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Behind the Myth of the Mittelstand Economy.
The Institutional Environment Supporting Small and Medium-Sized Enterprises in Germany

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North Rhine-Westphalia: Structural Economic Change, Regional Economic and Locational Policy, Ecological Formulation of State Policy - A Survey from the Viewpoint of Advanced Developing Countries

In the face of the globalization process, industrialized and developing countries alike are challenged to devise new economic and environmental strategies geared to interlinking sustainable development, competitiveness, and employment security. Regions are gaining in importance in the world market economy; decentralization is proving to be an essential precondition for successful politics in a globalizing world.

The project centers on analyzing the process of structural economic change and regional economic, locational, and environmental policies in North Rhine-Westphalia; the project is in a position to harness the experience horizons of scholars from three countries (and three continents). There are also plans to work out additional country-specific and/or comparative studies (North Rhine Westphalia/Germany - Chile - Republic of Korea) on key issues of particular significance to the participating institutions (and countries) in the sense of joint learning processes.

The thrust of the study is twofold: (1) Newly industrializing countries (NICs) will be able to learn from the positive and negative experiences made by North Rhine-Westphalia; (2) the analysis conducted by internationally experienced scholars from advanced developing countries can contribute to addressing "regional myopia" in North Rhine-Westphalia, profiting here from the experience of dynamic NICs.

The literature often distinguishes between Anglo-Saxon, "Rhenish," and Asian market economies. The discussion on how different economic styles are changing - showing tendencies more toward convergence or toward even further differentiation - in the globalization process is still in its beginnings. The close cooperation between scholars from three countries / continents can contribute to gaining a better understanding of different types of market economy and thus also of scopes for political action in economic and environmental policy.

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The project’s homepage is located at http://www.meso-nrw.de

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Abbreviations and their explanations

Abbreviation	*Complete name*	*Explanation*
AiF	Arbeitsgemeinschaft industrieller Forschungsvereinigungen	Working Group of Industrial Research Organizations
DFG	Deutsche Forschungs-Gemeinschaft	Federal research council
DtA	Deutsche Ausgleichsbank	Government-owned development bank
EFRE	Europäischer Fond für regionale Entwicklung	European regional development fund
ERP	European Recovery Program	Revolving fund for government-targeted investments, administrated by KfW and DtA
ESF	Europäischer Sozialfonds	European fund for social development
FhG	Fraunhofer Gesellschaft	Applied research organization
FHS	Fachhochschule	University of applied science, normally without courses at postgraduate level
GA	Gemeinschaftsaufgabe zur Förderung der regionalen Wirtschaftsstruktur	Federal regulatory framework for regional policy
GmbH	Gesellschaft mit beschränkter Haftung	Limited liability company
KfW	Kreditanstalt für Wiederaufbau	Government-owned development bank
MPG	Max-Planck-Gesellschaft	Basic research organization
NRW	North Rhine-Westphalia	largest *Land*
REFA	Verband für Arbeitsgestaltung, Betriebsorganisation und Unternehmensentwicklung (founded as “Reichsausschuß für Arbeitszeitermittlung”)	Non-governmental support organization, specialized on basic and ongoing training in industrial engineering
RKW	Rationalisierungs- und Innovationszentrum der Deutschen Wirtschaft (before: Rationalisierungskuratorium der Deutschen Wirtschaft)	Non-governmental support organization, specialized on ongoing training in industrial engineering
TGZ	Technologie- und Gründerzentrum	Technology incubator
ZEW	Zentrum für Europäische Wirtschaftsforschung	Economic think-tank

1 Introduction[1]

The existence of highly dynamic and successful small and medium-sized enterprises (SME) is one of the characteristic features of the German economy. They have been, and continue to be, a growth and a job machine. Their strong performance has raised interest in other countries, with less dynamic SME, which are keen to strengthen their SME sector. Learning from the German experience appears as a promising exercise.

What is essential here is to take a sufficiently wide perspective since it would be inadequate to look at the German SME support policies only. There is a causal link between SME support and the performance of German SME, but there are more such links. Ignoring them would give an inadequate picture of the determinants of SME development in Germany. In order to understand the performance of German SME, it is useful to refer to the concept of systemic competitiveness (Esser et al. 1995).

At the meta-level, there are several elements which create a favorable framework for SME. Probably most importantly, the social status of entrepreneurs is high, and entrepreneurial success is an important means of ascendance to higher social strata. This is embedded in a politico-economic context which is development-oriented, with a strong commitment to creating a very stable macro-economic framework and a business-friendly environment while at the same time alleviating the negative social impact of industrialization, i.e. a social market economy as opposed to a free market economy. It is a widely shared view that the basic organization of the German economy in this respect differs from the Anglo-Saxon variety of contemporary capitalism. Moreover, there are numerous institutions that stabilize macro-economic conditions, such as restrictive rules for prudential banking, which have shielded the German economy from speculative bubbles. There are also institutions which keep transaction costs low, such as a well-developed (and actually SME-friendly) contract law[2] and a well-established system of collective bargaining. In fact, many of the institutions which shape the German economy have been crafted deliberately after World War II to avoid repeating the economic disasters of the 1920s and the early post-war years (hyperinflations in 1922/23 and prior to the monetary reform of 1948, depression after 1929). Others reflect more positive experience, such as the preference given to the social market economy and social security systems which go back to the last quarter of the 19th century.

At the macro-level, conditions for SME are moderately favorable. The macro-economic conditions are generally business-friendly, yet there are some aspects which discriminate against SME. This applies specifically to the tax system. Marginal tax rates on profits are comparatively high (up to 53 %). The effective tax burden can be much lower, as there are all sorts of loopholes, like various means which allow firms to stash away a substantial part of their surplus as a reserve rather than declare it as a profit. However, large firms

1 This paper has been prepared in the context of the joint CEPAL / GTZ Project "Institutional Requirements for Market-Led Structures in Latin America and the Caribbean". For comments on an earlier version we are indebted to Dietrich von Graevenitz, Günther Held, and Jorge Katz. We are also grateful for the permission to publish the English version of this paper as an INEF Report. A Spanish version is going to be published by CEPAL.

2 For an in-depth discussion of this aspect, which we will not pursue further, see Casper (1998).

have much more latitude to use such loopholes than SME.

Another important macro-economic factor is European integration. While there is a certain element of protectionism against non-EU-imports, competition between the European states is fierce, being based on high-quality products, technologically advanced production processes, high quality standards and high qualification of the entrepreneurs and workers. German SME are directing three fourths of their exports to other EU countries. The introduction of the common currency and the integration of East European states into this market will both increase competition and structural change in Germany and create new opportunities for companies.

At the meso-level, it is important to note that there is no specialized SME support institution in Germany. Instead, there is a highly differentiated system of organizations and policies which creates favorable conditions for private business in general and SME in particular. The subsequent sections of this paper will investigate this in detail.

At the micro-level, markets are mostly highly competitive, and the degree of specialization, vertical disintegration and differentiation is high, thus lowering barriers to entry and favoring nimble and flexible SME. There is ample latitude for interfirm cooperation so that SME can overcome disadvantages which are due to a lack of economies of scale. The labor market provides SME with skilled workers, yet their layoff in phases of economic downturn poses major problems. The financial system is offering credit to all types of firms. Access to technology appears not to be a problem, either. Regarding competition, the situation is somewhat different in the craft sector, where barriers to entry which are based on the formal qualification of potential entrepreneurs reduce competitive pressure. At the same time, a high level of skills creates the conditions for constant technical upgrading.

Developing countries and countries in transition generally display grave shortcomings at all these four levels. To understand the competitiveness of SME in Germany, it is not sufficient to focus only at the parameters relevant to competition at all the levels. It is the aim of this paper to demonstrate especially the interrelations and interdependencies between them, which sustain the efforts to build competitive advantages within SME.

It is neither the ‘Developmental State’ nor the market alone that is able to create favorable conditions at all levels, and a dynamic interplay between them. A lot of Latin American countries made this experience in the crises of the import-substitution phase in the 60s and 70s and after the liberalization process, especially in the 80s and 90s. Germany has a range of government support policies at the European, national, regional, and local levels. Manifold public and private institutions are responsible for the implementation of supporting instruments. Chapter 2 will discuss definitions and give an overview of the quantitative importance of SME. Chapter 3 will paint a picture of the employment, qualification, innovation and competition performance of SME in Germany with an added focus on the situation in the new *Länder* (federal states) in the East of the country. Chapter 4 will concentrate on some of the most important intermediary institutions and their organizational forms. Chapter 5 portrays SME support policies at the European, national and regional levels. The last three chapters of this paper will discuss justification and evaluation of SME support, the future of SME development and support policies in Germany, and some conclusions for policy makers in Latin America.

2 The importance of SME in the German economy

Development of German SME received rising attention in the last thirty years. Within the country they were increasingly expected to substitute for job losses in old firms and industries. They are supposed to play a dynamic role in several respects:

- in occupation to substitute for jobs lost due to downsizing of large enterprises;
- in innovation due to their potential of specialization;
- in structural change and the process of globalization because of their flexibility;
- in economic growth due to their export and expansion potential.

Outside the country small and medium enterprises are treated as an equivalent to the label "Made in Germany", which has come to stand for first-class technology, high-quality craftsmanship and export success. In this sense, German SME have the image of being very innovative, disciplined and creative. But this image was the object of controversial discussion in the last years, mainly as a result of comparative studies of German, North American and Japanese SME. In such a perspective, German entrepreneurs were depicted as traditional, paternalistic, technology- but not market- and demand-oriented, and less innovation-oriented than expected. Terms referring to SME as "hidden champions" (Simon 1996) or "problem child" (Heise et al. 1999), and headlines like "Can Germany still innovate?" are reflecting these divergent views. In any case, a heroic view of German SME, taking them as the crucial element of Germany's economic dynamism, is at best only part of a reality which in fact is complex and contradictory.

Contrary to a widespread opinion, the German economy is dominated by large enterprises, although SME have a great share in the number of companies, occupation, and apprenticeship posts. To understand the large-enterprise dominated structure in Germany, which conflicts with the country's reputation in the world, one has to know that a lot of enterprises are large, measured by their turnover and number of employees, even though they share many qualitative features with SME. This is linked with the self-definition of the owners of these firms, but also with the historical and cultural significance of the term *Mittelstand* and its consequences for the classification scheme for SME in Germany.

2.1 The definition of the German term *Mittelstand*: Its qualitative and quantitative aspects

The analysis of SME in Germany requires to understand the meaning of the term *Mittelstand*, since the latter is much more widely used in the country. Its modern definition comprises a number of dimensions and must be distinguished from the Anglo-Saxon expression "small and medium-sized enterprises" (SME). Whereas the term SME mainly focuses on economic units, the expression *Mittelstand* indicates not only a certain group of entrepreneurs but also sociological, historic and psychological aspects.

The *Mittelstand* has its historical roots in the social order of the middle age, where the estates ("Stände", i.e. groups of citizens according to socio-economic status, for example nobility, craftsmen, traders, farmers, etc.) were assigned to special responsibilities This term still points out the position of these entrepreneurs in today's social system of German society. It describes a certain stratum of society, somewhat similar to the meaning of the English term "middle class", but with pre-

industrial connotations. In this sense a definition of a *Mittelstand* company cannot be restricted to the value of its assets, the amount of its turnover or the number of its employees. Just looking at numbers leads into a wrong direction, because it neglects that the *Mittelstand* is characterized by certain convictions and attitudes in the context of socio-economic and political processes. The international economic press and literature increasingly puts attention to these specific characteristics and avoids translating the term *Mittelstand* altogether (Hauser 1998: 1).

As if this were not complicated enough, a further special feature in the German economy has to be mentioned in this context, namely the persistence of a craft sector ("Handwerk"). In pre-industrial times, this sector was highly organized and restrictively governed; in medieval cities, entry into the guilds of the craft sector was tightly controlled, supply was thus limited, and vocational training was regulated. This system came under intense pressure during the 19th century, as it created severe obstacles to the industrialization process. In most parts of Prussia, freedom of economic activity became an established legal right in 1811, but it was restricted again after the revolution of 1848. It was only with the creation of the German Reich in 1871 that the Prussian laws were extended to the whole territory (Kiesewetter 1989). Around 1900, due to the precarious economic situation of and political pressure from small businesses, that freedom was restricted again, and the establishment of chambers of crafts created a dual structure of crafts on the one hand and industries and services on the other. What makes a craft business is defined by law, and even though there is some common understanding, the boundaries are fuzzy, and they are changing over time. Crafts cover both small-scale industry, such as manufacturing of bread or preparation of meat and sausages and many segments of the construction industry (plumbing, electrical installation, installation of heating systems, tiling, etc.), and the service sector, such as car repair, cycle repair, opticians, hairdressers, etc., which means that a substantial part of the retail trade is also part of the craft sector. The sector has specific barriers to entry, since only a *Meister* (i.e. a person who has gone through extensive, multi-year vocational training), or a person who succeeds in hiring a *Meister*, is entitled to run a *Handwerk* firm.

Looking back at history, it is also important to note that industrialization in Germany started spontaneously, influenced by the British experience, but was located initially mostly in those places where water power was available; it was only at a late stage of industrialization in Germany that the steam engine started to play a prominent role (Radkau 1989). It also was only after a protracted period of autonomous evolution of private business that government industrial policy, to some extent pushed by economists such as Friedrich List, became prominent. Accordingly, SME were the seedbed of industrial development in Germany; even the Siemens brothers, Friedrich Krupp and Carl Benz started their businesses this way. This is quite distinct from the situation in developing countries, especially in those countries where economic growth was for a long time based on the extraction of natural resources. In those countries, the insight that even an extended evolution and accumulation in small metalworking companies will not lead to the emergence of a steel industry was one of the motives which led to government industrial policies.

Qualitative aspects

The strong link between enterprise and owner has consistently been emphasized as the most important qualitative aspect of the *Mittelstand*. This relationship finds its expression in

- the identity of ownership and legal responsibility for the enterprise's activities,
- the identity of ownership and liability between the entrepreneur and the enterprise,
- the personal responsibility taken by the entrepreneur himself regarding decision-making.

This strong link between enterprise and entrepreneur is decisive for the enterprise's success or failure. Three quarters of *Mittelstand* companies are family-owned, and a substantial percentage is manufacturing-based. Many of the medium-sized enterprises were founded around the turn of the last century or after the World War II. Their reputation is that

- the founders of these companies were talented innovators, constantly searching for ways to improve their products and to create new ones;
- these enterprises boast a leadership style marked by high social responsibility, strong and personal guidance as well as a close and paternalist relationship with the staff,
- the management style emphasizes long-term results, long-term relationships, highly qualified workers and an ingredient of simplicity, which in a positive view gives the chance of focusing on the essentials of a situation, seeing the forest for the trees. In a negative sense this management style can also lead to the opposite, seeing the trees and not the forest. A lot of *Mittelstand* enterprises entered into crises since they were not able to modernize their hierarchical organizational structure and technology-based products and lacked a clear customer-focus, thus neglecting the demands in their market.

Until now these operational structures have been typical of the *Mittelstand*. There are, of course, differences between sectors and firms. But there are still numerous cases where the qualitative criteria adequately describe the overall enterprise (Muzyka et al. 1997: 148). In this respect, even manufacturing enterprises with more than 500 employees are defined as *Mittelstand* (Hauser 1998: 2).

Although this qualitative definition of the *Mittelstand* has its advantages, especially with respect to the attempt to focalize on the cultural roots and self-definition, it has its limits. As in every other country the SME segment in Germany is very heterogeneous. Today, the identity of ownership and legal responsibility for the entrepreneurs and the enterprises' financial situation is becoming less ubiquitous. The GmbH (limited liability company) is becoming a typical legal form, especially in medium-sized and large enterprises. In future the more successful companies will increasingly organize as joint stock companies. It must be assumed that the legal form of GmbH is primarily chosen in order to restrict the financial risk of the entrepreneur, i.e. in a qualitative perspective they remain, in most cases, classic *Mittelstand* companies despite the legal form.[3]

3 Lageman et al. (1999: 82) observe that the number of GmbHs rose from 122,000 to 513,000 between 1974 and 1998. This applied especially to medium-sized and large enterprises.

