not sufficient to assess the effectiveness of the instrument conclusively. There is anecdotal evidence suggesting that export shares increased as a consequence of participation in the program. Weigel et al. (2010) conducted 30 telephone interviews with randomly drawn beneficiaries of the instrument of which 80% managed to increase their export share. The range of increase varied from 2 to 50%. When asked if this increase would have happened without the instrument's support, the average of all answers was 6 on a scale from 1 (very likely) to 10 (very unlikely). 20% of the interviewed firms indicated that without the support their presentation on fairs/exhibitions would have been less professional and representative (Weigel et al., 2010, p. 139). At the same time, 70% of the interviewees indicated that fair/exhibition activities have the strongest impact on their export share (Weigel et al., 2010, p. 140). Since the majority of beneficiaries received support for such activities and that usually a substantial delay is to be expected between fair participation and eventual closing of sales contracts[34], a positive impact on export shares may be expected for the future.

4.3.6. Energy Efficiency In SMEs

The instrument's logic of intervention addresses the increase of fixed capital by decreasing investment costs with the objective of safeguarding employment.

The indicators show that planned values are almost completely reached (see Table 8). The lion share of supported projects was conducted in existing micro enterprises. The comparison of realized turnover before project start and after exhibits that small turnover increases occur. However, the question whether or not the increase in turnover is attributable to the instrument cannot be answered on the basis of the available data.

Recalling that the target group of the instrument are SMEs in energy-intensive industries and thus low-tech firms (see section 3.1.1), the supported total volume of investments of about EUR 63 million is substantial. Since a high number of projects were supported, the average amount of supported total investment of roughly EUR 20,800 is comparatively low. Given the total public expenditure committed to the instrument of EUR 17.7 million, each Euro provided by the instrument allured about EUR 3.56 of private funds which is roughly one Euro less compared to the instrument "support of investment".

Against the background that on the one hand, supported investments are not aiming at expensive new buildings and expansions but at financially small scale investments to increase energy efficiency and the numbers for "support of investment" also include large enterprises on the other hand, the achieved additionality is very good. As there is no data available on employment effects in beneficiary firms, no assessment of achievements with respect to the objective to safeguard jobs is possible.

In a nutshell, the instrument's objective of increasing fixed capital was achieved to a high degree. Whether or not the instrument succeeded in safeguarding jobs cannot be assessed due to missing data.

[33] The full list of indicators is presented in 0.
[34] The remark was made by a representative of SAB.

Table 8. Indicator values: Energy efficiency in SMEs[35]

Indicator	Cut-off date	Unit	Plan	Realized	Achievement (%)
Inv. projects existing firms: Micro ent.	13.04.2015	Number	1,964	1,964	100
Inv. projects existing firms: Small ent.	13.04.2015	Number	670	670	100
Inv. projects existing firms: Medium ent.	13.04.2015	Number	285	285	100
Inv. projects existing firms: Total	13.04.2015	Number	2,919	2,919	100
Supported total volume of investment	13.04.2015	EUR	66,674,707	63,138,019	94.7
Total number of projects	13.04.2015	Number	3,030	3,030	100
Cost savings per year	13.04.2015	EUR	11,588,558.88	11,588,600.10	100
Total number of projects	13.04.2015	Number	3,030	3,030	100
Turnover before project start	13.04.2015	EUR	3,562,044,456	3,247,045,776	91.2
Turnover after project completion	13.04.2015	EUR	3,375,962,769	3,375,964,873	100

Notes: Column "Plan" refers to values which are derived from application forms filled by the beneficiary before the project start. Column "Realized" refers to values which are derived from reports of expenditure on funds by the beneficiary after the project ended.
Source: Own elaboration of data provided by the Managing Authority

4.3.7. Business Networks of SMEs

The instrument's logic of intervention seeks to overcome size-related disadvantages by improving cooperation in procurement, production, distribution and marketing between SMEs with the objective of growth in terms of turnover and employment.

During the interviews with the managing authority and SAB it turned out that the funding rate of the instrument was decreased in February 2010 as a consequence of high demand and the MA's intention to fund more beneficiaries. The normal funding rate was lowered from 65 to 40% while the increased funding rate declined from 80 to 50%.[36] This resulted in a collapsing demand that led the MA to phase-out the instrument. After 2010 no further funds were granted which explains the low number of realized projects.

The strong decrease in demand after the reduction of the funding rate is very surprising. It may be that with reduced funding rates the cost-benefit ratio for firms turned unprofitable, in particular if there is uncertainty about the trustworthiness of cooperation partners and high transaction costs due to coordination problems. On the other hand, a maximum funding rate of 80% is very high and allows involved firms to split a cost share of merely 20% among them. That may give leeway to realize windfall profits. In the light of audits performed by the SAB this seems to be unlikely though. As there is no data available to identify the different motives of the firms, the reasons for the drop in demand remain unclear.

The indicators are presented in Table 9. The planned values are completely achieved for the majority of indicators. However, an assessment of the instrument's effectiveness does not seem appropriate as there are no indicators which provide information on the realized impact of the cooperation on turnover and employment. There is also no indicator which allows an assessment of how the instrument improved cooperation between SMEs.

