

# DEVELOPING EXCELLENCE IN MEDICAL TECHNOLOGIES

## Survey Report for Germany

A report prepared for  
Advantage West Midlands

Institute for Employment Research  
Warwick Manufacturing Group  
Economix Research and Consulting  
Ramboll Management

Email: [vogler-ludwig@economix.org](mailto:vogler-ludwig@economix.org)



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# 1. Organisation of fieldwork

The English questionnaire was translated into German without alterations or amendments. Section A was used to check the product profile of companies in order to identify the company as a sample element. Beginning with Section B the questionnaire was split up into two sections both containing the same questions but different wording for companies exclusively producing medical products and companies with a wider product spectrum including non-medical products. This was done for interview purposes only, as the wording of questions was different in the two cases.

The fieldwork was undertaken in the 47 to 49 calendar week of 2003 by a staff of 5 interviewers. All interviewers were instructed in detail in both, interview and contact techniques and understanding of the questionnaire. The interview activities were controlled by daily records on the number and distribution of interviews and refusals.

The interviews were conducted with company managers, heads of human resource departments, and other management representatives. The interview time was 21.4 minutes on average with a standard deviation of 10.1 minutes. For every successful interview 3 additional calls were required to gain the participants.

## 2. Bavaria

### 2.1. Sample

**Population of MedTech companies:** The sample of medical technology companies was taken from the databank of the Bavarian Ministry for Economic Affairs, Transport and Technology (*Bayerisches Staatsministerium für Wirtschaft, Verkehr und Technologie*)<sup>1</sup>. This databank contains over 600 companies in the sector of medical technologies which were checked as regards coverage of the sector and the type of medical products. Additional companies were included based on address lists from business associations in the medical technology sector. A gross sample of 642 companies was used for the telephone survey. The sample included 381 companies from the region of München/Oberbayern and 261 companies from Nürnberg/Erlangen (Table 2.1). The average response rate was 19.9 %.

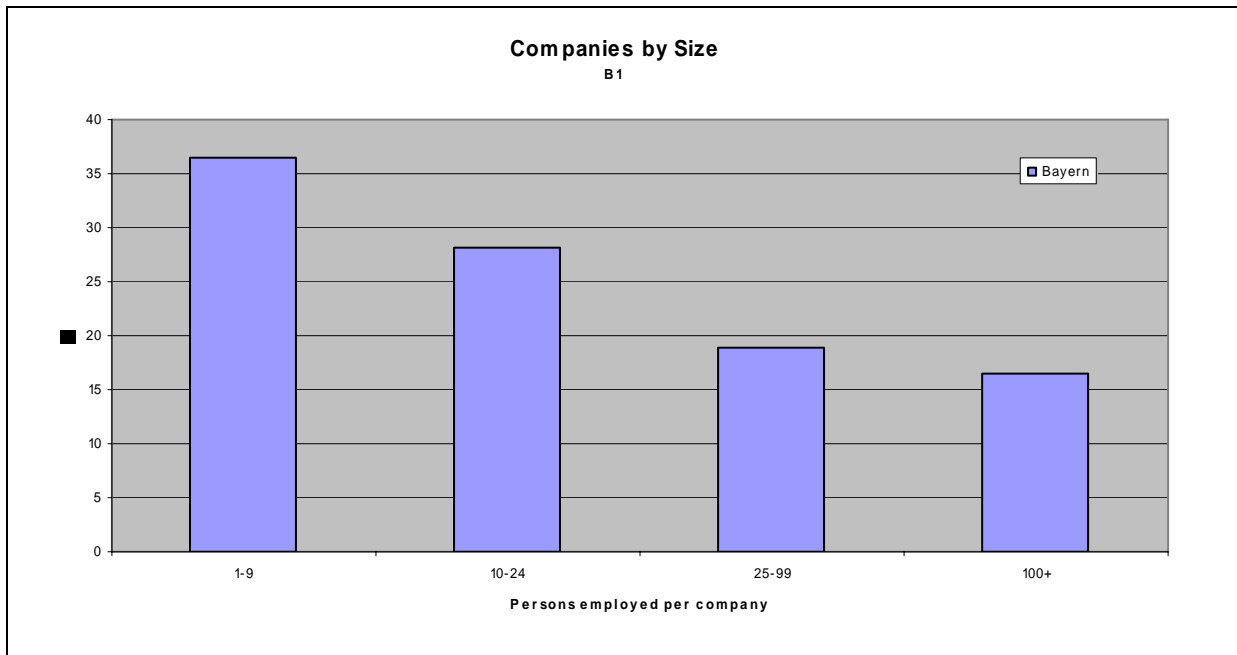
Table 2-1 Regional structure of the sample - Bavaria