Table 1: Classification scheme for small and medium sized enterprises in Germany

Size of enterprise	*Number of Employees*	*Turnover DM/Year*
Small	Up to 9	Up to 1 million
Medium-sized	10 to 499	1 to 100 million
Large	500 and more	100 million and more

(Source: De 1996: 14)

Table 2: Classification scheme for SME in the European Union

Size of Enterprise	*Number of Employees*	*Turnover (ECU)*	*Annual balance sheet (ECU)*	*Share of large firms / holding in equity, %*
Small	Up to 50	Up to 7 million	Up to 5 million	Less than 33
Middle	Up 250	Up to 40 million	Up to 27 million	Less than 33

(Source: Geilen & Vielhaber 1999: 7)

Quantitative aspects

Because of the difficulties of qualitative definition, both researchers and German economic policy-makers use a more pragmatic, quantitative classification for SME. But regardless of the indicators chosen, the quantitative analysis will always be a purpose-oriented approximation which clarifies the examination. In the following sections the definition of *Mittelstand* will be used as a synonym for SME in Germany, bearing in mind the qualitative aspects of the term as well as its heterogeneity and limits.

The usual quantitative classification in Germany applies the criteria "number of employees" and "turnover" to distinguish between small, medium-sized and large enterprises:

This is the common classification within Germany, although sometimes small enterprises are classified as having less than 50 employees. The German government refuses an official classification, pointing at the heterogeneity of SME, the mixture of qualitative and quantitative aspects of the *Mittelstand*, the different criteria in the support programs and at the different classifications of neighboring countries and the EU Commission (Deutscher Bundestag 1970: 2).

The different classifications in the neighboring countries illustrate the variety of definitions in Europe. Whereas in Ireland the upper limit for SME is 50 employees, it is 100 in the Netherlands. In France even enterprises with 1,000 employees are seen as medium-sized ones (De 1996: 12).

Despite all the differences, in 1996 the European Commission defined a minimum consensus for a unified classification in the EU.

This classification does not take into account the different enterprise structures of the European states, especially when comparing the smaller and larger as well as the Northern and Southern countries.[4] While the definition considers more fairly the enterprise structure of the smaller South European member states, it is not adequate for the larger Central and North European countries (Lageman et al. 1999: 40).

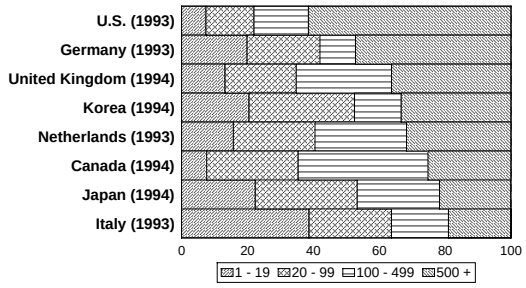
To sum up, a uniform and strictly scientific definition for SME in the EU and Germany does not really exist. The quantitative frame-

4 The EU classification is nearer the classification of many Latin American countries, despite existing differences.

work can be useful if the boundaries of the classifications are not taken too strictly. Especially the attempt of a unified quantitative definition within the EU is worth mentioning. With the internationalization of the economy, a definition within the national context becomes obsolete anyway. Some of Germany's export-oriented medium-sized enterprises have become multinationals in the last twenty years.

Figure 1

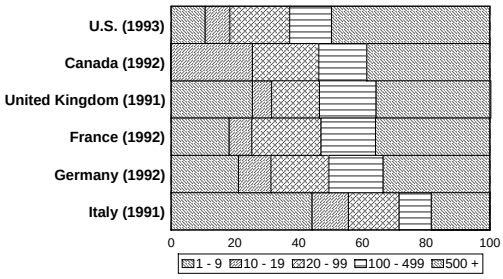
Distribution of employment by firm size: Manufacturing industry



Source: OECD 1998

Figure 2

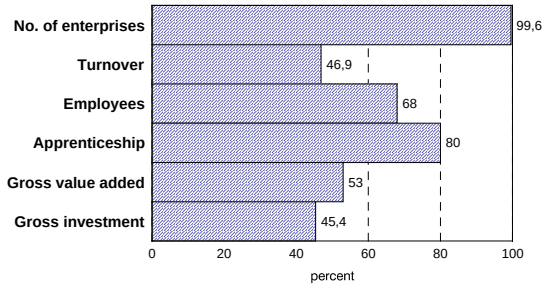
Distribution of employment by firm size: Total non-farm business sector



Source: OECD 1998

Figure 3

Share of SME in German economy (1997)



Source: Hauser 1998

This includes most of the enterprises which have been labeled *hidden champions*, i.e. little-known firms which are highly successful niche players in global markets. To find a more reliable and unified definition for SME in Europe and Germany, it will be inevitable to consider the processes of enterprise expansion (especially within the medium-sized companies) at the global level. This can facilitate the elaboration of more differentiated structural and economic classifications within Germany and the EU. In the following sections this paper will use the German classifications mentioned above.

2.2 The overall economic relevance of the *Mittelstand*

Most of the large OECD economies are dominated by large enterprises, Italy being a notable exception. Figure 1 shows that the share of large firms in manufacturing employment is substantially higher in Germany than in other OECD countries. Looking at the whole of the private sector, the German profile is not much different from that of Canada, the U.K and France (Figure 2). In other words, data do not sustain the view that Germany is a SME economy; if there is a SME economy in Europe, then it is Italy.

Figure 3 indicates the share of SME with respect to different indicators; data on number of enterprises and turnover are based on VAT statistics. A comparison of the VAT statistics from 1970 to 1996 shows a strong increase of the share of large enterprises in turnover. Whereas in 1996 more than 50 % of turnovers were obtained by only 6,277 large enterprises (over DM 100 million turnover), in 1970 it was only 37 %. On the other hand, more than 80 % of the enterprises subject to VAT are small enterprises (up to 1 million turnover), but their share in overall turnover only amounts to 8 % (in 1996). Medium-sized

companies in 1996 represented around 40 % of turnover (but only 19 % of the number), while in 1970 their share in turnover had been 45 %. This evolution emphasizes a tendency towards concentration in turnover and underlines the influence of large enterprises in the German economic system.

2.3 Occupation and job creation in SME

One of the most important arguments in favor of SME support policies in the last twenty years was their potential for occupation and job creation. Data, however, are not always consistent with this argument since data from different sources vary widely. According to one source, which is supposed to have some authority, in the whole of Germany (in 1997) 22 million employees worked in 1.9 million enterprises, 31.6 % of them in small (1-19 employees), 49 % in medium-sized (up to 500 employees) and nearly 20 % in large firms, i.e. no less than 80 % of the employees find their jobs in SME (IFM 1999: 1-2).

To a certain degree, the creative potential in German SME has been able to compensate for the job losses in large enterprises. But keeping the balance was only possible because of rising job offers in the small enterprises with up to 20 employees. Between 1977 and 1997 their share in overall employment increased from a quarter (26 %) to almost a third (31.6 %). During the same time the number of jobs in big enterprises decreased by 19.2 % (Leicht & Strohmeyer 1999). This trend is due to the processes of rationalization, restructuring and outsourcing in those companies which start to focus on their core competencies so as to be more competitive on the national and international markets. This restructuring process also starts in medium-sized companies.

For the sake of both competitiveness and the labor market, small and medium-sized enterprises will have to increase innovativeness and size. But the description above also underlines that SME are the most promising bet in terms of being the job creator in the future, even though it seems unlikely that they will be able to compensate for the overall job losses in the economy.

2.4 Self-employment, start-ups and liquidations

The ratio of self-employment – the number of self-employed per 100 employees – and start-ups are often seen as indicators for the culture of entrepreneurship in a society. In the public discussion, especially the start-ups are seen as the engine and result of structural change, complementing contraction and expansion of existing firms. Start-ups increase competitiveness and dynamism of the economy, indicate the emergence of new innovative branches and are also an indicator of growth and further potential of job creation.

The rate of self-employment in all early industrialized countries has stagnated due to inherent features of the industrialization process and increasing wage occupation. However, there has been an increase in Germany since the mid-1980s.[5] Especially since 1990 the ratio of self-employed has reported ongoing records in comparison with the last two decades. In West Germany it increased from 7.3 % (in 1991) to 9.6 % (in 1998) and in the new *Länder* from 4.6 % (in 1991) to 7.5 % (in

5 In 1990 more than 60 % of the self-employed persons had employees in their business. This is the highest ratio among member states of the OECD (Lageman et al. 1999: 122).

1997). From 1974 to 1996 the overall number of enterprises rose by nearly 20 % (Lageman 1999: 102). Whereas the number of self-employed persons has stagnated in the manufacturing industry, trade, transport and communication sector since 1970, it has been rising continuously since 1983 in the other economic sectors which mainly cover other services (Hauser 1998: 15).

Increasing unemployment is one motive why more persons decide to start their own business. The increasing number of start-ups may also indicate that the entrepreneurial spirit of the population has improved, i.e. that an increasing number of people in Germany are willing to take the risks of self-employment. Another important factor has been "involuntary self-employment", i.e. companies forcing their employees into self-employment to reduce costs, particularly by saving on social security contributions; [6] in this respect it is notable that more than 70 % of new businesses do not have any employees. According to some studies, only one quarter of start-ups are really new enterprises, whereas three quarters involve part-time activities apart from the persons' regular employment or involuntary self-employment (Lageman et al. 1999: 310).

The start-up ratio (number of start-ups relative to number of enterprises) has doubled since the 1970s. At the same time, the number of business liquidations increased. Especially the SME segment is displaying a high turbulence in the sense of a high number of start-ups but also exits. So far, the number of entries exceeds the number of exits. Even though, some observers argue that the number of enterprises has reached a degree of saturation . It will be more important to see which dynamic sectors see start-ups with competitive potential. Focused on the branches, the development shows an increase of start-ups in modern tertiary sectors (Heise et al. 1999: 296).

The start-ups make important contributions to the German economy in terms of job creation, innovation and structural change. Especially in the public discussion the support of start-ups receives lot of attention because of these effects. But their influence should not be overestimated, either. In fact, more than 70 % of new businesses do not create new jobs except for the one of the owner. Among new enterprises, technology-oriented companies have a very small share, i.e. only 0.1 % or 0.5 %, depending on the definition of what high-technology is. For example, among the 530,000 registered new foundations in 1995, only 300 were technology-based, and up to 2,000 were somehow linked to high-technology segments (Lageman et al. 1999: 111). There does exist much more potential, especially in terms of engineers and other academics in universities and research centers who might start their own businesses. It is an important element of support polices to mobilize this potential for new technological based start-ups. Even though they may not have a large impact on job creation, they are very important since they contribute to strengthening the dynamic core of the German economy.

6 The social democratic-green coalition government, which entered office in 1998, has started to counter this trend by forcing involuntary self-employed to contribute to the public retirement fund, provided they meet at least two out of four criteria: no employees, only one customer, an activity which is integrated into another company, and dependent relationship rather than market-mediated transaction. This, however, hit not only involuntary self-employed, such as truckers or hairdressers, but also quite voluntarily self-employed, such as information technology professionals. Since there was an outcry that government is torpedoing its own entrepreneurship promotion activities, technical rules have been redefined to some extent.

2.5 Training and qualification performance of the *Mittelstand*

The *Mittelstand* provides approximately 53 % of the gross value added but employs 80 % of all employees. Thus it has to be assumed that SME produce on average in a more labor intensive way than large enterprises. This comes as no surprise since the domain of the *Mittelstand* is not mass production. Small-scale production and services require a good qualification of the labor force, which is one reason for the fact that the *Mittelstand* employs 68 % of all apprentices. In fact, the *Mittelstand* is the backbone of the German apprenticeship system which is based on a dual vocational training system, where theory is taught in schools and practical training takes place inside the company.

Typical fields of activity of the *Mittelstand*, such as crafts, have substantially increased the number of openings for apprentices since 1990. They thus compensated partially for the overall trend to decrease the number of openings for apprentices. The highest training intensity – trainees per employee – is reported in the construction industry and in the service sector. In terms of size classifications, the highest training intensity can be identified in enterprises with 2 to 19 employees. On the other hand, the expenditures for further training are much higher in large enterprises.

During the twenty years from 1977 to 1996, the structure of vocational training in Germany has changed profoundly. The number of employees without any vocational or university training decreased from 40 % to 30 %. The larger the enterprise, the greater is the share of employees without vocational training. On-the-job-training is common in mass production industries. On the other hand, the larger the enterprise, the higher is the share of polytechnic ("Fachhochschule") and university graduates, which reflects the needs of large companies in modern, knowledge-intensive sectors. The share of higher education graduates in the labor market doubled from 2.6 to 5.8 % and was higher in enterprises with more than 50 employees. At the same time, the share of employees with vocational training increased from 56 % to 64 %. These figures illustrate the tendency of increasing qualification within the economy and reflect the importance and high regard German enterprises give to dynamic advantages like training and qualification (IMF 1999b: 1-2).

2.6 The export performance of SME

German exports in 1998 amounted to DM 950 billion, with imports at DM 821 billion. The main export market for German products is the European Union (around 75 %), followed by the USA, Switzerland, and Japan. The branches with the highest export ratios are the chemical industry (95 %), the automobile sector and the manufacturing of electrical and optical equipment. SME account for 30 % of the direct exports (i.e. not counting their contribution as suppliers); exports as share of turnover are lower in small than in large establishments. A substantial part of small establishments' products are traded via wholesale trade, and many products of small suppliers are integrated into export products of large enterprises. No precise data are available for this kind of export performance.

For SME, the proximity to neighboring countries plays an important role. For example, a quarter of the exports from Germany to Switzerland are coming from the bordering region Baden-Württemberg. The numbers are comparable in other border areas (Bopp 1999: 2).

There is a particularly dynamic group of exporting SME which has been called "hidden

champions" by business writer Hermann Simon (Simon 1996). He investigated 500 medium-sized enterprises and discovered, first, that many of them have a world market share of up to 90 %, and, second, that they are mostly unknown. There are various success factors:

- On the domestic market they figure as medium-sized, but they are global players in their niche.
- Instead of diversifying they concentrate on their core business in a narrow market niche, where they are top performers.
- They concentrate on the demand of their clients, and they are flexible and innovative.
- Instead of outsourcing they trust in their own strengths and prefer to produce in-house.
- Many of them have never been anything but lean and able to focus on the essentials. They are long-term oriented and have suffered remarkably little influence from management fads. In their opinion, buzzwords such as outsourcing, strategic alliances, and time-based competition may be either short-lived fashions or one-sided exaggerations of just one aspect of business.[7]
- Although they tend to have a paternalistic and traditional style of leadership, they focus on a specific aim and are able to integrate and motivate the employees.

Even though they are a small group, such hidden champions can be found in many cities in Germany. They produce highly specialized capital goods, machinery, testing equipment, pharmaceuticals, and other highly knowledge-intensive products. They are a kind of élite of the SME segment.

2.7 SME in the new *Länder*

The economic structure of the new *Länder* is dominated by SME. After reunification, the formerly planned economy underwent, due to its low competitiveness, profound structural change. Large enterprises ("Combinates") were split up and privatized, or closed down. Parallel to this process, lots of small and medium-sized enterprises emerged due to the long-suppressed desire of many citizens to engage in independent business activities. This development was encouraged through strong political support.

A comparison between the size and turnover structure of the new and old *Länder* underlines the differences. While in East Germany enterprises with a turnover of less than DM 5 million account for 43 % of overall turnover, these enterprises only represent 20 % of turnover in the West. In other words, in the old

Table 3: Share of the different size groups in the business turnover of West and East Germany (in 1994)

	East Germany	West Germany
Size	*Share in turnover (%)*	*Share in turnover (%)*
SME / up to DM 5 million p.a.	43	20
SME / up to DM 100 million p.a.	39	28
Large Enterprises	18	52

(Lageman et al. 1999: 145)

7 One of the entrepreneurs was quoted saying: "Remain sober and do not flip over the most recent article on the newest business wonder-medicine." Another commented: "Those who are focused beat those who spread themselves thin." (Simon 1996b: 3)

Länder 0.24 % of all enterprises are large ones, obtaining more than 50 % of overall turnover in 1994. In the East, 270 large enterprises (0.07 % of total) accounted for only 18 % of overall turnover (Lageman et al. 1999: 145).

The ratio of self-employment is increasing more rapidly in the new *Länder* than in the old ones as there was a boom of start-ups after reunification. In 1991 the self-employment ratio was 4.6 % and rose to 7.5 % in 1997. Despite this increase in the formation of new businesses since 1990/91, a growing number of exits can be observed as well. The main reason is the crisis of the construction industry, which boomed directly after the unification, and the shut-down of a many old enterprises, which frequently proved unable to survive in the newly competitive environment.