Complementary data on the instruments effectiveness in improving cooperation between SMEs is contradicting. Weigel et al. (2010) conducted a survey with a very small sample of beneficiaries (28 observations) which is furthermore not representative (Weigel et al.,

[35] The full list of indicators is presented in 0.
[36] Criteria to receive the increased funding rate are i) the center of the network is within a 1st priority region for the "joint task for the improvement of regional economic structures" (GRW) support of economic infrastructure and at least three SMEs are part of the network; ii) the center of the network is within a 1st or 2nd priority region for the GRW support of economic infrastructure and at least one micro enterprise is part of the network or alternatively, the network may consist entirely of micro or small enterprises; iii) the internal project manager is newly employed by one of the participating enterprises.

2010, p. 124). They find that respondents assess cooperation and the communication to be good or very good. In most cases (64%) the trust between cooperating firms improved during the course of the project (Weigel et al., 2010, p. 124). Most firms intended to continue the cooperation in the future (Weigel et al., 2010, p. 125). In contrast to the positive survey results, the interview partners of MA and SAB mentioned that network projects often suffered from coordination problems and a lack of trust between cooperating firms.

Table 9. Indicator values: Business networks of SMEs[37]

Indicator	Cut-off date	Unit	Plan	Realized	Achievement (%)
Integrated enterprises: Micro enterprises	31.10.2014	Number	115	115	100
Integrated enterprises: Small enterprises	31.10.2014	Number	326	321	98.5
Integrated enterprises: Medium enterprises	31.10.2014	Number	80	80	100
Integrated enterprises: Large enterprises	31.10.2014	Number	1	1	100
Cooperations: Production	31.10.2014	Number	32	32	100
Cooperations: Development	31.10.2014	Number	25	25	100
Cooperations: Distribution	31.10.2014	Number	58	58	100
Cooperations: Mix	31.10.2014	Number	40	40	100
SMEs integrated in supported cooperations	31.10.2014	Number	521	516	99
Supported cooperations	31.10.2014	Number	155	155	100

Notes: Column "Plan" refers to values which are derived from application forms filled by the beneficiary before the project start. Column "Realized" refers to values which are derived from reports of expenditure on funds by the beneficiary after the project ended.
Source: Own elaboration of data provided by the Managing Authority

On the basis of the available evidence, the instrument's objective to improve cooperation in procurement, production, distribution and marketing between SMEs cannot be assessed conclusively due to a lack of data and contradicting anecdotal evidence. Missing data also prevents an assessment of the instrument's achievement with respect to employment and turnover growth. The massive drop in demand after the reduction of the funding rate suggests however, that this instrument did not address real needs of the SMEs.

4.4. Mechanisms and conditions for behavioural changes

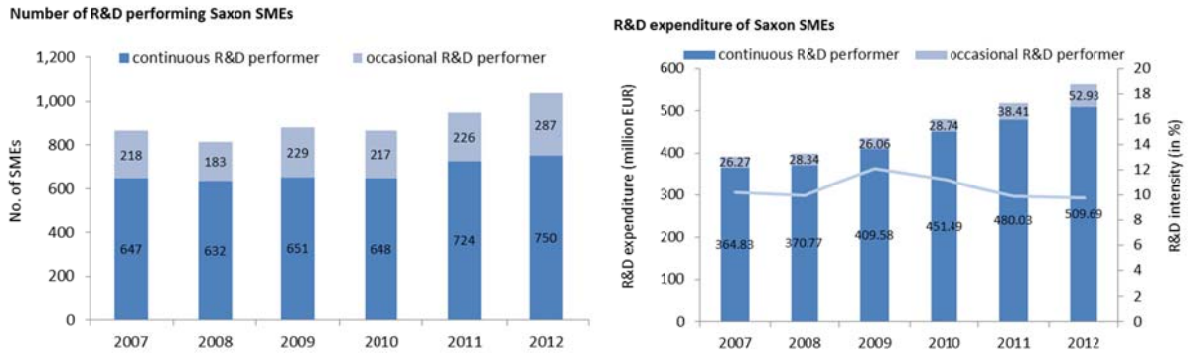
The present section explores the mechanisms and conditions for behavioural change actually evidenced or expected to be triggered by the policy interventions implemented. As the instrument "business networks" was phased-out in 2010, it will not be discussed here.

Recalling the intervention logic of RDI support (see section 3.1.1), a higher number of R&D performers, intensified R&D activities and an increasing cooperation between SMEs and the public R&D sector are the expected behavioural changes.

Figure 11 shows that among Saxon SMEs the number of both occasional and continuous R&D performers increased between 2007 and 2012. Furthermore, R&D expenditure of Saxon SMEs developed very positively. The R&D performing SMEs in the region increased their absolute R&D expenditure from EUR 391 million in 2007 to EUR 562 million in 2012. This increase was mainly spurred by continuous R&D performers. Note that an increasing R&D expenditure can be observed across all size classes of SMEs with the exception of micro enterprises (Konzack and Soder, 2014, p. 31). The R&D intensity – measured as the share of R&D expenditure in sales – remained almost constant with 10.2% in 2007 and 9.8% in 2012. As R&D expenditure increased, this implies a turnover growth among R&D performing SMEs.