	Companies	Interviews	Response rate (%)
Nürnberg/Erlangen	261	47	18,0
München/Oberbayern	381	81	21,3
Total	642	128	19,9

**Size structure (B1):** The size structure of the sample is represented by Chart 2-1. One third of the companies have less than 10 workers (including self-employed persons), one fourth has a workforce between 10 and 24 workers. 18 % have 25-99 workers and 16 % 100 and more. The sample contains 5 companies with more than 1000 employees.

<sup>1</sup> Bayern International GmbH (2002): Key Technologies in Bavaria. Munich.

**Chart 2-1 Companies by size of workforce – Bavaria**



**Main products (A3):** Most of the companies are producing medical devices (53 %; multi-responses possible). 11 % are producing e-healthcare and 9 % surgical devices. The other companies are distributed among the remaining products with shares below 5 %. 15 % are listed among “Others”, mainly business services concerning technical testing, logistic services and distribution.

**Table 2-2 Main products – Bavaria**

Bavaria Main Products	N (multiple responses)	% of Responses
Medical Devices	68	47,2
Surgical Devices	12	8,3
Orthotics	4	2,8
Prosthetics	1	0,7
Rehabilitation	4	2,8
Wound care	2	1,4
Imaging/ modelling	6	4,2
Innovation support and infrastructure	6	4,2
Biomaterials	1	0,7
Ophtalmology	6	4,2
E-Healthcare	14	9,7
Pharmaceuticals	1	0,7
Other	19	13,2
Total responses	144	100,00
Cases = 128		

**Turnover (F1):** Almost one third of the companies had a turnover of less than 1 million € over the last 12 months. Further 39 % range between 1 and 5 million €, and 11 % between 5 and 10 million €. 18 % have a turnover of more than 10 million €. Among them are 2 % with more than 500 million €.

**Table 2-3 Total sales during last 12 months - Bavaria**

Turnover	% of companies
less than 1 Mio. €	31,3
1 - 3 Mio. €	26,8
3 - 5 Mio. €	11,6
5 - 10 Mio. €	10,7
10 bis 50 Mio. €	12,5
50 - 100 Mio. €	2,7
100 - 500 Mio. €	2,7
500 Mio. or more	1,8
Total	100,0

**Turnover with medical products (F2):** The vast majority of companies is specialised on medical products: 79 % make 80 and more percent of their turnover with medical products. 75 % are exclusively producing medical products.