In the East, the service sector and retail trade account for most small and micro enterprises. Medium-sized enterprises play a greater role in the industrial and construction sector and in wholesale trade. In 1994 only the energy sector was dominated by large enterprises. Nearly 6 % of the enterprises engage in export, mainly to neighboring countries.

3 The innovation potential and efforts of SME

This chapter will address the efforts of German SME in R&D, technology transfer, product and process innovation and inter-firm cooperation. Quite obviously, the innovative potential of SME is important for Germany's economic and social development. Overall indicators are giving evidence to the modernization and upgrading of SME. At the same time, it is also quite obvious that they are fighting an uphill battle, since technological change is accelerating – not only in the narrow sense of new process and product technologies, but also in the wider sense of new concepts for intra-firm management and the management of inter-firm relations.

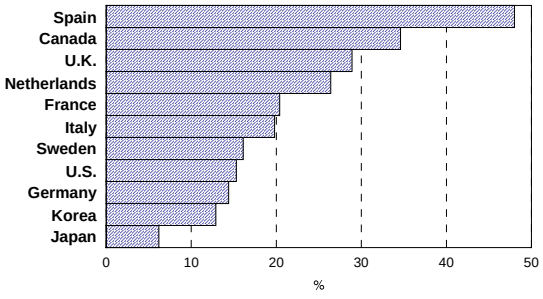
3.1 R&D and technology transfer

In 1995, private sector R&D expenditures in Germany amounted to 3.7 % of overall turnover (DM 57.8 billion). Nearly 90 % of these resources were used for internal research, and just one tenth was spent to finance research at universities and other public research institutes. However, funding of external research by firms is growing. The amount spent on contract research doubled between 1985 to 1995, not least thanks to increasing offers from a range of intermediary institutes, which are described in a subsequent chapter. The share of SME in R&D spending is around 14 %, which is lower than in most other large OECD countries (Figure 4). It is not only that more than 80 % of the amount is spent by large enterprises with more than 500 employees; actually, their share is rising. Enterprises with more than 10,000 employees account for 30 % of R&D expenditure.

Measured by the number of annual patent applications, Germany ranks third in the world,

Figure 4

Share of SME in Business R&D



Source: OECD.

behind Japan and the USA. Whereas SME participation in R&D is relatively low, no less than 80 % of patent applications in Germany come from SME. How can this divergence be explained? The main point is that a patent is both an indicator for input and output of innovation processes. Coming up with a new idea is one thing, and German SME are very strong in this respect. Pursuing this idea, refining it, and turning it into a successful product, is another issue. Another aspect is that large firms tend to have large laboratories, where most of the private sector R&D money is spent, whereas the innovative effort in SME is less organized, and mostly not organizationally separated and accountable, so that aggregated data tend to somewhat underestimate the R&D effort of small firms. And there is the aspect that a large part of SME are craft firms ("Handwerk") which, as a rule, pursue a limited innovation effort, and practically no in-house R&D.

An important detail is that the innovation efforts of SME are much higher in the new *Länder*. Whereas the share of R&D personal in overall SME employment was 5.8 % in 1995, it was 8.8 % in the East. In the West as well as in the East, R&D jobs in SME are especially concentrated in the producer services sector and technology-intensive branches. The development in the East demonstrates that different support programs have had a positive impact.[8]

3.2 Product and process innovation in manufacturing and service sector SME

The panel data of ZEW (the Center for European Economic Research in Mannheim, Germany) give a statistically representative overview of the innovation effort in German firms (ZEW 1999a/b). The share of innovation expenditures in the turnover of SME in the **manufacturing sector** decreased from 5.6 % in 1992 to 3.3 % in 1997. This decrease is mainly the result of insufficient innovation activities in medium-sized enterprises (200-500 employees). In the same period, the share of innovative SME has increased from 56 % in 1992 and 48 % in 1994 to 65 % in 1997. However, this increase is mainly the result of the exit of firms without innovation efforts.

What exactly is behind these tendencies is little understood so far. Industry-level studies

Table 4: Innovation performance of SME in manufacturing

	1992		1993		1994		1995		1996		1997	
	absolute	%	absolute	%	absolute	%	absolute	%	absolute	%	absolute	%
Overall SME	69.628	100	68.494	100	67.721	100	62.815	100	61.339	100	60.124	100
Innovating SME	41.139	59	35.239	51	32.804	48	34.443	55	36.423	59	38.949	65
SME employees (thousands)	3.823	100	3.637	100	3.565	100	3.423	100	3.340	100	3.265	100
Innovating SME employees (thousand)	2.597	68	2.462	68	2.367	66	2.481	72	2.545	76	2.530	77
Innovation expenditure (DM billion)	46		35		28		31		28		27	
Share in turnover in %	5,6		4,3		3,3		3,7		3,3		3,3	

Source: ZEW (1999a).

8 In the East 44 % and in the West 33 % of the R&D personnel works in enterprise-related service sectors and technology intensive branches like medicine-, measurement- and control technology

give some explanation. One observation is that many medium-sized enterprises find it difficult to break with traditional management practices, such as a short-term orientation as opposed to strategic behavior which includes a more systematic innovation effort. Another observation is that many SME which get into crisis and then in the red cut their innovative effort (rather than expand it to be more competitive in the future – short-term survival is more important than long-term competitiveness). Moreover, many SME erroneously believe that their technology is leading-edge anyway so that slowing down efforts to improve on it is tolerable. A new orientation, a model of creating and introducing new products and services based on identified customer needs rather than on the preferences of a firm's engineers, is only slowly gaining ground. The so-called hidden champions are the successful examples that have been able to keep this in mind or that have gone through a successful restructuring process.

At the same time, it is possible to rule out a number of possible explanations. The innovation effort of manufacturing SME is not systematically hampered by certain types of market failures. The technology market appears to work reasonably well. Enforcement of intellectual property rights does not pose major problems. Access to new technologies, in the shape of new equipment or blueprints and patents, is not particularly complicated, either. Information exchange between firms, including exchange between large firms and SME, is working well. Mobility of employees may be somewhat lower than in other countries, since employment is traditionally more stable in Germany than in other OECD countries, but there is no indication that SME are facing major obstacles in recruiting highly qualified employees. Numerous associations and organizations are fostering information exchange (see below); if anything, there is rather an over-supply of information and promotion, which may create substantial transaction costs regarding transparency of information, the effort involved in applying for subsidies, and reporting requirements once a firm has obtained some kind of financial support.

All in all, the innovation effort in the German **service sector** is stable, although contrasting developments have to be mentioned. On the one hand, the innovation activities in modern branches of the service sector – like banks, insurance, technical services, consultancy, services in data processing – are intensified. On the other hand, in the traditional areas of the service sector – like transport, retail and wholesale trade – process and product innovation decreased strongly.

According to the panel data, the number of innovative enterprises in the modern branches of the service sectors increased more than the overall number of enterprises in this branch.[9] The contrasting development also becomes obvious in the ratio of innovation expenditure/turnover. Between 1995 and 1997 it was constantly 1.3 % despite the fact that the enterprises in trade and transport decreased their ratio by as much as 10 %. This tendency will continue due to the economic crisis of the retail sector. On the other hand, the modern branches have increased their effort by 15 % so that their ratio now is 2.5 % (without banks and insurance). Compared to the innovation ratio in the manufacturing industry (5 %) it is still low, but this reflects the generic features

9 According to the research of ZEW the number of innovative enterprises in the modern segment increased from 1996 to 1997 from 160,000 to 163,000, while it decreased in the traditional segment between 1994 to 1997 from 145,000 to 122,000 (ZEW 1999a: 3).

of the service sector, as does the much smaller average size of firms.

The different structure and development of the modern and traditional branch of the service sector becomes also obvious with respect to SME, although the total number of firms between 1994 and 1997 was constant. But in trade and transport the number of innovative firms decreased by 5 %, whereas the number of enterprises in the modern branches increased by 6 %.[10] Service SME innovation expenditure increased continuously to DM 26 billion. Large enterprises, which account for 2 % of the total number, spent DM 20 billion on innovation.

3.3 Innovation in supplier networks and cooperative relationships

As a result of the globalization process and the more knowledge-intensive production needs, cooperation between SME, and between SME and large enterprises, is perceived as increasingly important today. In the research debate, the phenomenon of clusters and industrial districts in countries like Italy received a lot of attention and underlined the importance of different forms of cooperation and supplier relations.[11]

Regarding relations between firms, one can distinguish between horizontal and vertical relations. German industry is characterized mainly by vertical supplier relations. Densely vertically integrated production clusters can be found in different regions in Germany. One of the famous regions in this respect is Baden-Württemberg, where mechanical engineering, automobile production and electrical engineering form the backbone of the regional economy. Although the region is often addressed as the stronghold of SME, the share of employment in large companies is above the average of all West German *Länder* (Semlinger 1995: 17). Two different paths developed independently, but later inter-linked: on the one hand, the development of a centralized and large-enterprise dominated automobile industry; there is an elaborate supplier network of special large enterprises. On the other hand, there is a decentralized *Mittelstand* economy, which is very prominent in machine tool manufacturing. The cluster structure in Baden-Württemberg is often quoted as an example of flexible specialization of SME suppliers. It also demonstrates quite impressively how, by means of vertical inter-firm cooperation, small firms can improve their competitiveness and how a region can develop its innovative potential. But, again, in Baden-Württemberg as well as in other economically important *Länder* (e.g. North Rhine-Westphalia / NRW), the predominant model is one of mainly vertical coordination of supplier relations by a few large enterprises.[12]

In fact, NRW is the most important supplier location in Germany for the automobile sector, with more than 200,000 employees and around 800 suppliers, even though only two final assembly plants are located in the *Land*. Only 5 % of the produced supplier parts are used in NRW whereas 65 % is delivered to other *Länder* in Germany and 30 % to other countries within the European Union. Cooperation initiatives like the VIA NRW (*Verbundinitiative Automobil NRW*), initiated and supported by the State Ministry of Economics,

10 The number of SME decreased in the traditional sector from 228,000 to 216,000, while it increased in the modern branches from 150,000 to 160,000 (ZEW 1999b).

11 Cf. Piore and Sabel (1984), Porter (1990), Sengenberger and Pyke (1992).

12 E.g. Staber (1996), Herrigel (1993), Heidenreich and Krauss (1996), Kremer (1999).

encourage the cooperation between suppliers and large enterprises. Similar initiatives can be found in other *Länder* as well (MWMTV 2000: 1).

The emergence of such initiatives reflects the attempt to increase the competitiveness of regional enterprises, but also the reaction to structural change in inter-firm relations during the last decade. Especially in industry, large enterprises became global players and started global sourcing. Therefore they reduced their reliance on local or other domestic suppliers. Especially in the automobile industry, the implementation of lean manufacturing practices went hand-in-hand with global sourcing. Moreover, large enterprises relocated part of their production activities to low-wage countries. Some large suppliers were able to gain space, establishing themselves as globally preferred suppliers. SME were downgraded in the supplier hierarchy as a result of large firms conducting a selection process and a reduction of the number of suppliers. Accordingly, expectations of new market potentials for small and medium-sized suppliers in the industrial sector through a reduction of vertical integration and outsourcing mostly did not materialize.

The situation is different with respect to producer services. Small enterprises in particular benefited from outsourcing activities in this segment. Large enterprises outsourced simple services like cleaning, but also highly qualified consulting services and data-processing and telecommunication activities.

While vertical cooperation plays an important role in Germany, horizontal cooperation between SME is relatively weak. "Italianate" industrial districts do not really exist in Germany. There are no empirical data which would indicate that the intensity of cooperation between SME has recently increased in comparison to earlier decades. Yet some learning processes can be described. For example, industrial support programs of public and private institutions in Baden-Württemberg (Ministry of Economics, the Steinbeis Foundation and the *Landesgewerbeamt*) intensified their efforts to promote inter-firm and inter-institutional cooperation and had some success (Semlinger 1991: 24ff).

In general, German SME keep their distance from other companies in their respective sector. But this does not mean that horizontal cooperation is negligible in Germany. The opposite is the case. The highly developed institutional infrastructure reduces the necessity and importance of direct cooperation between SME. In the following chapter we will elaborate that institutions like the vocational training system, the efficient work of chambers and employers' associations as well as their high membership reflect a strong division of labor and cooperation. This form of cooperation is highly institutionalized and is different from the kind of collaboration that has been described for Italian industrial districts. When you ask a German SME owner about cooperation between SME, it is not uncommon that he will deny its existence because collaboration in vocational training, of associations and chambers is self-evident in his eyes.

At the same time, more direct cooperation between SME might still set free a great deal of innovation potential . In this respect it is interesting to observe that some authors of recent studies argue that direct cooperation between SME is more intense in East Germany. They ascribe this phenomenon to the crisis and the end of the influence of the old centralized conglomerates, which often hindered interaction. On the one hand, there are mainly weak enterprises, which have to cooperate in order to survive. On the other hand, higher horizontal cooperation in the East is based on dense informal networks which go back to the

German Democratic Republic and are now changing to formal relations in the course of the democratization process (Lageman et al. 1999: 292).

4 The institutional framework for SME support

When SME produce more complex products, they tend to place high demands on the institutional environment at the municipal, regional and national levels. Public and private actors have, individually and jointly, created all kinds of support institutions. Germany has a highly differentiated system of organizations and institutions which support SME at different levels. More recently, the socio-political system has been experiencing the emergence of new forms of organization and governance.

In this section we will portray some important organizations which are working as intermediaries between government and entrepreneurs. It is only a selection of organizations; we have tried to identify those which are particularly relevant. It is impossible to portray all existing institutions. Due to the increasing attention which was given to SME in the last three decades, hundreds of support programs were introduced and more than 1000 organizations work in the field of economic support, mostly in a decentralized way. This may be one of the most important features of the development in SME policies during the last thirty years.

4.1 Government regulation and "Labor Constraint" on Price Competition: Understanding the consensus model in labor relations

What has not changed, though, is that the governance patterns (public or private) are often blurred. The way many German institutions operate can only be explained by the existence of a basic consensus between the private and public sector as well as between unions and employers associations, i.e. by their preference for a social market economy and a problem-solving oriented style of negotiations. Therefore it will be important to mention some factors which shape the comparatively constructive relationship between the state, the employers and employees in Germany. There are especially three components which on the one hand make coordination between the different actors necessary and on the other hand reduce the extent of wage-based competition. The latter, in contrast, is quite typical of newly industrialized countries with more flexible labor markets.

One of the major features of the German political economy is the strength of regulatory constraints on employers, including SME,[13] in the remuneration, use and dismissal of labor. This "labor constraint" includes binding industry-wide agreements over wages and working conditions, a high level of mandatory or state-provided social security benefits and substantial constraints on layoffs (Vitols 1996: 2). The first major component is the extensive set of legally binding sectoral collective bargaining agreements between trade unions and employers' associations. In 1996, more than 30,000 collective bargaining agreements were registered (only a few of which had been really negotiated in negotia-

13 There is, in fact, an unwritten rule that the president of the National Federation of Employers' Associations comes from a Mittelstand company.

tion districts, while the vast majority were adoptions of the first agreements). Furthermore, as early as in the Republic of Weimar in the 1920s, labor law gave extended effect to collective bargaining agreements to all employers in a sector (*Allgemeinverbindlichkeitserklärung*).
When employers accounting for at least 50 % of the employees in an industry belong to an employers' association, collective bargaining agreements between the union and this association may be declared legally binding by the Labor Ministry on all companies in the sector. An estimated 90 % of all employees in industry are covered by such collective bargaining agreements; in contrast with the experience in most other industrialized countries where union influence has weakened, this proportion did not decrease during the 1980s.

One indicator of the strength of the labor constraint on employee compensation is the low level of wage differentiation in Germany, which reflects low variation in wage rates across firms in industries and moderate wage gaps between semi-skilled and skilled workers on the one hand and production and non-production workers on the other. Employees in the lowest earnings decile received 65 % of the earnings of the fifth decile as compared to 61 % for Japan, 59 % for the UK and 40 % for the U.S. (Vitols 1996: 4, Streeck 1996). In the 1980s Germany was the only OECD country where wage differentiation became less pronounced. This is especially important for small and medium-sized firms. Wages in small firms in Germany are only about 10 to 15 % lower than in large firms, compared to 20 to 25 % in the UK and France, and 30 % in the USA. This means that competition based on labor cost is restricted for SME, which, in turn, generates a "*productivity whip*" (Meidner 1974) on companies, particularly export oriented SME. As a result, less productive firms are forced to modernize or go out of business.