[37] The full list of indicators is presented in 0.

Figure 11. Number and R&D expenditure of R&D performing SMEs in Saxony between 2007 and 2012



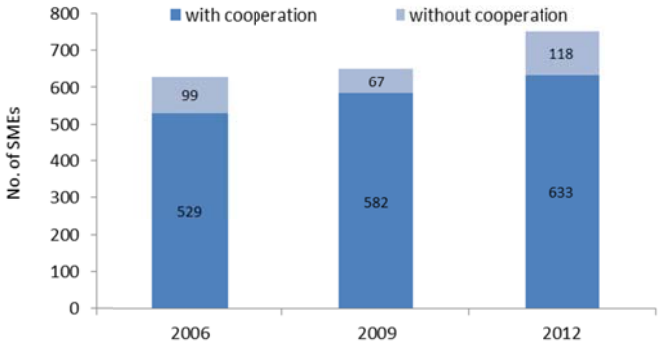
Source: Own elaboration of Konzack and Horlamus (2011) and Konzack and Soder (2014)

R&D performing SMEs in Saxony also experienced employment growth. Konzack and Soder (2014) provide results from a panel analysis of 390 Saxon SMEs in the period between 2009 and 2012. They find that 68.5% of the SMEs grew significantly while 9.5% kept employment unchanged and 22% shrunk (see Konzack and Soder, 2014, p.20).

The instruments supporting RDI activities in OP Saxony also intended to increase cooperation among the firms or with research institutions. Figure 11 exhibits that at least among continuously R&D performing SMEs increasing cooperation behaviour can be observed. The absolute number of cooperating SMEs increased in the period from 2006 to 2012.

Note that in the period 2010 – 2012 about 81% of continuously R&D performing firms in Saxony received public support. More than 80% of those firms receive national support, ca. 52% regional and 24% European support (Konzack and Soder, 2014, p. 33). This implies a substantial impact of OP Saxony on private R&D activities even though it cannot be exactly quantified. On grounds of the presented evidence at beneficiary (see section 4.3.1) and state level, RDI instruments can be assessed as highly effective in achieving the objectives.

Figure 12. Continuously R&D performing firms in Saxony differentiated by cooperation behaviour between 2006 and 2012



Source: Own elaboration of Konzack and Horlamus (2011) and Konzack and Soder (2014)

For the remaining instruments the data availability is less satisfactory and does not allow a concluding assessment of behavioural changes. With respect to the instruments supporting an increase of fixed capital (support of investments, energy efficiency) the logic of intervention suggests that a higher capital stock and an increase of employment should be observed. As section 2.1 shows, this can be observed in Saxony. Undoubtedly, the instrument "support of investments" does have a positive gross impact on employment as the support is conditional upon the creation of new jobs. However, there is no data that would allow an assessment of the net employment effect, as it is possible that substitution effects or increasing competition between Saxon firms due to the

investment support may have led to employment reduction (see section 4.3.4). Therefore it is not possible to quantify the contribution of ERDF financed instruments to the positive development of employment in a convincing way. There are too many other factors which may have had an effect as well (alternative public support schemes, demand, wage level) and the available data does not allow a reliable conclusion. In general, the induced behavioural changes on the level of the region's economy are likely to be limited as the number of beneficiaries is very small in relation to the total enterprise population: The beneficiaries reflect roughly 5% of active enterprises in Saxony (see also section 4.2).

Evidence collected in the interviews with the stakeholders shows that an important mechanism to trigger behavioural changes is the facilitating effect of the OP on SMEs' financial capabilities. Due to their size, SMEs are often financially constrained which constitutes one of the major obstacles to their development and growth. The public support by the OP allows SMEs to carry out investments that would have been carried out not at all, to a smaller extent, postponed or abandoned otherwise. In addition, the OP provides also access to public funding particularly for such SMEs that find the competition or the costs of applying to national or EU funding schemes deterrently high. However, the firms have to take into account that all approved payments by the granting authority are made conditional on the report on expenditure of funds. The auditing of the reports can consume a significant amount of time which needs to be accounted for e. g. in the cash flow calculation. The role of SAB was highly appreciated by stakeholders in this respect: SAB clearly communicates and provides valuable consulting on the requirements of the support and managerial implications. Beneficiary firms also recognized that the comprehensive application procedure for OP funds may be beneficial in the sense that a thorough cost-benefit analysis for the project needs to be conducted. This allows uncovering potential pitfalls and improves the prospects of benefitting from participation in the OP.

The financial capabilities of SMEs also include their access to external capital provided by e. g. banks or investors. In this respect, we observed divergent effects of participating in the OP during our field interviews. SMEs noticed that during the funding period the conditions for external financing improved in general, as interest rates were falling. It was also noted that supported innovation projects may have a positive effect on external financing as these projects enable SMEs to draw upon new commercial potential and thereby improve business perspectives in the mid- and long-term. However, if bridging loans were demanded to finance supported projects, it turned out that banks did not accept approved grants as a security.