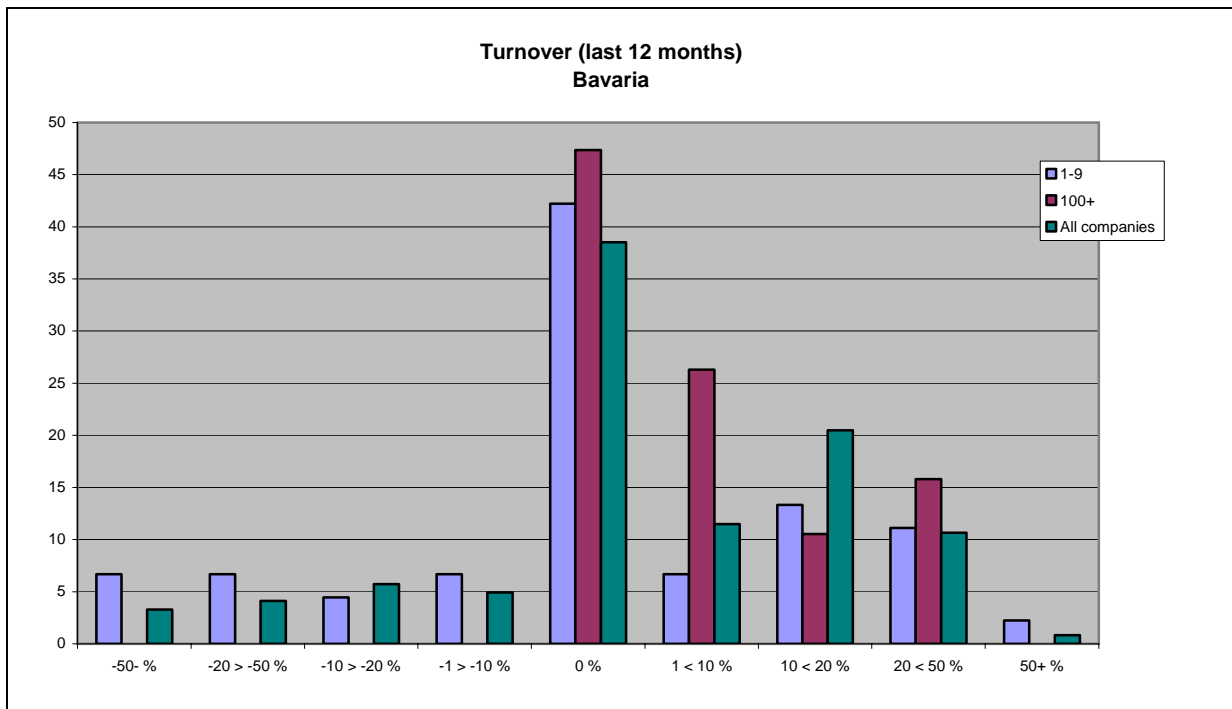
**Table 2-4 Share of medical products in total turnover during last 12 months - Bavaria**

% of turnover	% of companies
>20	6,4
20 < 50	8,8
50 < 80	5,6
80+	79,2
Total	100

## 2.2. Product markets

**Turnover growth during last 12 months (F3):** Turnover growth was positive for most of the companies. 43 % expanded turnover, 39 % had stagnating figures and 18 % experienced declining turnover. In particular larger companies were exclusively among the stagnating or growing firms, in parts with considerable growth rates of more than 20 %. Among small companies the growth performance was significantly more scattered (Chart 2-2).

**Chart 2-2 Turnover (last 12 months) – Bavaria**



**Turnover during the next 12 months (F4):** Companies are expecting positive growth rates for the next 12 months. 48 % are expecting slow or rapid growth of turnover, 38 % calculate with stable turnover figures, and 14 % assume negative trends (Table 2.5)

**Table 2-5 Turnover expectations (next 12 months) - Bavaria**

Growth expectation	% of companies
Grow rapidly	14,8
Grow slowly	32,8
Remain stable	37,5
Decline slowly	9,4
Decline rapidly	3,1
Don't know	2,3
Total	100,0

**Export share (F5):** A majority of 72 % of the companies is exporting products. One quarter has a low export share of less than 20 % and another quarter exports more than half of turnover. 19 % export between 20 to 50 % (Table 2.6).

**Table 2-6 Export share - Bavaria**

Export share	% of companies
No exports	28,0
< 20 %	26,4
20 < 50 %	19,2
50 + %	26,4
Total	100,0