A second component of the labor constraint is the great degree to which non-wage costs are determined by mandatory or publicly provided "fringe benefits". Unemployment benefits and state pensions, which are financed through mandatory contributions, are generous in comparison. Social security contributions as a percentage of income in Germany are among the highest among major OECD countries. Minimum service levels are set and fees regulated for health insurance, which is also co-financed by employer and employee. Since the early 1960s, employers have also been required to fully finance 100 % of net pay for six weeks in case of illness.

Whereas the collective bargaining model is based on the supra-firm level, the third component of the consensus-encouraging mechanism inside the firm is the strong legal rights granted to works councils that represent employees at the shop-floor level. These works councils have wide-ranging information, consultation, and co-determination rights, including rights in the areas of introduction of new technology and workplace organization, hiring and firing, and overtime and short-time work. Employees in any firm with more than 50 employees are entitled to establish a works council, and there is a rule which establishes that , in proportion to the number of employees, a certain number of employees can dedicate themselves full-time to works council matters.

The ability of works councils to influence industrial adjustment were considerably extended in the 1972 revision of the Works Constitution Act; this reform granted works councils the right to be informed of impending mass layoffs and to negotiate social plans regulating mass layoffs. Social plans (*Sozialpläne*) cover employer obligations for re-

training, redeployment to other plants or subsidiaries of the firm, for severance pay and early retirement pensions. As a result of these rights, works councils can effectively constrain employers to quickly reduce the workforce through restructuring or during downturns in demand.

In summary, the three mentioned components of labor regulation constrain the extent to which employers can pursue price-competition strategies. This pressure is especially high on SME, which in other countries overcome some of their disadvantages in comparison to large firms with lower labor costs and greater flexibility in the use of labor. At the same time, these constraints encourage high-quality competition through modernization at the firm level. Moreover, they encouraged and forced the private actors to form collective bargaining and consensus-building structures (Vitols 1996: 5).

4.2 Training and research institutions

Research and training institutions like the dual vocational training system, the infrastructure of higher education institutions (universities and *Fachhochschulen*), and specialized R&D institutions play a key role in Germany's competitive advantage regarding the production of high-quality and internationally recognized manufactured goods. Training and research depends on a set of socio-economic institutions like banks, collective bargaining institutions, and others that encourage and support long-term commitments by labor and capital. Its high output of skilled and well-educated employees and engineers is widely recognized as the basis for Germany's export success and innovation.

4.2.1. The dual vocational training system

The apprenticeship system is the major provider of vocational training in Germany. The German model of high quality production is highly dependent on it. It provides comprehensive theoretical and practical training through the "dual system" for about 70 % of German adolescents, typically of an age between 15 and 20 years (Wagner 1998: 2). Most of them (85 %) enter the apprenticeship after nine or ten years of schooling, whereas around 15 % have already passed 13 years of schooling which provide the university entrance certificate. The final certificate of apprenticeship is accepted as an important career step in Germany. The first degree usually takes three years of dual learning, i.e. theoretical instruction at public vocational schools

Table 5: **Percentage of plants with apprentice training according to industry in West Germany**

Industry	*Plants offering training in % of all plants (1995)*
Metal working	33.6
Precision engineering, optics, watches	34.7
Leather, textile, food	32.6
Trade	16.9
Traffic, communication	10.3
Banks, insurance	18.8
Services	24.1
Total	23.7

Source: Wagner (1998: 21)

and practical training within the enterprises. Afterwards, skilled workers who want to continue their career have two options: Either they take and pass a *Meister* (supervisor / instructor) or technician examination after at least two years of experience or they go to university for further studies.

Meister exams have been developed for different industrial and craft areas. A great variety of other further education with similar reputation exists in other sectors. This kind of career is an important incentive for better qualified young people to enter the dual system as they can move into supervisory or middle management positions without having to complete the time-consuming and demanding higher educational track. Under German law, the *Meister* certificate is even a prerequisite to manage a craft business. The latter is an important reason for the high quality reputation of the German craft sector and its products and services. About 20 % of apprenticeship graduates subsequently pursue a *Meister* or a technician training. (Wagner 1998: 24)

The German vocational system is based on cooperation and consent by employers, trade unions, and the government. In 1995, 24 % of enterprises provided apprenticeships (Table 5).

The apprenticeship training system is supervised by the chambers. They are also responsible for the examinations. At the same time the chambers, trade unions and employer associations manage external training centers which offer training modules that the companies themselves cannot provide. The state also supports the establishment of these centers and thus makes up for a market failure or fills a gap in a company's training capacity.

The vocational system is based on cooperation between the different actors which secures a reasonable relationship between demand and supply at the market for apprenticeship posts. Accordingly, the supply of apprenticeship places has historically closely followed demand in recent history in West Germany.[14] Especially the elastic reaction of the system is often mentioned as a very positive feature, although the imbalance between demand and supply has increased in the 1990s. In the last decade the pressures have shifted from the demand-side (not enough young people seeking to fill apprentice openings between 1990 and 1992) to the supply-side (not enough apprenticeship places since 1993). Statistical analysis shows that the vast majority of these changes can be explained by demographic changes and structural changes in the economy (Wagner 1998: 26). However, there is an ongoing debate about the lack of flexibility within the system.

In this respect, the sluggish reaction of the system to the emergence of new types of jobs, for instance in the multimedia sector, is worth mentioning. There is a straightforward problem behind: The structure of the apprenticeship system, including the type of training profiles offered, is negotiated between chambers, employers' associations, and trade unions. New industries, such as multimedia, tend to have a low degree of organization at both the employers' and employees' side. Therefore, the well-established system does not

14 After reunification chambers had to be built up in the new federal states. Trade unions and employers' associations moved to East Germany and helped to set up the new system. For further compensation of existing deficits in the training facilities, external training centers were instituted with a high financial public support. Despite this transfer of institutions the number of apprenticeship places is not yet sufficient but adjustments to the West German working environment are taking place in the new federal states.

Table 6: The five institutional columns of public financed R&D infrastructure

Institution	*Helmholtz Centers*	*Max Planck institutes*	*Leibniz institutes (Blue List)*	*Fraunhofer Gesellschaft*	*German Research Council*
Number of facilities	16	80	82	47	1
Personnel	~ 23,000	~ 11,000	~ 10,000	~ 9,000	
Research profile	Basic research	Basic research	R&D and Service institutions without clear profile	Applied research and development	central public funding organization for academic research

Source: Stamm (1999: 20)

work adequately in such sectors. The perverse result is that jobs which would under normal circumstances cater to individuals with an appropriate apprenticeship degree are being filled with university graduates, who have gone through a much more time-consuming training and acquired various sorts of skills which they cannot use in such a job. In other words, the whole system works excellently in routine situations but has inherent problems in cases of radical change.

4.2.2. Universities, Polytechnics and Colleges

Since the beginning of the 19th century the universities have been playing an important role both in the provision of qualified personnel and in scientific research. Whereas the traditional universities concentrate on pure research, the technical universities or polytechnics engage in a more application-oriented research. Since there is a need for more engineers and higher technical skills, a high number of colleges and polytechnics (*Fachhochschulen*) has emerged since the beginning of the 1970s. The *Fachhochschulen* were initially closely oriented towards the economic sectors of the respective region and their need of engineers. They still focus on education and technical skills rather than on theory and research.

At the end of the 1990s, around 1.9 million students were enrolled at 113 universities, 46 universities of arts and 114 *Fachhochschulen* or similar institutions. Research and education are mainly financed by the *Länder*, whereas the participation of the private sector increased from 3 % to 8.2 % between 1982 and 1997. The universities and *Fachhochschulen* spend around 14 billion DM p.a. for R&D. 29 % of these expenditures is spent on natural sciences, followed by medicine (23.4 %), social sciences (20.7 %) and engineering science (20.3 %) (Stamm 1999: 17).

The organizational structure of German universities is important for an understanding of the research and transfer system. The various schools (faculties) are the major bodies in charge of the distribution of institutional funds for teaching and research. These schools comprise a number of chairs responsible for different areas of teaching. Several chairs often establish institutes where the professors organize research. The status of theses institutes varies widely from completely independent institutes to closely linked ones. Often the institutes' research is financed and performed jointly with the promoting organizations (Spielkamp & Vopel 1997: 17).

It is important to note that there is little dispute that German universities are in urgent

need of reform. "Freedom of science" and performance supervision used to be played against each other, with the latter losing out. It was only recently that performance indicators have been introduced. Nevertheless, the university professor who reaches tenure cannot be dismissed or suffer other types of sanctions in case of inadequate performance. Accordingly, the performance varies widely, and overall quality has suffered, even more so since the substantial expansion of the number of students has not been accompanied by a parallel expansion of teaching staff.

4.2.3. Public and private research organizations

a) Public research institutions

All over Germany there are 225 publicly funded research institutes which belong to four groups of research centers. Apart from the universities these institutes and the German Research Council (*Deutsche Forschungsgesellschaft, DFG)* constitute the five columns of the publicly financed institutional R&D infrastructure in Germany.

The Max Planck Society is a sponsoring organization and comprises institutes all over –ermany (with 27 institutes located in the new federal *Länder*). It was created as the "Kaiser-Wilhelm-Gesellschaft" about a hundred years ago. The MPG is mainly engaged in basic research in selected areas of natural science, but also in law, social sciences, and arts. The Society picks up especially new, promising research topics which have not yet met with adequate response at universities. The MPG cooperates with universities and provides them with major appliances. The expenditures in 1995 amounted to DM 1,708 million. Overall staff amounts to 11,500 employees, among them 3,015 scientists.

The Fraunhofer Gesellschaft (FhG) is a non-profit organization with 47 institutes for applied research all over the country and a total staff of around 9,000, most of them scientists and engineers. International collaboration is promoted through Fraunhofer branches in the USA and in Asia. Carrying out contract research projects for the business and the public sector, the FhG contributes to transfer results of basic research into practice. The institutional promotion by the federal government and the *Länder*, which usually amounts to 20 % of the total budget of a given institute, enables the FhG to address self-chosen research topics for securing their scientific potential and the development of new technologies and their constant observation. The FhG offers firms and public authorities its services in different areas, among others in microelectronics, process engineering, environment, and health. The close relationship to universities is institutionalized through the joint appointment of Fraunhofer directors as tenured university professors.

The Helmholtz Centers, like most of the other research facilities, are mainly financed by the federal government and especially by the Federal Ministry of Education and Research. The special aim of each of the 16 Helmholtz Centers research is to use large-scale equipment with a focus on specific priority topics, primarily large accelerators, neutron and synchrotron sources, as well as observatories and telescopes. In research projects and as partners for universities and other research institutes the Helmholtz Centers contribute significantly to long-term basic research in several fields of natural sciences.

Next to the major research facilities of the Max Planck Society and the Fraunhofer Society, the federal government and the *Länder* together promote research facilities and fa-

cilities with a service function. The "Blue List" contains more than 80 facilities which are also addressed as the "Leibniz Society". These research institutions are not a uniform group. At the end of the 1980s there were 15 institutions with service functions like museums and special libraries, 15 social science institutions and 16 research institutions in natural science, engineering science and medicine. After German unification the number of "Blue List" institutes increased strongly to 82. In contrast to the earlier mentioned societies, which have some kind of common philosophy, the Leibniz Society comprises otherwise unrelated institutions. Around 23,000 people worked in these organizations in 1998.

The German Research Council (DFG) is the major promoting organization and self-government for science and research activities in Germany. One of its main tasks is financial support for research projects, support for research cooperations, and the promotion of junior researchers. Moreover it is an important advisor in terms of science policy-making. The DFG also develops and maintains the relations to and cooperates with international research institutions (Spielkamp & Vopel 1997: 16 ff).

b) Privately organized industrial research organizations

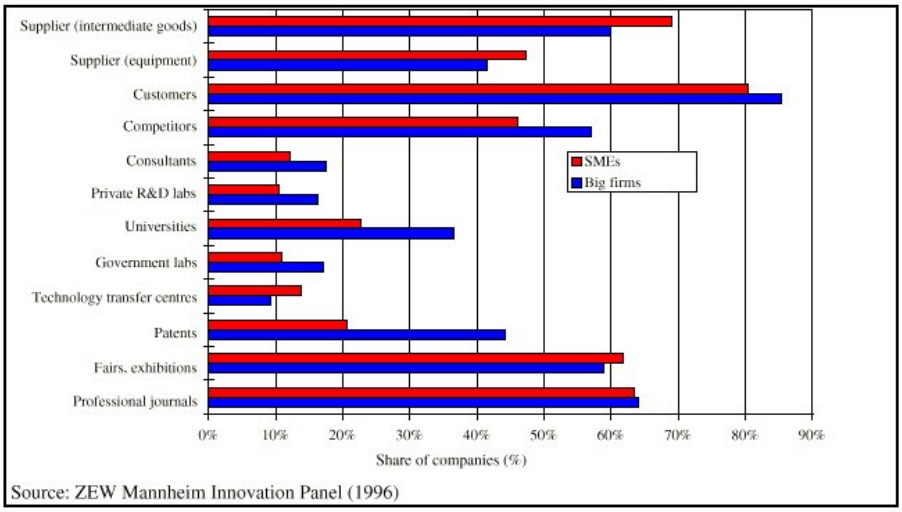
Industry-wide R&D exists in industrial research organizations mainly according to the different economic sectors in Germany. Both industry associations, which are responsible for promoting the interests of companies in a sector as a whole, and professional associations, which represent engineers in at present 107 such organizations, are assembled under the umbrella of the Working Group of Industrial Research Organizations (*Arbeitsgemeinschaft industrieller Forschungsvereinigungen*, AiF). AiF promotes applied research and development mainly to support small and medium-sized firms. Since this organization keeps a spirit of community and common interest, the activities focus on industries and branches. It receives joint funding from the Federal Ministry of Economics and Industry.

4.2.4. SME and R&D

SME are much less likely to interact with R&D institutions than large firms (Figure 5 and 6). The opposite might be expected since large firms can afford there own R&D laboratories, whereas SME suffer from lack of scale and indivisibilities in this respect. Probably the main reason why things are as they are is that company laboratories are a kind of half-way house between private business organizations and research institutions, and find it therefore quite easy to communicate with the latter, whereas SME have to cope with all the structural obstacles to interaction between business and research, which stem from secrecy vs. publication interests and short- vs. long-term orientation. On the other hand, if research institutions operate in a business-like way, the structural obstacles may vanish, only to be substituted by a new obstacle, namely the relatively high cost of their services. Even though policy-makers are aware of the problem, their efforts to involve SME more in R&D programs had only a limited effect (Figure 7). There are, nevertheless, ongoing efforts at all levels, i.e. by *Länder* and federal governments as well as the EU, to adjust policy instruments in order to foster collaboration between SME and research institutions.

Figure 5

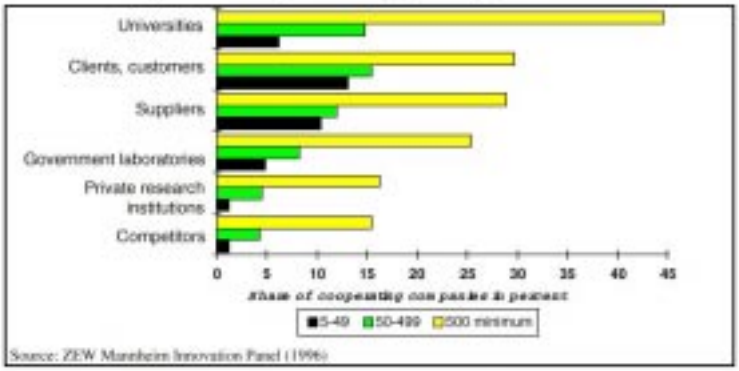
The importance of sources of information



Source: ZEW Mannheim Innovation Panel (1996)

Figure 6

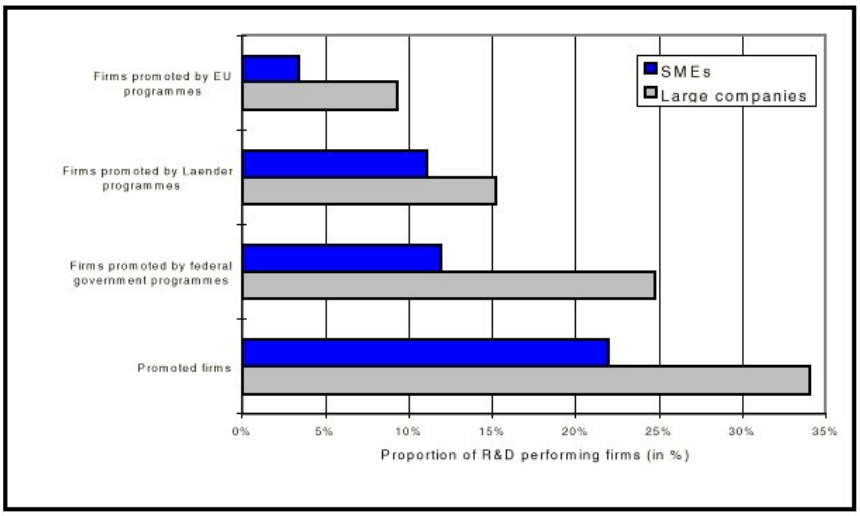
Proportion of companies with cooperation projects



Source: ZEW Mannheim Innovation Panel (1996)

Figure 7

Participation in promotion programmes during the years 1992 - 1994 by firm size



Source: ZEW (1996): Mannheim Innovation Panel

4.2.5. The Steinbeis Foundation

One of the remarkable success stories in terms of SME-related innovation networking is the Steinbeis Foundation in Baden-Württemberg. Its foundation dates back to the 1960s and 1970s. During this time universities of applied science (*Fachhochschulen, FHS*) were established. This gave rise to another idea: to set up a central service agency to supply know-how to SME, linking them with FHS. To fulfill this purpose, the Steinbeis Foundation for Economic Promotion was established in 1971. It started as a private-law foundation with five so-called Technical Consulting Services. These centers, headed by professors from FHS in the region, worked as general points of contact for technology-oriented questions and problems, particularly from small and medium-sized companies. Because of its successful work, the Foundation became a member of the Government Commission for Technology Transfer at the beginning of the 1980s. Based on government support, the Foundation added to the existing facilities a network of around 270 Steinbeis Transfer Centers. As a rule, each of these Centers is specialized in a specific topical focus in accordance with the needs of the regional economy.