Another mechanism that emerged during the interviews with the stakeholders is that participation in the OP raised the awareness towards other supporting schemes on national or European level. Therefore, firms may participate in other supporting schemes in the future or discover previously unknown support programmes for their other activities. The interviews also revealed that raised awareness led to a complementary use of ERDF and ESF funds, e. g. innovation projects were supported by ERDF while innovation assistants were hired or additional training for the staff was provided with funds from ESF.

Given the available evidence on behavioural changes triggered by the implemented instruments, a high degree of achievement is found for instruments supporting RDI activities. We observe a higher number of R&D performers, intensified R&D activities and increasing cooperation. R&D performing SMEs in Saxony also recorded growth in turnover and employment. For the remaining instruments less data is available preventing us from a concluding assessment of the behavioural changes. Interviews with stakeholders revealed that an important mechanism to trigger behavioral changes is the facilitating effect of the OP on SMEs' financial capabilities. By supporting projects that would have been not carried out, downsized, postponed or abandoned otherwise, the OP facilitates investment opportunities. Successful projects improve the commercial prospects of supported SMEs in the mid- and long-term and also improve the access to external capital. Finally, receiving support increased the awareness for the availability of other support programmes on regional, national and European level and also led to complementary use of ESF and ERDF funds.

5. MAIN FINDINGS AND CONCLUSIONS

During the ERDF period 2007 – 2013 Saxony developed positively in terms of GDP per capita, unemployment and R&D performing firms. However, most economic indicator values are still below European or German average. In order to further catch-up Saxony follows a growth strategy that is built around innovation and investment acknowledging their central role for growth, in particular for SMEs. Another central feature of the strategy is its openness, i. e. funds are not allocated towards defined industries but according to project quality and demand. This prevents the support of technologies which may be rejected by markets and instead allows a concentration of support on market driven technologies or products.

Even though ERDF funds decreased compared to the previous period, the total amount spent on the strengthening of innovation, science and research was increased. OP Saxony aims at boosting innovativeness of the economy through investing in enterprises' R&D projects may they be collaborative or non-collaborative. As Saxony hosts diverse and excellent universities, applied research centers and other institutions, technology transfer is in the focus of the action as it is a way to provide private enterprises with valuable R&D input. In addition, a venture capital fund was established to provide equity for young technology oriented firms. OP Saxony aims to improve competitiveness of SMEs in particular by supporting the adoption of ICT solutions, the extension of market development activities, investment in increasing energy efficiency as well as networking among SMEs. The classical barriers for SMEs which also prevail in the region – high risk of R&D, information asymmetries, low financial capabilities – are tackled by OP Saxony.

The applied policy mix in order to reach these goals consisted of both well-established and new instruments of support. The intervention logic is clear-cut for the major share of instruments. For the instruments targeting lower production costs, however, it is not a priori clear that a contribution to the proposed objectives of safeguarding and creating jobs can be accomplished. The operational part of implementation was to a large extent carried out by SAB which constitutes a "one-stop-shop" for beneficiaries. The consulting by SAB with respect to application criteria and formal requirements allowed a high degree of efficiency in the granting process. The relationship between cost and benefit for beneficiaries is reasonable but compared with similar national programmes the application costs are higher for ERDF programmes.

A conclusive assessment regarding the instruments' achievements on the level of beneficiary firms was in most cases either not or merely partially possible given the available data. Oftentimes at least anecdotal evidence is available that suggests objectives were achieved to some extent. Notable exceptions are the RDI supporting instruments for which reliable data is available. It shows a high degree of achievement in increasing the level of R&D among beneficiaries. Also the instruments supporting the increase of fixed capital achieved this objective to a high degree. The mentioned instruments have proven their effectiveness already in previous financing periods and have been extended on grounds of positive evaluation results. Therefore, systematic evaluation at instrument level helps to create a policy mix that effectively distributes funds to SMEs.

Evidence for behavioural changes is merely available for instruments of RDI support. The total number of R&D performers increased as well as total R&D expenditure and cooperation. Furthermore the R&D performing firms grew in terms of employment and turnover. For the remaining instruments available data prevents us from a concluding assessment of the behavioural changes. The instruments aiming at an increase in fixed capital surely contributed to the positive development of investments and employment. It is impossible however, to quantify the impact with the data at hand.

The lack of data is a serious problem for evaluating ERDF instruments. The surveys conducted in evaluation studies are limited to the population of beneficiaries. Mostly, the number of respondents is very small and not representative. No study has been carried out yet which conducts a comparison of target variables – such as turnover or

employment growth - between supported firms and unsupported firms. But this is necessary to obtain reliable evidence on the effectiveness of the applied instruments.

Yet, Saxony provides an example that continuity within the growth strategy pays off. ERDF funds can be used to establish successful supporting instruments for SMEs which help to overcome barriers regarding R&D and investments. This is also highlighted by the fact that an increasing share of supported firms successfully applies to national and European R&D programs where competition is more intense. The significant role of ERDF in achieving these goals was oftentimes stressed during the conducted interviews with stakeholders.