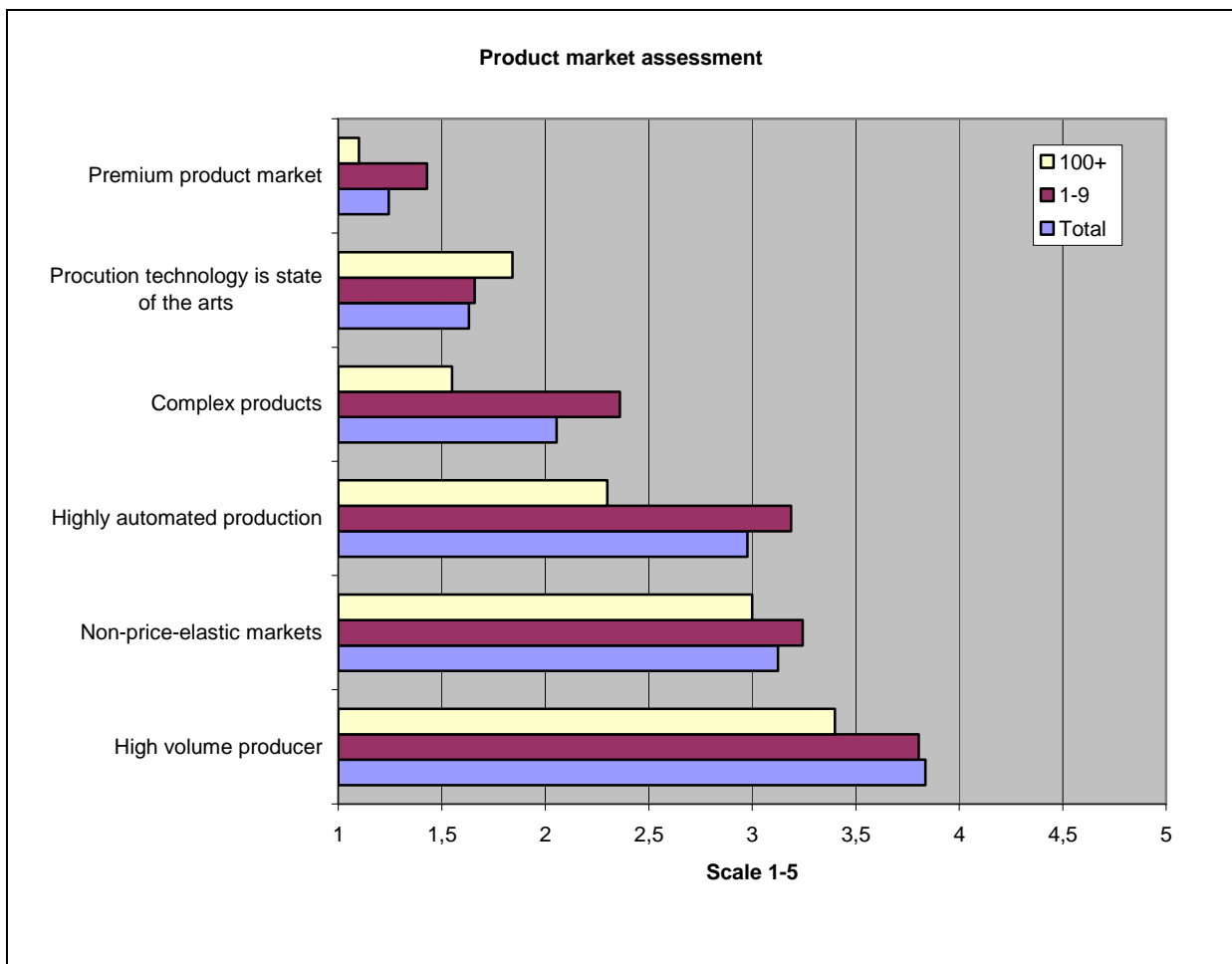
**Main clients (E1):** Two thirds of the companies have health services (hospitals, doctors, health insurance) as their main clients, 28 % make their sales with distributors and 27 % with other manufacturers (multi-responses possible). Direct sales to patients are not dominating (13 %).

**Approval of products (E2):** In 70 % of the companies the products require the approval by a regulatory authority. In the majority of companies almost all products need an approval: in 46 % of the companies all products need an approval and in further 7 % almost all products.

**Product market assessments (E3):** Following their own assessment, companies are working on premium product markets (average level of 1.4 on the scale from 1 to 5), and their production technology is state of the arts (1.8). The complexity of products is high (2.1). The production volume is low (3.8 for high volume producer) and the degree of automation is assessed as medium (2.9). Product markets are price-elastic (3.1 for being non-price-elastic).

Differences between companies of different size appear mainly regarding the complexity of products and the level of automated production.