The Steinbeis Foundation works as an intermediary institution for technology transfer between the government and universities / FHS on the one side and industry on the other. It receives little institutional grants and finances itself to the tune of 96 %. Even though the Foundation does not depend financially on the government, close cooperation is advisable as the institution is often perceived as an operational unit of the state anyway, namely because the chairman of the board of the Foundation is at the same the Government Commissioner for Technology Transfer in Baden-Württemberg.

The Foundation calls itself a service enterprise since the centers are organized as profit centers, which finance themselves through projects with SME. The Foundation has no R&D infrastructure of its own. It rather operates as a matchmaker between enterprises seeking technological support and universities and FHS. Projects are often short-term, addressing immediate problems of enterprises, and in many cases the fees amount to no more than $ 3,000 - 5,000.

To secure efficient technology transfer the centers are dispersed all over the state. The internal organizational structure somewhat resembles a franchise system, with a network structure between centers as an additional element to mobilize know-how. Steinbeis centers offer consulting, applied R&D, further education and expertise regarding all sorts of enterprises issues. More precisely, in terms of consulting they offer project-, information-, cooperation- and quality-management (as well as certification), strategies to optimize business organization, market analysis and diversification. In applied R&D they support product and prototype development and optimization. They also advise local and regional public actors within technology and incubator centers or economic promotion agencies.

4.2.6. The Center of Innovation and Technology in North Rhine-Westphalia (ZENIT)

Another example of an institution that promotes innovation in SME is the Center of Innovation and Technology in North Rhine-Westphalia, ZENIT. It is a technology-oriented consultancy company which was founded in 1984, largely on private initiative. It is owned by the Ministry of Economics of the Land of North Rhine-Westphalia, a bank-

ing consortium which comprises the State Bank of North Rhine-Westphalia as well as private banks, and a private association which unites about 170 companies. It has about 50 employees and the annual turnover amounts to about DM 10 million. Its mission is to facilitate support for SME, especially in technical and technological areas.

Apart from technology transfer, ZENIT is also engaged in the fields of marketing and management consultancy. Here the focus is on market research, consultancy services in marketing, quality management issues and employee training as well as opportunities to obtain public funding. The center offers strategy advice regarding entry into other European markets, like identification of potential cooperation partners in other EU countries, information on EU legislation, and information regarding environmental and communication technologies (like Eco-Audit for SME or Internet representations and cooperation exchanges).

At the same time ZENIT is one of more than 30 Euro-Info-Centers (EIC) in Germany, which inform, coordinate and encourage SME to get access to EU support programs.[15] ZENIT develops its own technology and restructuring projects with its members as part of main support actions of the EU Framework Programs for R&D. Within the main action "Sustainable Management and Quality of Water" of the Fifth Framework Program (1999 to 2002), for instance, ZENIT encourages projects like the mentioned Eco-Audit Model Manual for SME, integrated approaches for the management of water resources or technologies for the monitoring and prevention of pollution, etc.

15 Other EIC are integrated in chambers, state or house banks. The European funding programs in the areas of innovative products, processes and organization for SME are integrated in the Fifth Framework Program for research, technological development and demonstration activities (1998-1992), www.cordis.lu, or www.zenit.de.

4.3 Technology centers and incubators (TGZ)

The numerous discussions about securing Germany as a location for industry often emphasized that founding technology-based firms can make an especially important contribution to securing the international competitiveness of the economy. Since the early 1980s, an increasing number of support programs has been directed towards these enterprises. This was triggered by observations made in the USA, particularly in Massachusetts and in Silicon Valley. Other contributing factors were the discussion, arising at about the same time, on Europe's tendency to fall behind in the international technology race.

Technology centers and incubators (TGZ) today are one of the most popular instruments of economic and technology support at the local level (Kulicke 1997, Sternberg et al. 1996). There has been a real "boom" in the creation of such centers. The first TGZ was founded in 1983, by 1999 there were more than 200 all over Germany, and some *Länder* were just about to set them up.

The basic concept of a TGZ is to create favorable framework conditions for start-ups, especially innovative and technology-oriented firms, including the stimulation of contacts between new enterprises and research institutes, technology transfer institutions, banks, insurance companies and consulting opportunities. The long-term goal is to improve the regional innovation potential from the bottom up, with synergy effects like the creation of qualified jobs and the attraction of other innovative enterprises (FES 1993: 7).

The foundation of the centers can be seen as a recognition of the disadvantages which young research-intensive firms are facing in the German economy. Although there exists a potential for innovation, there is a lack of finance and knowledge of start-ups and of the transformation of a promising idea into a successful product. The centers offer space at a lower than the going rate. They also offer common facilities and technical services like conference rooms, photocopying machines, secretary offices, telephone offices or laboratories, and telecommunication services. The manager of the center offers contact and cooperation arrangements with banks, external consulting firms for product and marketing innovation, market analysis, investment planning or support in personnel and technology transfer with universities or other research institutes.

Regarding the financial and organizational structure of TGZs, it is important to distinguish between the construction and operating costs. There are further differences between the TGZs in East and West Germany. While in West Germany one third of the construction costs was financed by *Länder*, cities, banks and other private organizations (especially the chambers), in the East more than 50 % are financed by the federal government due to the financial problems of the new *Länder* and their cities after the reunification (Sternberg et al. 1996: 64). Private institutions and banks hardly contributed to the construction costs in the East.

The TGZs are usually organized as limited liability companies (GmbH). They are jointly owned by different institutions like local government, chambers, banks, universities and research institutes as well as local and regional economic promotion agencies; in the mid-1990s, only 11 % of the TGZs were exclusively government-owned (Sternberg et al. 1996, p. 52). The construction of TGZs is usually funded by the government, especially through regional developments programs.

4.4 Industrial engineering organizations: RKW and REFA

The Board for Rationalization of the German Economy (RKW) was founded in 1921 and is supported by the *Länder* and the federal government. Its task is to support the increase in productivity and employment in SME. RKW offers information mediation, consultancy and diagnostic measures for best practice in organization and outsourcing.

To combine employment creation and productivity increases, a guiding principle of RKW is to increase the awareness regarding the importance of continuous learning for employees and employers. RKW organizes a variety of training courses inside and outside firms, conferences, fairs, events for business cooperation, and Internet forums on specific issues. The members of the RKW also founded an innovation center in Berlin as a discussion platform for scientific, social, political end economic actors regarding new concepts in the field of productivity and employment. The aim is to encourage a network of multipliers in the development of support policies which combine employment and productivity approaches.

REFA (Institute of Work Study Practitioners) was founded in 1924. It is a private association with about 40,000 members, among them 1,600 firms. Many of its activities are run by volunteers in the 150 chapters which exist all over the country. Initially, its focus was on scientific management, following Taylorist principles. REFA has established itself as a major provider of training activities in this field, and a REFA certificate used to be a valuable asset for engineers and technicians in

search of attractive, well-paying jobs. More recently REFA has broadened its focus, addressing industrial engineering issues in a more comprehensive way.

RKW and REFA offer skills which are highly relevant for firms. Large companies can set up in-house training facilities and are therefore less dependent on external providers of training courses. Accordingly, RKW and REFA are particularly relevant for SME.

4.5 Banks with special focus on SME

Germany has a large number of financial institutions. Large banks, such as Deutsche Bank or Dresdner Bank, mainly cater to large enterprises. But there are other institutes which support the *Mittelstand.* They act at different levels, according to their historical background. At the local and regional levels there are public savings banks ("*Sparkassen*") and credit cooperatives ("Volksbanken und Raiffeisenkassen"), at the *Länder level* there are collateral guarantee banks, and at the national level there are the Bank for Reconstruction (*Kreditanstalt für Wiederaufbau,* KfW) and the *Deutsche Ausgleichsbank* (DtA).

- Publicly organized savings and cooperative banks are the main financing agents for SME due to their historical background and their decentralized structure. At the same time they work as intermediary institutions between the enterprises and the guarantee banks as well as the KfW and the DtA.[16] They get support from the guarantee banks, which are backing credits which the company's bank otherwise would not accept because of the customer's insufficient collateral. In the case of SME programs from KfW and DtA, the company's bank transfers the information and is responsible for the winding-up of applications. Due to the regional principle (especially of the *Sparkassen*) they invest in other meso-level institutions, such as technology centers.
- Credit guarantee banks evolved as a joint private and public risk-partnership. These banks are present in all the German *Länder*.
- The KfW and the DtA are large government-owned banks with the task of supporting specific areas of economic development. Through various programs in support of SME, they play an important intermediary role between the entrepreneurs and commercial banks on the one hand and the national *Mittelstand* policies on the other.

4.5.1. Public savings banks and credit cooperatives

There are 600 public savings banks (*Sparkassen*) with 19,100 branches throughout Germany. They are public-law institutes of the city or the county in which they are located, i.e. government representatives play a key role in governing these institutions, and the government has to bail out *Sparkassen* which run into financial difficulties.[17] They emerged in

16 In fact, the share of the large banks, such as Deutsche and Dresdner, in intermediating KfW credits for SME decreased from 32 % (1991) to 15 % (1998) whereas the share of Sparkassen increased from 20 to 37 % and that of credit cooperatives from 10 to 24 %. Further mergers like the one between the Dresdner and Deutsche Bank will encourage this trend in the future.

17 Because the Sparkassen do not receive equity from the cities or the counties, they have to fi-

the second half of the 19th century at the regional level to give the lower classes of society an opportunity to save money in interest-bearing accounts as well as to improve the savings ratio and the supply of credit at the regional and local levels. Until today they have had the duty to offer a savings account to everyone who wants one.

At the beginning of the 20th century they evolved into commercial banks, although their main business focus is still the collection of the population's savings (two thirds of the balance sheet). These savings finance long-term investments, for example in the real estate sector and the local and regional communities. The activities and investments of the *Sparkassen* are – due to their regional principle – concentrated in their local areas. *Sparkassen* participate in the construction and operation of other institutions or agencies such as technology centers or regional and local economic support agencies and offices.

The *Sparkassen* are, together with the *Volksbanken*, the main source of credit for SME. However, their behavior differs substantially from county to county, especially in terms of risk-aversion. They are the main source of credit both for long-established SME and for start-ups. But a common criticism is that they have a strong preference for financing firms which have a long track-record, whereas they tend to rate fast-growing new firms as too risky. A lending policy which is sometimes perceived as highly conservative is the outcome of a governance pattern according to which government representatives by all means try to avert financial problems, since a bail-out would put an additional burden on already strained public finances.

Apart from the normal business of financing investment and working capital, *Sparkassen* are the main intermediaries for national and *Länder* level financing programs targeted towards SME. They implement financing and guarantee programs for SME which are offered by the KfW and the DtA as well as the credit guarantee banks (which are mostly operating at the *Länder* level).

An important element of the *Sparkassen* system are Land level banks (*Landesbank-Girozentrale*), which evolved from a mere intermediary for money transfers to full-fledged commercial banks which, among other things, are involved in the global banking industry. Since they are government-backed institutions, they enjoy strong credit ratings and other advantages, something that private commercial banks perceive as an unfair advantage. The Commission of the EU started to investigate this system in the late 1990s and is expected to enforce certain changes to create a level playing-field.

The credit cooperatives (*Volksbanken* and *Raiffeisenkassen*[18]) are involved in the same tasks as the *Sparkassen*, and they have additional responsibilities due to their organization form as credit cooperatives. They emerged at the end of the 19th century as private self-help-institutions of craftsmen, small entrepreneurs and peasants, who had difficulties in getting credits from the established banking system. Since 1974 these banks have also been open to non-members. They do not have a government-backing.

nance themselves through savings and the retention of the profits.

18 In the past the Raiffeisenbank concentrated on agricultural sectors in the countryside, and the Volksbanken on manufactured sectors in the cities. In 1972 these two banks merged.

In 1998 there were 2,248 cooperative banks with 18,471 branches all over Germany. Although they have a high share in the overall number of credit institutes, the share of the cooperatives amounts to only around 25 % of the total balance sheets in comparison to the share of the *Sparkassen* (around 50 %)coop. But due to several mergers, their decentralized organization and close contact to their members the cooperatives were able to grow and to keep their competitiveness.

Apart from the organization form and the historical background, the task of the cooperatives does not differ to a large extent from the one of the *Sparkassen*. Although the cooperatives are not bound to the locality principle, their investments are in fact oriented towards the respective geographical area.

4.5.2. Credit guarantee banks

Collateral guarantee institutions (*Bürgschaftsbanken*) began operating in the 1950s. It was an initiative of chambers, savings as well as cooperative banks, and the Federal Ministry of Economics to implement state-supported financial help for small-and medium-sized companies. This joint initiative of public and private actors emerged from the observation of a lack of credit due to market failures. After a rather hesitant beginning, these organizations developed remarkably. Little by little, collateral guarantee organizations came into existence for all branches of business (wholesale and retail trade, industry, hotels and restaurants, horticulture, self-employed, etc.). Today, there are credit guarantee organizations for almost all branches of business in all *Länder*. Meanwhile the name "collateral guarantee organizations" has changed to "guarantee banks" or "*Bürgschaftsbanken*".

The 23 *Bürgschaftsbanken* provide banks with guarantees for loans, lease-financing contracts and investments in small and medium-sized firms, so that the latter are able to hand out higher credits. The rationale is to facilitate enterprise financing, thus overcoming the limits of firms' own collateral. They support enterprises in the seed- and start-up phase as well as projects of existing companies. In addition to traditional credit and loan financing – including those from government-supported programs – *Bürgschaftsbanken* are also addressed as "risk partners" in leasing contracts and providers of equity capital. The scope ranges from capital investments for the founding of new enterprises and company expansion, moving the business to a new location, rationalization and measures for adapting to changing markets on the one hand, and the whole sphere concerned with working capital, such as the financing of merchandise, of receivables, as well as guaranteeing of bonds for down-payments, warranties etc. on the other hand.

Founders and shareholders of *Bürgschaftsbanken* are the chambers of commerce, the guilds of the different trades, associations of various business sectors as well as banks and some insurance companies. They provide the founding capital, payments into reserve funds, advice and expertise in the decision-marking process. No dividends are paid, as surplus funds are retained and allocated to reserves. *Bürgschaftsbanken* operate under the regulations of the German banking law. They are supervised by the federal supervisory agency (*Bundesaufsichtsamt für das Kreditwesen*) in much the same way as all other banks in Germany.