ANNEX

Annex I. Overview of OP Changes

Instrument	Reason and utilisation	Total change
1. Support of non-collaborative R&D	Low demand. The money was partly shifted to Energy efficiency in SMEs. Further budget shifts in favour of collaborative R&D support in 2010 and 2012 but unclear to what extent.	- EUR 23.68 Million (2010)
2. Support of collaborative R&D	Strong demand. The increase was financed by re-allocating budget from support of non-collaborative R&D projects and technology transfer.	+ EUR 20 Million (2012)
3. Technology transfer	See above	/
4. Venture capital for young technology firms	Exhausted investment opportunities. Re-allocated to instruments directly supporting SMEs (see below). Note however that no reduction of the fund measures occurred. The amount had never been invested.	- EUR 19.4 Million (2010)
5. E-Business in SMEs	High demand. Re-allocated from instrument 4. In 2013 the budget was again slightly increased but the exact magnitude is unclear.	+ EUR 3.2 Million (2010)
6. Support of investments	Low demand in the region around Leipzig.	- EUR 29.1 Million EUR (2013)
7. Market access of SMEs	High demand. Re-allocated from instrument 4.	+ EUR 10.6 Million (2013)
8. Energy efficiency in SMEs	Expectation that money cannot be expensed by the end of the period. Re-allocation to Axis 5 and instrument 9. Note that this includes also the funds coming from instrument 1. Further budget reduction (up to 2.7 million) in 2013.	- EUR 5.9 Million (2010)
9. Business networks	High demand. Re-allocation from instrument 4 and instrument 8. Budget reduction (up to 2.7 million) in 2013.	+ EUR 8.4 Million EUR (2010)

Source: Own elaboration of Amendment OP Saxony (2010a, 2010b, 2012, 2013)

Annex II. Sector Classification By Technology Intensity

NACE sector	Technology intensity class	Classification
B: Mining and quarrying	2	Medium-low technology intensity
C10-C12: Manufacture of food products; beverages and tobacco products	1	Low technology intensity
C13_C14: Manufacture of textiles and wearing apparel	2	Medium-low technology intensity
C15: Manufacture of leather and related products	2	Medium-low technology intensity
C16: Manufacture of wood and of products of wood and cork, except furniture; manufacture of articles of straw and plaiting materials	1	Low technology intensity
C17_C18: Manufacture of paper and paper products; printing and reproduction of recorded media	1	Low technology intensity
C19: Manufacture of coke and refined petroleum products	2	Medium-low technology intensity
C20_C21: Manufacture of chemicals and chemical products; basic pharmaceutical products and pharmaceutical preparations	4	High technology intensity
C22: Manufacture of rubber and plastic products	3	Medium-high technology intensity
C23: Manufacture of other non-metallic mineral products	3	Medium-high technology intensity
C24_C25: Manufacture of basic metals and fabricated metal products, except machinery and equipment	3	Medium-high technology intensity
C26_C27: Manufacture of computer, electronic and optical products; manufacture of electrical equipment	3	Medium-high technology intensity
C28: Manufacture of machinery and equipment n.e.c.	3	Medium-high technology intensity
C29_C30: Manufacture of motor vehicles, trailers, semi-trailers and of other transport equipment	4	High technology intensity
C31_C32: Manufacture of furniture; other manufacturing	3	Medium-high technology intensity
C33: Repair and installation of machinery and equipment	3	Medium-high technology intensity
D: Electricity, gas, steam and air conditioning supply	2	Medium-low technology intensity
E: Water supply; sewerage, waste management and remediation activities	2	Medium-low technology intensity
F: Construction	1	Low technology intensity
G45: Wholesale and retail trade and repair of motor vehicles and motorcycles	1	Low technology intensity
G46: Wholesale trade, except of motor vehicles and motorcycles	1	Low technology intensity
G47: Retail trade, except of motor vehicles and motorcycles	1	Low technology intensity
H49: Land transport and transport via pipelines	1	Low technology intensity
H50: Water transport	1	Low technology intensity
H51: Air transport	1	Low technology intensity
H52: Warehousing and support activities for transportation	1	Low technology intensity
H53: Postal and courier activities	1	Low technology intensity
I: Accommodation and food service activities	1	Low technology intensity
I55: Accommodation	1	Low technology intensity
I56: Food and beverage service activities	1	Low technology intensity
J58: Publishing activities	3	Medium-high technology