In addition to the support from the founders and shareholders, the government helps the *Bürgschaftsbanken* in three important areas: 1) As non-profit organizations they do not have to pay corporate income tax, 2) the guarantees of the *Bürgschaftsbanken* are counter-

guaranteed by the federal and *Land* government (which back a maximum share of 39 % and 26 %, respectively, of the amount of the guarantee; in the "new *Länder*" this amounts to 48 % from the federal and 32 % from the *Land* government), 3) long term loans are financed by the federal government, taken from the so called ERP fund[19] at low interest rates.[20]

To get a guarantee of a *Bürgschaftsbank* a company submits an application form together with a statement from its bank asserting their readiness to take over the share of the risk the guarantee does not cover. The share of the *Bürgschaftsbank* in the credit risk varies between 50 % and 80 %. The average term of the guarantee is about 10 years. The upper limit extends to DM 1.5 million (exceptions are possible). A flat fee and an annual commission are charged.

The ultimate criterion for the approval of a guarantee-application is the financial viability of the project. The credit-officers collect and evaluate information such as balance sheets, business-plans, cash-flow projections, comments of the chamber of commerce or the guild, the respective business association as well as general data of the specific business sectors, for example the structure of competition. In the case of applications of persons planning to become self-employed, the professional qualification as well as the knowledge of business and financial affairs are carefully reviewed. A detailed report, prepared by the credit officer, will be discussed in a committee consisting of representatives from trade and industry, the banks and representatives from the Ministries for Economics and Finance. The ultimate decision lies with the management of the *Bürgschaftsbanken* although the concurrence of the committee is necessary.

4.5.3. The Kreditanstalt für Wiederaufbau (KfW) and the Deutsche Ausgleichsbank (DtA)

The *Kreditanstalt für Wiederaufbau* (KfW) was established in 1948 by law as a public corporation for special functions. KfW is the German economic development bank. Its main business takes place inside Germany. However, it is also the executing agency for financial assistance to developing countries. 80 % of its capital of DM 1 billion is held by the federal government, 20 % by the *Länder*. With a balance sheet total of around DM 250 billion it counts among the biggest banks in Germany. In the first years after World War II, KfW financed the reconstruction of Germany with long-term credits. Later it focused more and more on the support of structural adjustment within the German economy. Today its task is in investment finance, export and project finance, financial cooperation and advisory as well as other services. KfW can be seen, together with the Deutsche Ausgleichsbank, as one of the most important institutions of the national *Mittelstand* policy, since they administrate the government's financial support programs for SME and large enterprises. KfW is engaged in programs for investments, environmental technology and foreign investments, venture capital and infrastructure.

The *Deutsche Ausgleichsbank* (DtA) is a wholly-owned development agency of the German federal government. The agency,

19 A substantial part of the funds which Germany received from the European Recovery Program, i.e. the Marshall-Fund, after World-War II, was handed over as a credit rather than a grant. The repayments of those funds created the ERP fund, which is a revolving fund used for specific purposes such as SME support. KfW and DtA administrate the ERP fund.

20 Cf. www.buergschaftsbank.de/outline.htm.

which was established in 1950, was initially set up to help compensate for the financial burdens and to aid the integration of expelled persons and refugees into West Germany after World War II. Over time its function changed to a special purpose agency which provides subsidized loans, equity financing and guarantees on behalf of the federal government in order to promote SME. This now constitutes the Bank's main area of business. Due to the programs of the national *Mittelstand* policies the DtA does not only support business start-ups. It also supports environmental protection projects, educational and social programs as well as mobilizing venture capital for young high-tech and low-tech companies through its wholly-owned subsidiaries, the *Technologie-Beteiligungs-Gesellschaft* and *Beteiligungs-Gesellschaft*. DtA, like the KfW, funds SME in Germany from two sources – from Germany's European Recovery Program (ERP) fund and its own funds which it raises on the domestic and international markets. DtA is the main lending bank for loans from the ERP fund.[21]

4.6 Chambers of industry and commerce and of crafts

Germany has 82 regional chambers of industry and commerce and 55 chambers of crafts. They cover the entire territory of Germany. They are public-law institutions administrated by the private sector. Membership is compulsory. Due to their long tradition (since the second half of the last century) and early political incorporation in German history they are in charge of many public supervision tasks, especially in terms of registering companies, certifying vocational training and taking exams. They issue certificates of origin.

Moreover, they offer their members a range of courses in ongoing education (management, production, investment-, business and financial planning), information and advice in export, start-up, technology transfer and legal issues.[22] They organize events to stimulate enterprise cooperation and joint ventures, start-ups, and technology updating within the region and worldwide, and they are responsible for giving advice on guarantees (*Bürgschaften*) to the corresponding banks at the regional and federal levels. They also advise the local and regional government on questions which concern their members and the local, regional, and federal economy. They are also well informed of existing support instruments for SME and large enterprises.

Chambers sometimes take a share in technology centers and incubators or local and regional economic support agencies. Cooperation with other institutions like training and advisory organizations leads to the construction of "Houses of Crafts" or "Economic Support Centers" in many larger cities.

Regarding chambers of crafts, it is important to note that even though their history goes back to the medieval guilds, they exist despite, not because of this tradition. In fact, they were bound for abolition in the 19th century since they appeared as an obstacle to industrial dynamism. It was only after protracted lobbying and negotiation processes that their existence was confirmed, and this was pretty much due to a functional argument, especially in terms of guaranteeing a consistent quality of vocational training.

21 Cf. www.dta.de.

22 The chambers of commerce and trade have got 110 offices in 70 nations throughout the world to encourage foreign economy relations. Look at Internet: www.ahk.de

4.7 Economic promotion agencies at the local, regional and Länder levels

In the past, economic support at the *Land* level was organized by the Ministries of Economics. At the local level, local administration is responsible for economic promotion, which traditionally meant, first and foremost, provision of real estate. The last decade has seen both the amplification of local activities and the creation of regional economic promotion agencies at the level in-between, founded by the different local authorities, private institutions and enterprises in the region. With the change of framework conditions the organizational forms of these institutions also changed. Reforms were necessary within the different units. They contributed to new organizational forms and responsibilities.

In the 1980s local economic promotion was organized as a department within local administration. Subsequently, local governments have tried to adapt their organization and working methods to the changing circumstances. To be more flexible and transparent, a great deal of responsibilities of state Ministries of Economics was transferred to economic support agencies. The same occurred at the local level. Here, the model of public-private partnership (PPP) gained importance. The advantage of this form of organization is a less bureaucratic and more efficient style with synergy effects due to the closer cooperation with the private sector.

There are different forms of PPP. Often organized as a limited liability company (GmbH), the public sector generally holds a majority, with the chambers or the private sector (banks, employers' associations, estate and assurance companies, private enterprises) holding minority shares. At the same time, the focus of most of the local promotion agencies extended from the provision of real estate and enterprise zones towards marketing of the location, SME and entrepreneurship support, business networking initiatives, and further activities.

Economic promotion agencies at the *Land* level, which sometimes take the form of PPPs, coordinate the support at the different levels. In the past they encouraged the renovation and redevelopment of cities and old industrial infrastructure. Today they also encourage the construction of European and international cooperation networks of SME. They also organize information dissemination towards the lower levels regarding support programs from the *Land* and the European Union. Other activities include locational marketing to attract investors and export promotion.

The aim of regional support agencies is regional location consultancy and marketing. These institutions develop regional development concepts, and they start to explore the possibilities of the creation, fostering and management of clusters. They often also organize meetings of SME in the region and cooperation projects with large enterprises.

5 Sources of support for the *Mittelstand* at the European, national and regional levels

5.1 The role of the state in SME support policies

In the course of the last forty years, different SME support policies were introduced in Germany to alleviate the weaknesses and the market failures which impede the access of SME to credit, venture capital and R&D, as

well as deficiencies regarding information and consulting, cooperation, export orientation and start-ups. Whereas the last chapter focused on the description of several public and private institutions and public-private partnerships, we will now look at the evolution of European, national, regional, and local support policies as well as the specific instruments.

The ascendance of support policies, programs and instruments reflects an increasing consideration of SME development in German economic policy. At the end of the last century, the government of the Reich as well as small entrepreneurs created some fundamentals for the later success of SME, like measures for supporting handicraft as well as the introduction of the dual training system. Nevertheless, during this period industrial policy focused at large enterprises and heavy industries. It was only in the -period after World War II, and especially in the 1960s, that SME support policies received rising consideration. Ever since SME support policies have evolved step by step, with the importance of SME and also the number of support programs increasing in parallel to the process of structural change (read: the decline of traditional industrial sectors and the massive loss of jobs).

In the 1950s and 1960s SME support was justified by their important role regarding the vitalization of competition in the economy, as well as their suffering from certain market failures. In the 1970s and 1980s, more emphasis was given to the potential contribution of SME to employment creation and innovation. During these two decades rationalization and relocation processes of large enterprises, including relocation of traditional industries to low-wage countries, started to have a notable impact on unemployment. At the same time, SME in countries like USA and Japan demonstrated their innovative potential in the world market. SME support measures were amplified and diversified in order to sustain the international competitiveness of the German economy. For instance, it is not by chance that technology incubators became popular as a tool to encourage technology-based start-ups. In the 1980s and 1990s, many hopes were pinned on the creation of innovative small firms and their contribution to the creation of well-paid, secure jobs. Creating new jobs, and actually jobs at different qualification levels, became an ever more pressing necessity since traditional industries like coal and steel continued to decline, relocation of industry to low-wage countries went on, and competitive pressure kept rising, not the least due to a demand which was increasingly differentiated and price-conscious, while at the same time expecting high quality.

5.2 SME support in regional and structural policies at the European Union and the federal/land levels

5.2.1. EU regional and SME policy

The main objective of the EU Commission's initiatives is the deepening of the European integration process in economic, political and social terms. Based on the principle of subsidiarity, the European Union supports, first, backward regions and regions which suffer from structural crises, mainly due to the decline of traditional industries, and, second, branches and certain disadvantaged groups within each member state, independent of their location. Regarding SME support, EU policies can be distinguished along these lines. The first line of action includes regional policy measures, which often give an indirect support to SME. The second line includes direct support policies for SME, especially in

terms of technological upgrading. In both cases the EU provides the financial resources and defines the framework conditions. The policies are carried out in the context of special support programs, which are formulated together with the member states, the regional and local governments and non-government economic and social actors. The member states have to define a development plan, which has to be presented to the Commission for examination and approval. The programs contained in the development plan have to define the goals, criteria, and target groups of implementation activities pursued by public and private actors at a decentralized level.

For the implementation of regional policy the European Commission has established structural funds for different support areas. Regarding SME support, the most important funds are the European Fund for Regional Development (EFRE) and the European Social Fund (ESF). EFRE addresses regions with severe economic and social problems. Until recently, the Commission defined six types of regions to be supported, according to different types of structural problems. From the year 2000 onwards it will distinguish only between three types of regions, after having restructured the rules of regional policy, trying to focus at the most backward regions.[23] In West Germany, especially old industrial regions have been supported ("target 2"). Since reunification the entire former GDR has also received support since per-capita GDP was substantially lower than the EU average ("target 1").[24] EFRE focuses on the creation and preservation of employment, the restructuring and development of old and new industrial areas as well as on other projects for regional development; SME support comes in to the extent that it contributes to these goals.[25] The ESF addresses areas like training, qualification, further education, support of personnel in science and technology as well as interaction between training institutions and the economic sector.

More direct support policies for SME, independent of region and location, have gained importance in the last decade. Various programs and institutions have been established to stimulate and support SME and other economic and social actors. Particularly important are the EU Framework Program for the Support of Science and Technology (FTE), the European Investment Bank (EIB) and the European Investment Fund (EIF).[26] These institutions spend part of their resources to provide risk capital and to support start-ups of innovative firms, R&D, qualification and further education, international cooperation between firms, loans, venture capital funds, and credit guarantees.[27]

23 Until recently the EU distinguished between regions which are backward in their development stage (target 1), are confronted with declining industrial development (2), experience high unemployment (3), experience a structural adjustment process in the agricultural and fishing sector as well as in the rural areas (4, 5, 6).

24 From 1994 to 1999 the new federal states received 13.64 billion euro through the EU funds, the old industrial areas in the west 733 million euro. For measures against unemployment Germany received 1.94 billion euro until 1999 (Geilen & Vielhaber 1999: 7).

25 For information about the EFRE and ESF see www.inforegio.org.

26 A minimum of 10 % of all financial resources from the FTE has to be spend on SME. In the years from 1999 to 2002 these are 1.5 billion euro (Geilen & Vielhaber 1999: 12).

27 Regarding the support for SME in the EU see www.cordis.lu .

5.2.2. Regional and SME policy at the national and regional levels

SME support at the national and regional levels distinguishes between regional policy and the *Mittelstand* and technology policies at the national and *Länder* levels.

Regional policy is defined in the German Constitution as a joint task of the federal government and the *Länder,* and its strategy and instrument are defined in the framework of the so-called Joint Task to Improve the Regional Economic Structure (*Gemeinschaftsaufgabe,* GA). GA was formulated in 1969 and its main objective is the reduction of disparities between German regions. Federal and *Länder* governments each contribute 50 % of the funding, whereas it is the task of the *Länder* and the municipal governments to actually implement the policy.[28]

Like the regional policy of the EU, the German regional policy addresses regions with severe economic and social problems. GA distinguishes three types of backward regions:

- A: the weakest East German regions;
- B: the other East German regions;
- C: backward areas and areas suffering from structural problems in West Germany.

GA uses as main instruments grants for firms which will invest in modernization or in the expansion of their productive capacity, thus securing jobs or creating new employment. SME receive preferential treatment. The maximum grant element differs according to the type of region where the respective facility is located: 50 % in the case of SME and 35 % for large firms in A regions, 43 % / 28 % in B regions and 28 % / 18 % in C regions (Deutscher Bundestag 1999: 13). GA funds may also be used to subsidize consultancy, to finance training and research activities of enterprises and for credit guarantees.

Apart from GA, there are specific programs addressing SME. Some of them are labeled Joint Initiatives (*Gemeinschaftsinitiativen*) between the EU and the federal government. One of them is the 'Initiative for the adaptation of SME in the European market', which supports the introduction of systems of quality and environmental management (Eco-Audit). It offers subsidies with a maximum share of 80 % of total cost and a maximum amount of DM 60,000.

Other special *Mittelstand* policies are carried out at the different levels. An explicit *Mittelstand* policy at the federal level was introduced in 1970 in order to create adequate framework conditions for SME and to alleviate market failures. In 1996 the federal budget for *Mittelstand* policies amounted to DM 3.5 billion.[29] On top of that there are financial resources from the ERP fund (1995: DM 13.6 billion), which is administrated by the Federal Ministry of Economics and passed on via the *Kreditanstalt für Wiederaufbau* (KfW) and the *Deutsche Ausgleichbank* (DtA).

28 In the 1999 budget the federal government and the Länder each spent 235 million DM on the GA (Deutscher Bundestag 1999: 15).

29 This sum does not include the institutional support for chambers, associations and other institutions mentioned before.

Table 7: Start-up programs

Support program	Territory [1]	Area	Size of Enterprise	Sector
ERP equity support (EKH)	ALL	Increase founder's equity	SME	Handicraft, trade, manufacturing industry, tourism, transport industry, free-lance sector
ERP start-up	ALL	Investments in the start-up phase	SME	Handicraft, trade, manufacturing industry, tourism, transport industry, free-lance sector
DtA start-up	ALL	Investments, qualification, consultancy, equipment	SME	Handicraft, trade, manufacturing industry, tourism, transport industry, free-lance sector
DtA Startgeld	ALL	Investments in the start-up phase	SME	Handicraft, trade, manufacturing industry, tourism, transport industry, free-lance sector

[1]NFS= New *Länder*, OFS= Old *Länder*, ALL=the whole of Germany (BMWi 1999)

The *Mittelstand* policies of the *Länder* emerged in the middle of the 1970s as a response to accelerating structural change. Today, there are more than 100 support programs and instruments as well as more than 1,000 economic support organizations, which are public, private or PPP. There are two points of view which both, to a certain extent, justify this diversity. The first is to emphasize the high degree of decentralization, which allows institutions to tailor their activities to the local profile and the specific local problems and opportunities. Also, both collaboration and competition exist, thus creating synergies and at the same time a healthy rivalry which encourages creativity. The other point is to criticize overlaps and lack of coordination, lack of transparency and substantial transaction and opportunity costs. Moreover, the monitoring and evaluating systems are very deficient. The only major evaluation of the support system was commissioned by the federal government in 1997.

5.3 Specific support programs and instruments

5.3.1. The support of start-ups

Apart from technology and incubator centers as well as information centers at the local level there are several programs at the national and *Länder* levels to facilitate the financing of new enterprises, namely the ERP equity support program (EKH), the ERP start-up program, the DtA start-up program and the DtA *Startgeld*. These programs are accessible to new entrepreneurs all over Germany. They are designed to support the start-up phase of a new enterprise, to finance investments in materials, machines, premises, etc., and to improve the equity base. It is possible to combine support from different programs.

The EKH (equity program) is particularly relevant for entrepreneurs with little savings and guarantees. To get loans from the EKH the founder does not need collateral. Provided that his personal equity amounts to at least 15 % of the necessary capital, he can receive further 25 % of the necessary capital through

Table 8: **Investment support programs**

Support program	*Territory 1*	*Area*	*Size of enterprise*	*Sector*
Special investment support program	NFS	Investments	All	Small and medium-sized enterprises of all sectors
Special depreciation	ALL	Tax relief for investments in machines and buildings	SME	Small and medium-sized enterprises of all sectors
ERP regional program	OFS	Investment support within the regions of the G*emeinschaftsaufgabe*	SME	Handicraft, trade, manufacturing industry, tourism, transport industry, free-lance sector
ERP construction program	NFS	Construction investments	SME	"
KfW *Mittelstand* program	ALL	Construction and equipment investments	ALL	"

[1]NFS= New *Länder*, OFS= Old *Länder*, ALL=the whole of Germany (BMWi 1999)

Table 9: Research cooperation, technology innovation and transfer programs

Support-program	*Territory 1*	*Area*	*Size of enterprise*	*Sector*
R&D and innovation	NFS	Personnel and project support in research	SME	Handicraft, trade, manufacturing industry, tourism, transport industry, free-lance sector
R&D alliances	ALL	Cooperative research between SME	SME	Handicraft, trade, manufacturing industry, tourism, transport industry, free-lance sector
PRO INNO	ALL	Joint R&D projects between SME and institutes	SME	Handicraft, trade, manufacturing industry, tourism, transport industry, free-lance sector
Patent action	ALL	Support to research and application for a patent	SME	Handicraft, trade, manufacturing industry, tourism, transport industry, free-lance sector

[1]NFS= New *Länder*, OFS= Old *Länder*, ALL=the whole of Germany (BMWi 1999)

EKH. The DtA and ERP start-up programs together make it possible to cover 75 % of the expenses of a start-up with loans (in the new *Länder* even more). But there are still possibilities to bridge the financial gap (in this case of 10 %). One possibility is a commercial bank offering a credit at market conditions. Another option is the DtA start-up program, which can give additional loans if a start-up creates jobs (DM 50,000 for each job).

The DtA Startgeld program is another option. It addresses founders with no equity at all. Lack of collateral is no obstacle, either, for a loan up to DM 100,000. This gives financially weak founders (like young persons or unemployed) a chance of access to long-term loans. There is another support program for the support of technology-oriented start-ups (FUTOUR). The subsidy may cover up to 70 % of overall investment.

Apart from the national programs, the *Länder* have created additional programs. We will take the activities in North-Rhine Westphalia (NRW) as an example of such initiatives. Two programs in NRW are particularly interesting. First, there is the " Impulses for the Economy Program." One element of the program is the support of start-ups. It is designed as a joint activity of the investment bank NRW (a *Land*

level, government-owned development bank) and the DtA. They support the financing of investments and means of production for founders. It is comparable to the DtA start-up program. But there are important differences. While the DtA start-up program supports only founders before they start their business, the joint program may support new firms until the eighth year of their existence. Moreover, it offers loans of up to 100 % for additional costs of means of production, and there are loans with lower interest rates for special target groups.

Second, there is the "GO! initiative" (*Gründungsoffensive*), which was launched in 1995 as a joint initiative of the *Land* government, chambers, economic support agencies, credit institutes, employers' and employees' associations, technology centers and universities at the local and regional levels. Private and public actors support start-ups in a network pattern, each organization within its specific area of competence, with some organizations acting as network managers, advising potential entrepreneurs on where they can obtain what kind of information and support. Overall, there are 30 regional and local start-up networks to provide information and advice free of charge. The economic promotion agency of NRW established a toll-free phone number where potential entrepreneurs receive information on network members in their respective region. As it involved an intensive marketing strategy, the term 'GO Initiative' is today a synonym for start-up in NRW.

The main objective, not only of the GO Initiative, is to change the traditional mentality and encourage a new culture of entrepreneurship. Awareness-building and specific training activities in universities are additional instruments. The number of start-up information events increased from 27 in the first half of 1996 to 130 in the second half of 1998. Business-plan contests are organized, and the *Land* government supports junior researchers who are prepared to set up their own firms inside university.

5.3.2. Investment support

Investment grants are the main instrument of the Joint Task (Gemeinschaftsaufgabe). Moreover, there are the ERP regional and KfW *Mittelstand* programs, and there are also indirect support measures for investments like tax relief. Marginal tax rates on profits in Germany are comparatively high (up to 53 %) and large firms have much more latitude to use loopholes within that system than SME. Support measures are supposed to compensate for these distortions.

Credit guarantees are another important instrument to support productive investments. As we have explained above, specialized guarantee banks offer them to all sorts of firms, although they are particularly relevant to small businesses.

5.3.3. Research cooperation, technology innovation and transfer

There are several programs at the national and *Länder* levels to support research and technology transfer inside and among SME and between SME and research institutes. Some of the programs are supported by subsidies, special credit lines and by venture capital programs.

At the national level there are especially four subsidy programs worth mentioning. These are

- Support for research, development and innovation in SME and external re-

search institutes, restricted to the new *Länder* in the East. This program focuses on personnel and project support. The personnel support is based on subsidies of 40 % for research personnel working in SME to improve product and process innovation. SME obtain a grant of up to 45 % of the project total for the development of new concepts and products.

- Support of Joint Industrial Research, a program which subsidizes research projects focused on cooperation between SME of one branch or technological area.
- Program for Innovation Competence in *Mittelstand* enterprises (PRO INNO), subsidizing joint R&D projects of SME and research institutes.
- SME patent action, supporting SME with little experience in patent applications.

Apart from subsidies there is the option of receiving long-term credits at favorable interest rates from the ERP innovation program. It applies to all activities generating product and process innovation. In the R&D phase it may be used to finance personnel, inputs and other investment. At the launch of the product consultancy, market research and further qualification of personnel may be financed through this program.

At the *Länder* level there are several technology and research cooperation programs. For instance, NRW has the "Technology Program for the Economy", which supports SME and technology-oriented start-ups through subsidies from the Investment Bank NRW, funding between 25 and 40 % of services and technology-related capital goods.

Contests are another interesting incentive for innovation like the *Mittelstand* award, the InnoRegio contest, the BioRegio and EXIST contest. They are launched by the Federal Ministry of Economics and the Federal Ministry of Education and Research, respectively. The *Mittelstand* award is given to SME with outstanding product innovation. The InnoRegio contest is confined to the new *Länder*. Its main objective is the sustainable improvement of the employment situation and the strengthening of the competitive potential at the regional level. In order to achieve this objective, concepts and projects are to be developed at the regional level, aiming at the utilization of innovation potentials. The establishment of regional networks is also supposed to be fostered, where people from different fields of activity engage in joint innovation and learning projects (especially involving research institutions and enterprises). They are expected to develop ideas and visions in new cooperation patterns beyond administrative borders or department barriers. A limited number of regions, with particularly promising proposals, will then receive grant funding.

Another strategy is pursued by the BioRegio and the EXIST contest. Both are mainly directed at improving the technological and economical competitive advantage of Germany. In the case of BioRegio, scientific excellence in biotechnology research is brought together with industrial needs and interests, so that not only the share of new products reaching the market stage will increase, but new firms for biotechnological product and process development will also emerge. EXIST, on the other hand, aims at improving the entrepreneurial climate in Germany in general and at universities, polytechnics and research institutes in particular by transferring good practices in support for new businesses, developed in regional networks, to other regions and by stimulating similar activities at other locations (Koschatzky 1999: 12).

Table 10: Environmental programs

Support-program	Territory [1]	Area	Size of enterprise	Sector
ERP Environmental Program	ALL	Investments in energy efficiency measures, recycling etc.	SME	Handicraft, trade, manufacturing industry, tourism, transport industry, free-lance sector
DtA Environmental Program	ALL	Investments in energy efficiency measures, recycling etc	SME	Handicraft, trade, manufacturing industry, tourism, transport industry, free-lance sector
KfW CO_2-reduction	ALL	CO_2–reduction	ALL	ALL
Support of renewable energies	ALL	Investments in renewable energy	ALL	ALL

[1]NFS= New *Länder*, OFS= Old *Länder*, ALL= the whole of Germany (BMWi 1999)

Table 11: Venture and seed capital

Support program	Territory [1]	Area	Size of enterprise	Sector
ERP equity program	ALL	Refinancing of equity participation	SME	Handicraft, trade, manufacturing industry, tourism, transport industry
KfW risk capital program	ALL	Safeguarding from equity participation	SME	Handicraft, trade, manufacturing industry, tourism, transport industry
BTU	ALL	Equity Capital, R&D, Investments	SMALL	Handicraft, trade, manufacturing industry, tourism, transport industry

[1]NFS= New *Länder*, OFS= Old *Länder*, ALL= the whole of Germany (BMWi 1999)

5.3.4. Environmental programs

Numerous programs have been launched in Germany to encourage energy efficiency, the use of renewable energies, and recycling of materials. Energy saving and environmental programs receive support from the ERP, DtA and KfW funds. They offer long-term credits at favorable interest rates. They cater both to SME and large enterprises. The ERP and DtA environment programs supplement each other, while the KfW environment program can also be supplemented by the KfW *Mittelstand* program due the investment orientation of the latter.

Special programs support energy efficiency measures and renewable energy. The KfW CO_2-reduction program offers loans for energy efficiency investments of enterprises and private households. These loans can cover as much as the total sum of a given investment. The "Program for the Support of Renewable Energies," supported by the Federal Economics Office (*Bundesamt für Wirtschaft*), hands out subsidies for investments in solar collectors, water power plants, and others.

At the *Länder* level there are several programs to support the same areas and also special research projects which work in that area.

5.3.5. Venture and seed capital

The German business investment or venture capital market came into being in the 1960s when, against the background of increasing discussion on the lack of equity and the falling ratio of equity to total assets of small and me-

dium industry, banks set up the first business investment companies. These had the aim of making equity or equity-type funding available to SME which were not quotable at the stock exchange.

A second phase of the German venture capital market began in the early 1970s. Since 1970, the Federal Ministry of Economics, as administrator of the ERP Special Fund and other funds from KfW and DtA, has offered low-interest re-financing and guarantees for small and medium-sized firms. The intention was to stimulate the creation of business investment companies with an element of (regional) economic promotion, thus helping to secure existing SME in their region. However, private companies were making less use than had been expected of the ERP special fund offers. Thus, the *Länder* created *Mittelstand* equity share corporations (‘*Mittelständische Beteiligungsgesellschaften’*, MBGs), which commenced their business activities in the 1970s and the 1980s in all *Länder*. However, at that time – due to the ERP guidelines – the MBGs did not invest in new technology-based firms either, so that there was no supply of investment capital for this kind of firms. In particular, there was a lack of venture capital which was oriented towards long-term application and therefore did not put a strain on the liquidity of a new enterprise during the first years of its development.

The German business investment capital market entered its third phase in the early 1980s. This was preceded by information and discussions on the successful American venture capital model, in which equity plus management support were offered to new technology-based enterprises with a strong growth potential. A comparatively rapid development of the German venture capital market began. From 1983 to 1995 the volume of the market increased by seven times. The growth rates have been particularly high in the 1990s.

In the last years the German venture capital market entered another phase. A significant role was played by the pilot scheme "Business investment capital for new technology-based firms" (BJTU), which created favorable conditions for the founding of several seed capital companies and has also contributed to encouraging a number of existing business investment and venture capital companies to participate once more in the early development phases of new technology-based firms. A further important innovation was, in 1997, the creation of the "New Market", modeled after NASDAQ, as part of the Frankfurt stock exchange. By the end of 1999, more than 200 initial public offerings had taken place.

In Germany, the private and public banks in particular act as investors, providing considerably over half the volume of funding supplied by all business investment capital companies. In the new *Länder* the venture capital market is just in the process of formation, so that it is not yet possible to evaluate who the main investors are (Wupperfeld 1997: 149ff.).

5.3.6. Export and foreign economic relation support

The support of export activities for SME is ranging from information provision over support of participation in national and international fairs to export and investment credits as well as insurance programs and guarantees for investments in foreign countries.

Regarding participation in fairs, SME from East Germany are able to get support for national events, while support for participation in international fairs is available for all enterprises. The support consists mainly in covering a part of the fees for the stand at the fair.

An additional special offer for East German SME is the program for marketing, which is supposed to help them to define strategies and to sell their products on the European market.

Other institutions like the chambers of trade in other countries (*Auslandshandelskammern)* and the Federal Agency for Foreign Trade Information (*Bundesstelle für Außenhandelsinformationen*, bfai) provide specialized information about foreign markets. The Hermes export credit insurance is available for every enterprise. The ERP export financing program supports both German exporters and importers. To receive a credit from the ERP fund, an export has to be insured through Hermes.

There are two programs to support foreign investment. The guarantee for capital investments in foreign countries offers insurance for investments abroad, like German enterprises' share in foreign enterprises or wholly-owned subsidiaries. Another program is the KfW *Mittelstand* program (foreign countries). It provides SME with funds to finance all kinds of investments abroad (including acquisitions of other enterprises) based on a long-term credit. The KfW program and the guarantee for capital investment complement each other, just like the Hermes insurance and the ERP program.

There are several *Länder* programs to promote export and investments abroad. For instance, the NRW program 'Impulses for the Economy' gives special emphasis to SME and foreign markets. The program supports participation of SME in fairs and foreign economic consultancy through the German chambers of commerce abroad.

The chambers of industry and commerce and their national umbrella organization (DIHT) have launched the company pool program. The idea is to reduce the barriers SME face when they try to enter overseas markets, especially in developing countries. Between 12 and 20 companies, mostly from different branches, form a pool to cover the costs of one joint representative who acts as a kind of local representative of all the pool firms in one host country. About 60 pools are operating.

Table 12: Export and foreign economic relation support

Support program	Territory [1]	Area	Size of enterprise	Sector
National fair support	NFS	Participation in fairs	SME	Handicraft, trade, manufacturing industry, tourism, transport industry, freelance sector
Foreign fair support	ALL	Participation in fairs	ALL	Handicraft, trade, manufacturing industry, tourism, transport industry, freelance sector, private persons
Hermes export credit insurance	ALL	Risk reduction of exports	ALL	German Credit institutes and exporters
ERP export financing	ALL	Export credits	ALL	Industry
Guarantee for investments in foreign countries	ALL	German investments abroad	ALL	Enterprises located in Germany
KfW *Mittelstand*-Program (abroad)	ALL	Foreign investments, research and innovation	ALL	Handicraft, trade, manufacturing industry, tourism, transport industry, freelance sector

[1]NFS= New *Länder*, OFS= Old *Länder*, ALL= the whole of Germany (BMWi 1999)

5.3.7. Inter-firm cooperation

There are several programs which try to encourage horizontal and vertical inter-firm cooperation. One of them has been mentioned above: PRO INNO. It supports research projects of a group of SME of one branch. Moreover, the EU supports, with the 'Joined European Venture Program', the creation of transnational joint ventures between SME of different member states.

At the local level, many chambers have set up matching systems where SME can present themselves as potential cooperation partners or obtain information about other firms. Another initiative tries to encourage the cooperation between founders and experienced business leaders, for instance the Business Angel concept, based on experience in the U.S. The "Angel" does not only offer his know-how but also has a stake in the start-up. With the financial assistance of the KfW, the initiative for Business Angels has started a virtual forum in the Internet.

Other cooperation initiatives can be found in every *Land.* For instance, a construction handicraft network for cooperation was founded with financial resources of the NRW government; construction enterprises with complementary specialization profiles combine their offers, rethinking their working methods and adapting their strategies to increase their competitiveness. There are also many initiatives, organized by the chambers or the regional economic support agencies, where new entrepreneurs and more experienced ones meet to exchange experience.

There are also several programs addressing business-owners who are looking for successors. It has been estimated that about 300,000 SME with four million employees are potential candidates for such programs. The chambers and the Federal Ministry of Family, Women and Youth (BMFSFJ) have started an initiative to support matching between aging business-owners and potential successors, i.e. professionals who would prefer to take over an existing business rather than start a new one. A similar activity is part of the GO Initiative in NRW. The Initiative introduced a pilot project in the Ruhr Valley, the traditional industrial region of NRW. The chambers, regional economic promotion offices, and business associations are involved in this project.