NACE sector	Technology intensity class	Classification
		intensity
J59: Motion picture, video and television programme production, sound recording and music publishing activities	1	Low technology intensity
J60: Programming and broadcasting activities	1	Low technology intensity
J61: Telecommunications	4	High technology intensity
J62: Computer programming, consultancy and related activities	4	High technology intensity
J63: Information service activities	4	High technology intensity
L: Real estate activities	1	Low technology intensity
L68: Real estate activities	1	Low technology intensity
M69: Legal and accounting activities	4	High technology intensity
M70: Activities of head offices; management consultancy activities	4	High technology intensity
M71: Architectural and engineering activities; technical testing and analysis	4	High technology intensity
M72: Scientific research and development	4	High technology intensity
M73: Advertising and market research	4	High technology intensity
M74: Other professional, scientific and technical activities	4	High technology intensity
M75: Veterinary activities	4	High technology intensity
N77: Rental and leasing activities	1	Low technology intensity
N78: Employment activities	1	Low technology intensity
N79: Travel agency, tour operator reservation service and related activities	1	Low technology intensity
N80: Security and investigation activities	2	Medium-low technology intensity
N81: Services to buildings and landscape activities	2	Medium-low technology intensity
N82: Office administrative, office support and other business support activities	2	Medium-low technology intensity

Notes: Nace code refers to NACE rev. 2.
Source: CSIL

Annex III. Instrument Indicators

Instrument	Indicator	Indicator ID	Cut-off date	Unit	Plan	Realized	Achievement (%)
1. Support of non-collaborative R&D	R&D beneficiaries: Micro enterprises	170	31.10.2014	Number	35	35	100
	R&D beneficiaries: Small enterprises	171	31.10.2014	Number	99	99	100
	R&D beneficiaries: Medium enterprises	172	31.10.2014	Number	51	51	100
	R&D beneficiaries: Large enterprises	179	31.10.2014	Number	71	71	100
	Existing R&D jobs: male	210	31.10.2014	Number*	4,914.6	3,370.22	68.6
	Existing R&D jobs: female	211	31.10.2014	Number*	1,005.5	712.95	70.9
	Safeguarded R&D jobs: male	212	31.10.2014	Number*	1,091.47	1,139.48	104.4
	Safeguarded R&D jobs: female	213	31.10.2014	Number*	195.3	222.1	113.7
	Created R&D jobs: male	214	31.10.2014	Number*	158.8	132.3	83.3
	Created R&D jobs: female	215	31.10.2014	Number*	46.1	32.5	70.5
	R&D expenditure for industrial research	216	31.10.2014	EUR	266,253,981.40	200,680,308.20	75.4
	R&D expenditure for experimental development	217	31.10.2014	EUR	94,359,774.75	75,655,534.61	80.2
	Expected turnover	220	31.10.2014	EUR	2,521,697,030	2,067,957,400	82
	R&D beneficiaries: SMEs	224	31.10.2014	Number	185	185	100
	Safeguarded R&D jobs: Total	240	31.10.2014	Number*	1286.77	1361.58	105.8
	Created R&D jobs: Total	241	31.10.2014	Number*	204.9	164.8	80.4
	Existing R&D jobs: Total	242	31.10.2014	Number*	5,920.1	4,083.17	69
	Supported R&D expenditure: Total	244	31.10.2014	EUR	319,557,324	272,898,130	85.4
	Created jobs	344	31.10.2014	Number*	1,680	715.5	42.6
2. Support of collaborative R&D	R&D beneficiaries: Micro enterprises	170	31.10.2014	Number	78	78	100
	R&D beneficiaries: Small enterprises	171	31.10.2014	Number	306	306	100
	R&D beneficiaries: Medium enterprises	172	31.10.2014	Number	221	221	100
	R&D beneficiaries: Large enterprises	179	31.10.2014	Number	198	198	100
	R&D beneficiaries: Universities	180	31.10.2014	Number	252	252	100
	R&D beneficiaries: Fraunhofer Society	181	31.10.2014	Number	219	219	100
	R&D beneficiaries: Max-Planck Society	182	31.10.2014	Number	1	1	100
	R&D beneficiaries: Other institutions	183	31.10.2014	Number	104	104	100
	Existing R&D jobs: male	210	31.10.2014	Number*	186,120.32	76,768.06	41.3
	Existing R&D jobs: female	211	31.10.2014	Number*	73,404.57	29,010.59	39.5
	Safeguarded R&D jobs: male	212	31.10.2014	Number*	3,218.4	2,168.24	67.4
	Safeguarded R&D jobs: female	213	31.10.2014	Number*	652.41	525.73	80.6
	Created R&D jobs: male	214	31.10.2014	Number*	749.7	532.13	71
	Created R&D jobs: female	215	31.10.2014	Number*	185.08	154.72	83.6
	R&D expenditure for industrial research	216	31.10.2014	EUR	640,619,662.90	466,312,791.40	72.8
	R&D expenditure for experimental development	217	31.10.2014	EUR	98,306,069.72	57,359,830.23	58.3
	Expected turnover	220	31.10.2014	EUR	4,870,464,323	2,121,937,200	43.6
	R&D beneficiaries: SMEs	224	31.10.2014	Number	605	605	100
	R&D beneficiaries: Non-SMEs	230	31.10.2014	Number	774	774	100
	Safeguarded R&D jobs: Total	240	31.10.2014	Number*	3,870.81	2693.97	69.6
	Created R&D jobs: Total	241	31.10.2014	Number*	934.78	686.85	73.5