6 Justification and significance of SME support policies in Germany

It is by no means self-evident that a country's government pursues a SME support policy. Many industrialized and developing countries have actually pursued large enterprise support policies in the past. The results have been mixed at best, and that was one of the reasons why meso-level policies, i.e. the whole set of specific policies to shape the business environment, came under criticism. All too often, this kind of policy leads to corporate welfare, pork-barreling, clientelism, corruption, a subsidy mentality, and other effects which hamper economic growth.

In such a perspective, it is notable that there is little debate on the general principles of SME support policies in Germany, even more so since "Ordnungspolitik", i.e. the economic sub-discipline which deals with the basic organization of economies and defines the features of a functioning market economy, is one of the few genuine contributions German economists made to the discipline in the 20th century. It seems that there is a kind of basic consensus regarding the necessity of SME

support. This is most likely based on three considerations.

First, there is the constitution, which establishes that Germany is a social market economy rather than a free market economy. Accordingly, there is widespread agreement that the government has to play an active role in the economy. Moreover, the constitution stipulates that the government has to take care to alleviate economic and social gaps between regions, thus establishing a regional policy which to some extent overlaps with SME support policies.

Second, there is the economic justification, which is largely based on market failure arguments and observations derived from institutional economics, such as bounded rationality and transaction costs. Certain market failures, such as underinvestment in R&D, affect all companies, independent of size. Additionally, SME suffer from specific market failures, such as barriers to entry and access to finance, and transaction costs, for instance in terms of access to foreign markets.

Third, there is the political and political economy argument. The SME segment is reasonably well organized – via chambers and their umbrella organizations, via dedicated sectoral associations, and via the *Mittelstand* caucus in the conservative party. Owners of small businesses are an important segment of the electorate. Moreover, coming to the political economy argument, it is hard to conceive why there should be no SME support in a functioning democracy – SME create jobs, job creation is a major issue for politicians, and therefore it is politically wise to come up with support measures. This is even more so in declining and structurally weak regions, where SME support is an important element of a whole set of emergency policy measures.

Yet, one may argue that a substantial gap exists between the expectations attached to SME support, and the degree of attention SME support receives in both the political and academic discussion, and its real impact. Since the wave of constant monitoring and evaluation, which is a prominent feature of Anglo-Saxon countries, has not yet swept over Germany, there is only a limited amount of impact assessments available so far. They show the following:

- Within the *Gemeinschaftsaufgabe* (which addresses not only SME), in the period 1996 – 1998 grants for firms in the old *Länder* amounted to DM 1,460 million, leveraging an overall investment of DM 12,687 million. Thus, 27,186 new jobs were created, and 88,795 existing jobs were secured (i.e. they might have vanished otherwise). In the new *Länder*, grants amounted to DM 17,009 million, and investment to 57,665 million, creating 107,546 new jobs and securing 330,096 jobs. An evaluation of the program, which investigated the period 1980 – 1989, found that on average 43,000 jobs were created annually, with each DM 1 million stimulating the creation of 39 new jobs. It also found that the overall goal, namely the reduction of regional disparities, was missed (Deutscher Bundestag 1999: 20).
- An evaluation of EU-financed regional policy activities (EFRE) in the *Land* of North Rhine-Westphalia, where stimulating private investment is one of the main activities,[30] especially targeting

30 It is, however, important to note that the bulk of funds went into infrastructure investment and recycling of real estate (i.e. cleaning the ecological burden from earlier phases of industrialization).

SME, found that, in the period 1994 – 1996, 1,047 grants to firms involved DM 181 million, leveraging private investment of DM 1,027 million and creating 3,222 new jobs.

- In 1996, an investigation of technology centers and incubators in both old and new *Länder* made the following observations (Sternberg et al. 1996: 190 ff). Their main effect is to support new firms in the first phase of expansion; in terms of inducing start-ups, the effects are negligible. The job creation effects are very limited, albeit it is important to note that the quality of jobs created in centers is very high. Technology transfer to firms outside the centers is very limited, and the synergy between firms inside the centers unsatisfactory. Apparently the potential of high-technology start-ups in Germany is limited and does not match the space available in centers, so that center managers lower entry barriers.
- In 1997, an evaluation of technology centers and incubators in the *Land* North Rhine-Westphalia (where about a third of such centers in Germany has been founded) came to the following conclusions (Elle et al. 1997: 3 ff). The *Land* government had spent DM 1.05 billion from 1984 to 1996 to found 52 centers, thus creating 330,000 square meters of high-quality business space. 55 % of the firms in the centers were start-ups, whereas 45 % were already existing firms which had been attracted to the center. After three years, 40 % of the firms had left the center, after five years 62 %. Survival ratios were just slightly better than those of comparable firms outside centers. Overall job creation amounted to about 17,000, many of which would have been created anyway. Net job creation was estimated to be somewhere between 2,000 and 4,000.

In terms of business incubation, the ever increasing efforts to foster private business have given rise to a new sector: subsidy consultancy. It has been estimated that between 1,500 and 2,500 different business promotion programs exist in Germany,[31] an observation which leads to metaphors such as "promotion jungle". Cutting a way through this jungle is no easy task, especially for SME, which – unlike large companies – can hardly afford a department which specializes in government relations and subsidy scanning. Moreover, support measures are diverse in all sorts of ways. Some programs have only limited funds available and are based on the first come, first take principle, which often implies that no funds are available towards the end of the fiscal year. Application procedures are not standardized, and the forms which have to be filled out are often quite comprehensive. In many cases, the time period between application and allocation is unpredictable. It is thus sensible to assume that risk and high transaction costs keep many SME from making use of government support measures.

The Advisory Committee on *Mittelstand* Policy, a body linked to the Federal Ministry of Economics which consists of SME association representatives and independent experts, has

In the period 1989 – 1996, investment grants amounted to DM 131 million, i.e. 6.7 % of the total, whereas one third of the funds were spent on recycling of real estate. Another third of the funds went into the creation of technology centers and incubators (TGZ) and training facilities (InWIS, MR & NEI 1997, p. 57 f).

31 "Auf der Jagd nach Subventionen", Handelsblatt, 22 July 1996.

drawn a straightforward conclusion: it proposed to reduce the number of government support programs and increase transparency, consistency, and efficiency (Mittelstandsbeirat 1999). Moreover, it proposed a rigorous evaluation of governmental intermediary institutions, with a discontinuation of those which are not highly significant. The only type of support activities which is affirmed are financing programs of government development banks. Rather than showering SME with inefficient support measures, the Committee argues, the government would be well-advised to pursue a rigorous policy of deregulation and liberalization. The document emphasizes tax reform, reduction of the government share in GDP and of levies on wages to finance social security (and actually a cut down of social security), reduction of unemployment support and other measures which encourage not to work, relaxation of layoff regulations, reduction of minimum wages, relaxation of working time limitations, consumer protection and environmental legislation.

This leads to one of the main paradoxes of SME support policy in Germany: Since the political rationale to pursue it is very strong, there are rather too many financial resources available, especially in declining and structurally weak regions, and therefore the framework conditions for rigorous evaluation and performance-related appraisal of the necessity of each single program and instrument are not favorable. One of the strengths of the German system thus turns into a disadvantage, namely the willingness of the government to shape economic restructuring rather than leave it to the anarchy of market processes. In this respect, it is important to note that in fact there has been a profound evolution of business support policies, moving from traditional, selective industrial policy (which often favored large enterprise) to generic support measures. However, the latter tend to be supply-driven, thus ironically reflecting one of the major problems of SME support measures in developing countries. To establish monitoring and evaluation systems, and make SME support (as well as other meso-level activities) more performance-oriented is one of the main challenges the German system is currently confronting.

7 Main challenges of German SME support policies

SME support policies in Germany are in a constant state of flux, reflecting newly arising problems, challenges and opportunities, as well as the decentralized structure of formulation and implementation, and foreign influences. In fact, the latter element, in the form of EU policies, played an increasingly important role in the last years, and there is no reason to believe that it will play a diminishing role in the near future. EU policy is changing German SME support policies in three ways.

First, the EU commission has pursued a restrictive and strict course regarding subsidy control, an area where it has a legally established mandate and thus does not depend on negotiations in the Council of Ministers. EU regulations governing subsidies to private businesses tend to be more restrictive than national regulations. In practical terms, this means that certain branches of industry and services are exempt from subsidies (e.g. declining industries with surplus capacities or shopping centers). It also means that well-established instruments, like support to firms which are in crisis, are no longer legal. In general terms, it means that business support, including SME support, is supposed to become less discretionary and more market-

oriented and generic. It also means that the traditional German way of supporting SME, i.e. very much in an ad-hoc manner, will have to give way to more thoroughly formulated policies.

Second, and related to the latter point, evaluation will become much more important. Within in the German system, monitoring and evaluation practices are at best rudimentary. It is mainly due to the pressure of the EU Commission that more systematic evaluations are conducted nowadays. This includes ex-ante evaluations, i.e. a more systematic appraisal of problems and planning of goals and measures, and ex-post evaluations, i.e. third-generation evaluations based on common methodologies and conducted by independent agencies.

Third, the most recent EU policy statement established that future SME support measures will have to address gender and environment issues. The first aspect did not appear at all in German SME support policies so far, except for a few special programs for business start-ups, and the second aspect played only a limited role, mainly with respect to investment in environmentally sound technologies and environmental management systems.

The new *Länder* continue to be another important issue of German SME support. Despite extensive support programs, business dynamics there are lagging in such a way that some observers express the concern that the region may turn into "Germany's mezzogiorno", and the fact that recent economic growth rates in the East were lower than in the West does little to alleviate such fears. It is now well-established that intense support will have to continue, and policy makers will continue to experiment with new and improved instruments.

Another tendency which will probably continue is to focus private sector-oriented support programs specifically on SME. In particular, this applies to R&D support, which tended to have a large enterprise bias in the past, not the least due to costly programs in areas like space research and nuclear and fusion energy. So far, SME participation in R&D programs and interaction between R&D institutions and SME is moderate at best.

There is another tendency, namely towards public-private partnership and network-based programs. Reasonably effective and efficient activities like the GO Initiative probably show the shape of things to come. In particular, this may lead to efforts to move from supply-driven measures to a balance between supply- and demand-driven activities.

Finally, there will be an increasing pressure on ministries to prove the efficacy of support policies. In the past, the main indicator of program success was that the available funds were spent, and spent in an orderly way, at the end of a budget year. With the pressure on governments to cut their budgets being on the increase, it is likely that business support programs will come under increased scrutiny. Likewise, the performance pressure on institutions like technology centers, incubators, and training center, as well as chambers and other private sector organizations, will increase. In the past, it was virtually unthinkable that government-funded support institutions with unsatisfactory performance were closed down. Such measures are becoming thinkable.

8 Policy conclusions for Latin America

The main message of this paper is: The Germany economy has a strong base of SME, even though it is less SME-based than is often

assumed. The strong performance of SME in Germany is due to

- at the macro-level, a setting of stable macroeconomic, political and regulatory framework conditions, including the functioning of markets and a comparatively limited anti-SME bias. In particular, SME do not encounter systemic obstacles in terms of access to credit and continuous technological upgrading.
- at the micro-level, a quality-based pattern of competition between SME and a strong reliance of large companies, many of them heavily exposed to global competition, on competitive SME suppliers.
- at the meso-level, a strong basic business support structure (institutions and instruments) at federal, *Land* and local levels, based on both governmental and private sector organizations, which is complemented by specific SME support programs which address specific challenges, rather than substitute for weak generic support structure or adverse macro-economic conditions. These programs are more than just icing on the cake, but even without them Germany would probably have a strong base of SME.
- at the meta-level, a value system which encourages entrepreneurship and achievement, as well as societal institutions which create favorable conditions for a dynamic development of the private sector. This includes a commitment of the political system for actions to shape a supportive environment for companies, including SME, and recently especially addressing SME. Many of the typical problems of collective action (e.g. vocational training, R&D) were solved through the creation of specific institutions a long time ago. Relationships between major societal groups, despite being conflictive, are often problem-solving oriented, and the successful resolution of profound conflicts reinforces this orientation. In particular, there are functioning communication channels between government and the private sector, both informally and on an institutional basis.

In other words, Germany has not found some kind of magic formula to create a particularly dynamic SME sector. Rather, SME and SME support are an essential element of an overall system which favors industrial growth. In terms of policy recommendations for Latin American countries, the conclusions to be derived from the German experience are straightforward:

- At the meta-level, strengthen those elements which favor entrepreneurship and a business-friendly environment. Moreover, it is not sufficient to have a rhetoric of creating favorable conditions for entrepreneurial activities. Consistence between rhetoric and practice is essential.
- At the macro-level, secure framework conditions which create a competitive structure of markets. An important reason of the mediocre performance of SME is that they are often crowded-out by large firms which can exploit market failures or privileged access to the government. Another reason is the fact that SME sometimes can survive by producing mediocre products and selling them to non-demanding customers. Further key issues are the establishment and enforcement of property rights, and the availability of means of conflict resolution, such as fair and effective law courts.

- Still at the macro-level, alleviate the anti-SME bias in the economy, especially with respect to the amount of time a business has to spend to deal with cumbersome government regulations, and regarding access to credit and other market failures.
- At the meso-level, strengthen generic business support structures (e.g. the financial system, including guarantee banks and specialized export finance and insurance institutions).
- Additionally at the meso-level, create SME support institutions with a clear focus, on top of generic support structures, rather than cover-all organizations. Both specialization and rivalry can improve the performance of support institutions.
- Still at the meso-level, support restructuring of business associations. They can play an important role in articulating demands of the private sector, especially SME, as well as in providing services to member firms. However, business associations tend to be weak in most Latin American countries.
- In terms of geographical aggregation, create decentralized, competent institutions and self-help organizations. The solution of general problems, like access to credit, is one thing, which in most cases has to be done at the national level (unless local credit cooperatives are a viable option). Addressing the specific problems of a given set of SME is another thing, and here problems tend to be idiosyncratic and localized. National organizations will find it difficult to address such problems, especially in medium and large countries.

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Annex

1 Overview of the Conditions of some Credit Programs

PROGRAM	DURATION/YEARS FREE OF PREMIUM	INTEREST RATE EFFECTIVE IN % P.A.
ERP-equity support (EKH)	West 20/10. east 20/10	5.57/5.29
ERP-start-up	West 15/3. east 20/10	4.32/3.8
DtA-Start-up	10/2	4.85
DtA-Startgeld	10/2	6.4
ERP-Regional Program	10-15/2	4.32
ERP-Construction Program	15-20/5	3.80
KfW-*Mittelstand* program	10/2 and others	4.85
ERP-Environmental Program	West 10-15/2. east 15-20/5	4.32/3.8
DtA-Environmental program	10/2	4.85
KfW-*Mittelstand* program (foreign country)	10/2	4.85

2 Internet information and adresses

Institutes focusing at SME-research

Institut für Mittelstandsforschung Bonn (IFM):
http://www.ifm-bonn.org

Rheinisch-Westfälisches Institut für Wirtschaftsforschung:
http://www.rwi-essen.de/

Institut für Mittelstandsforschung Universität Mannheim:
http://www.ifm.uni-mannheim.de/

Meso institutions

Steinbeis Foundation:
http://www.stw.de

Guarantee banks:
http://www.buergschaftsbank.de

ZENIT:
Http://www.zenit.de

Euro Info Centre:
http://www.eic.de

Association of Technology Incubators in Germany:
http://www.adt-online.de

Sparkasse:
http://www.sparkasse.de

Arbeitsgemeinschaft industrieller Forschungsgemeinschaften Otto von Guericke e.V.
http://www.aif.de

Rationalisierungskuratorium der Deutschen Wirtschaft (RKW):
http://www.rkw.de

Business Angels Germany:
http://www.businessangels.de

Chambers:
http://www.ihk.de, http://www.diht.de, http://www.hwk.de

Federal Information Service for foreign trade (bfai):
http://www.bfai.de

Start-up network:
http://www.existenzgruender-netzwerk.de

Fraunhofer Society:
http://www.fhg.de

Max-Planck-Society:
http://www.mpi.de

Go-Initiative:
http://www.gfw-nrw.de

Databases about support programs:

Programmes in Germany on the federal, regional and European level:
http://www.bmwi.de/foerdb/

R&D information service about programmes of the EU:
http://www.cordis.lu

SME- information from the Ministry of Economics:
http://www.bmwi.de