Instrument	Indicator	Indicator ID	Cut-off date	Unit	Plan	Realized	Achievement (%)
	Existing R&D jobs: Total	242	31.10.2014	Number*	259,524.89	105,778.65	40.8
	R&D expenditure: Total	244	31.10.2014	EUR	702,964,885	542,194,242	77.1
	Created jobs	344	31.10.2014	Number*	3,903	1,641.56	42.1
3. Technology transfer	R&D beneficiaries: Micro enterprises	170	31.10.2014	Number	149	149	100
	R&D beneficiaries: Small enterprises	171	31.10.2014	Number	171	171	100
	R&D beneficiaries: Medium enterprises	172	31.10.2014	Number	123	123	100
	Expected turnover	220	31.10.2014	EUR	140,280,200	92,864,600	66.2
	R&D beneficiaries: SMEs	224	31.10.2014	Number	443	443	100
	Expenditure on technology acquisition	225	31.10.2014	EUR	22,336,246	12,680,762.81	56.8
	Expenditure on consultancies	226	31.10.2014	EUR	8,982,486.57	7,011,445.13	78.1
	Start-ups: male	228	31.10.2014	Number	4	4	100
	Start-ups: Total	239	31.10.2014	Number	4	4	100
	Created jobs	344	31.10.2014	Number*	301	164.25	54.6
4. Venture capital for young technology firms	Expensed equity	367	31.10.2014	EUR	46,667,000	38,948,584	83.5
	Supported enterprises start-up phase: Micro enterprises	372	31.10.2014	Number	0	6	-
	Induced investment seed-phase: Micro enterprises	382	31.10.2014	EUR	0	15,009,208	-
	Induced investment start-up-phase: Micro enterprises	386	31.10.2014	EUR	0	21,382,922	-
	Newly created jobs start-up-phase: male	388	31.10.2014	Number*	183	65	35.5
	Newly created jobs start-up-phase: female	389	31.10.2014	Number*	61	21	34.4
	Newly created jobs start-up-phase: total	390	31.10.2014	Number*	244	86	35.3
	Safeguarded jobs start-up-phase: male	391	31.10.2014	Number*	105	118	112.4
	Safeguarded jobs start-up-phase: female	392	31.10.2014	Number*	35	51	145.7
	Newly created jobs seed-phase: male	393	31.10.2014	Number*	272	175	64.3
	Newly created jobs seed-phase: female	394	31.10.2014	Number*	68	72	105.9
	Successful investments	601	31.10.2014	EUR	0	28	-
5. E-Business in SMEs	Supported projects	36	31.10.2014	Number	469	468	99.8
	Beneficiaries: Micro enterprises	187	31.10.2014	Number	83	83	100
	Beneficiaries: Networks of SMEs	188	31.10.2014	Number	17	17	100
	Beneficiaries: Medium enterprises	189	31.10.2014	Number	187	186	99.5
	Beneficiaries: Small enterprises	190	31.10.2014	Number	199	199	100
	Beneficiaries: SMEs	425	31.10.2014	Number	469	468	99.8
	Induced project volume in IT	426	31.10.2014	EUR	27,608,304	26,510,802	96.0
	Accelerated business processes	427	31.10.2014	Number	911.5	2,551.5	279.9
	Annual costs: Past	428	31.10.2014	EUR	67,024,020.05	581,259,952.50	867.2
	Annual costs: Future	429	31.10.2014	EUR	68,429,486.14	617,787,314.30	902.8
	Expected cost reduction	430	31.10.2014	%	-2.1	-6.3	299.7
	Annual turnover: Past	431	31.10.2014	EUR	397,781,414.80	2,007,996,570.00	504.8
	Annual turnover: Future	432	31.10.2014	EUR	471,892,889.00	2,334,732,680.00	494.8
	Expected turnover increase	433	31.10.2014	%	18.6	16.3	87.3

Instrument	Indicator	Indicator ID	Cut-off date	Unit	Plan	Realized	Achievement (%)
6. Support of investments	Supported enterprises: Micro enterprises	535	13.04.2015	Number	255	258	101.2
	Supported enterprises: Small enterprises	536	13.04.2015	Number	853	847	99.3
	Supported enterprises: Medium enterprises	537	13.04.2015	Number	269	269	100
	Supported enterprises: total	538	13.04.2015	Number	1,377	1,374	99.8
	Supported investment projects: Erections	539	13.04.2015	Number	320	266	83.1
	Supported investment projects: Expansions	540	13.04.2015	Number	1,434	1,184	82.6
	Supported investment projects: Diversification or total change of production process	541	13.04.2015	Number	403	380	94.3
	Supported investment projects: Acquisition of closed down factories or factories threatened by closedown	542	13.04.2015	Number	13	13	100
	Supported investment projects: total	543	13.04.2015	Number	2,170	1,843	84.9
	Start-ups: male	544	13.04.2015	Number	75	76	101.3
	Start-ups: female	545	13.04.2015	Number	11	10	90.9
	Start-ups: total	546	13.04.2015	Number	86	86	100
	Supported total volume of investment	551	13.04.2015	EUR	2,658,928,375	2,599,323,171	97.8
	Personnel (before support): male	552	13.04.2015	Number*	30,046.58	30,711.86	102.2
	Personnel (before support): female	553	13.04.2015	Number*	11,067.29	11,146.94	100.7
	Personnel (before support): total	554	13.04.2015	Number*	41,113.87	41,858.77	101.8
	Created permanent jobs: male	555	13.04.2015	Number*	8,736.85	6,184.75	70.8
	Created permanent jobs: female	556	13.04.2015	Number*	3,403	2,108.75	62.0
	Created permanent jobs: total	557	13.04.2015	Number*	12,139.85	8,293.5	68.3
	Additional apprenticeships	558	13.04.2015	Number*	1,126	643	57.1
7. Market access of SMEs	Supraregional business relations: Micro enterprises	196	13.04.2015	Number	1,512	1,512	100
	Supraregional business relations: Small enterprises	197	13.04.2015	Number	2,050	2,037	99.4
	Supraregional business relations: Medium enterprises	198	13.04.2015	Number	1,184	1,184	100
	Market development abroad: Micro enterprises	199	13.04.2015	Number	805	805	100
	Market development abroad: Small enterprises	200	13.04.2015	Number	1,336	1,296	100
	Market development abroad: Medium enterprises	201	13.04.2015	Number	690	680	98.6
	Supraregional business relations: SMEs	289	13.04.2015	Number	4,746	4,733	99.7
	Market development abroad: SMEs	290	13.04.2015	Number	2,831	2,781	98.2
	Market access projects: Nationwide fairs	291	13.04.2015	Number	3,593	3,593	100
	Market access projects: Foreign fairs	292	13.04.2015	Number	1,337	1,337	100
	Market access projects: Symposiums	293	13.04.2015	Number	135	135	100
	Market access projects: Product presentations	294	13.04.2015	Number	268	268	100
	Market access projects: Consultancies	295	13.04.2015	Number	188	188	100
	Market access projects: Total	296	13.04.2015	Number	5,521	5,521	100
	Serious contact talks	297	13.04.2015	Number	308,531	308,963	100.1

Instrument	Indicator	Indicator ID	Cut-off date	Unit	Plan	Realized	Achievement (%)
8. Energy efficiency in SMEs	Investment projects existing firms: Micro enterprises	585	13.04.2015	Number	1,964	1,964	100
	Investment projects existing firms: Small enterprises	586	13.04.2015	Number	670	670	100
	Investment projects existing firms: Medium enterprises	587	13.04.2015	Number	285	285	100
	Investment projects existing firms: Total	588	13.04.2015	Number	2,919	2,919	100
	Supported total volume of investment	592	13.04.2015	EUR	66,674,707	63,138,019	94.7
	Cost savings per year	597	13.04.2015	EUR	11,588,558.88	11,588,600.10	100
	Total number of projects	599	13.04.2015	Number	3,030	3,030	100
	Investment projects start-ups: Micro enterprises	609	13.04.2015	Number	38	38	100
	Investment projects start-ups: Small enterprises	610	13.04.2015	Number	5	5	100
	Investment projects start-ups: Medium enterprises	611	13.04.2015	Number	4	4	100
	Investment projects start-ups: Total	612	13.04.2015	Number	47	47	100
	Investment demonstration projects: Medium enterprises	615	13.04.2015	Number	1	1	100
	Investment demonstration projects: Total	616	13.04.2015	Number	1	1	100
	Non-investment projects existing firms: Micro enterprises	617	13.04.2015	Number	35	35	100
	Non-investment projects existing firms: Small enterprises	618	13.04.2015	Number	14	14	100
	Non-investment projects existing firms: Medium enterprises	619	13.04.2015	Number	14	14	100
	Non-investment projects existing firms: Total	620	13.04.2015	Number	63	63	100
	Turnover before project start	977	13.04.2015	EUR	3,562,044,456	3,247,045,776	91.2
	Turnover after project completion	977	13.04.2015	EUR	3,375,962,769	3,375,964,873	100
9. Business networks	Integrated enterprises: Micro enterprises	191	31.10.2014	Number	115	115	100
	Integrated enterprises: Small enterprises	192	31.10.2014	Number	326	321	98.5
	Integrated enterprises: Medium enterprises	193	31.10.2014	Number	80	80	100
	Integrated enterprises: Large enterprises	194	31.10.2014	Number	1	1	100
	Cooperations: Production	281	31.10.2014	Number	32	32	100
	Cooperations: Development	282	31.10.2014	Number	25	25	100
	Cooperations: Distribution	283	31.10.2014	Number	58	58	100
	Cooperations: Mix	284	31.10.2014	Number	40	40	100
	SMEs integrated in supported cooperations	286	31.10.2014	Number	521	516	99
	Supported cooperations	287	31.10.2014	Number	155	155	100

Notes: * Number refers to full time equivalents. Column “Plan” refers to values which are derived from application forms filled by the beneficiary before the project start. Column “Realized” refers to values which are derived from reports of expenditure on funds by the beneficiary after the project ended.
Source: Own elaboration of data provided by the Managing Authority

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