**Chart 2-3 Product market assessments – Bavaria**

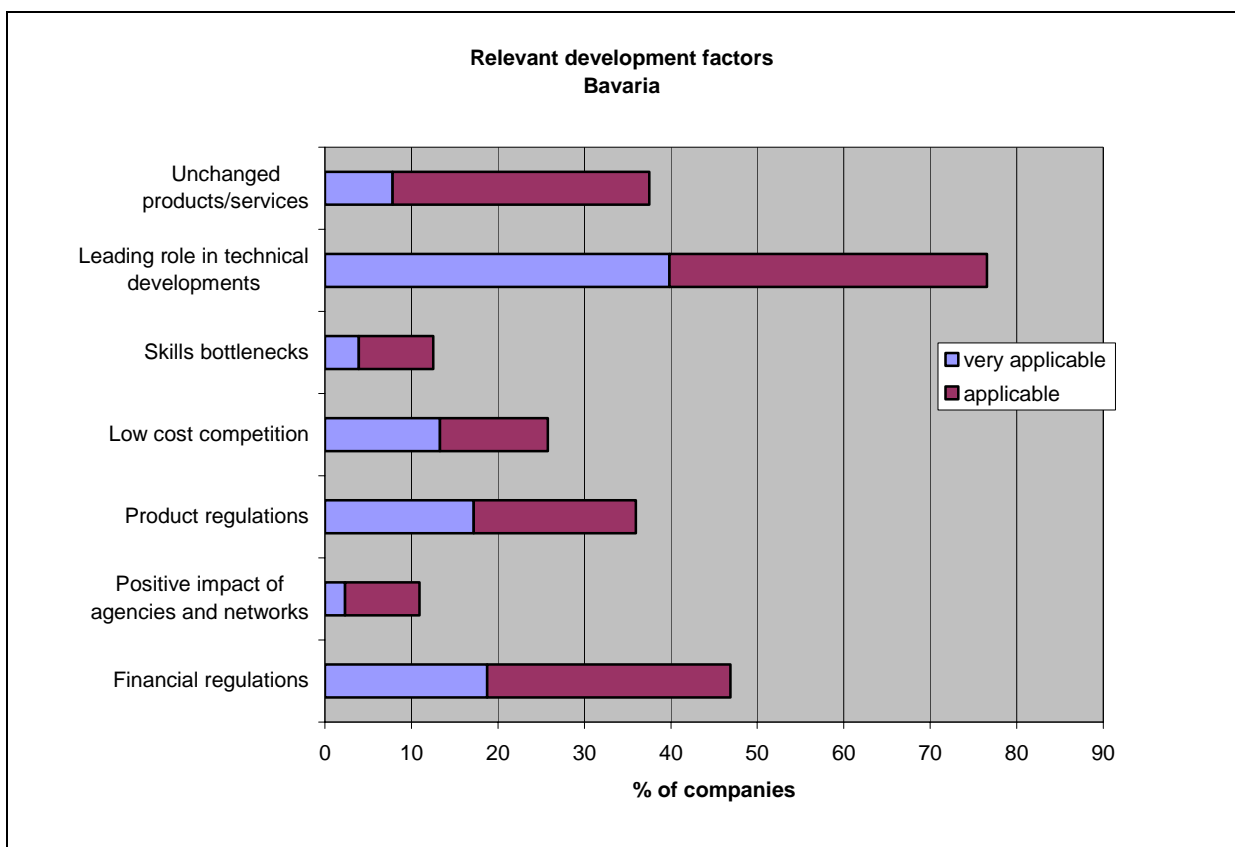


**Determinants of company development (E4):** Companies are convinced to play a leading role in technical product development (37 % say that this is applicable and 40 % say it is very applicable; Chart 2-3). For the majority of companies products and services have changed during the last years (38 % for unchanged products and services).

Financial regulations by public health care system are relevant for the development of the business for 48 %. Product regulations and approvals are important for 37 %.

Low cost competition by foreign countries is a minor factor which appears as relevant for 26 %. Skills bottlenecks are important to 13 %. The impact of regional development agencies or networks is relevant only for 11 % of the companies.

**Chart 2-4 Relevant development factors – Bavaria**

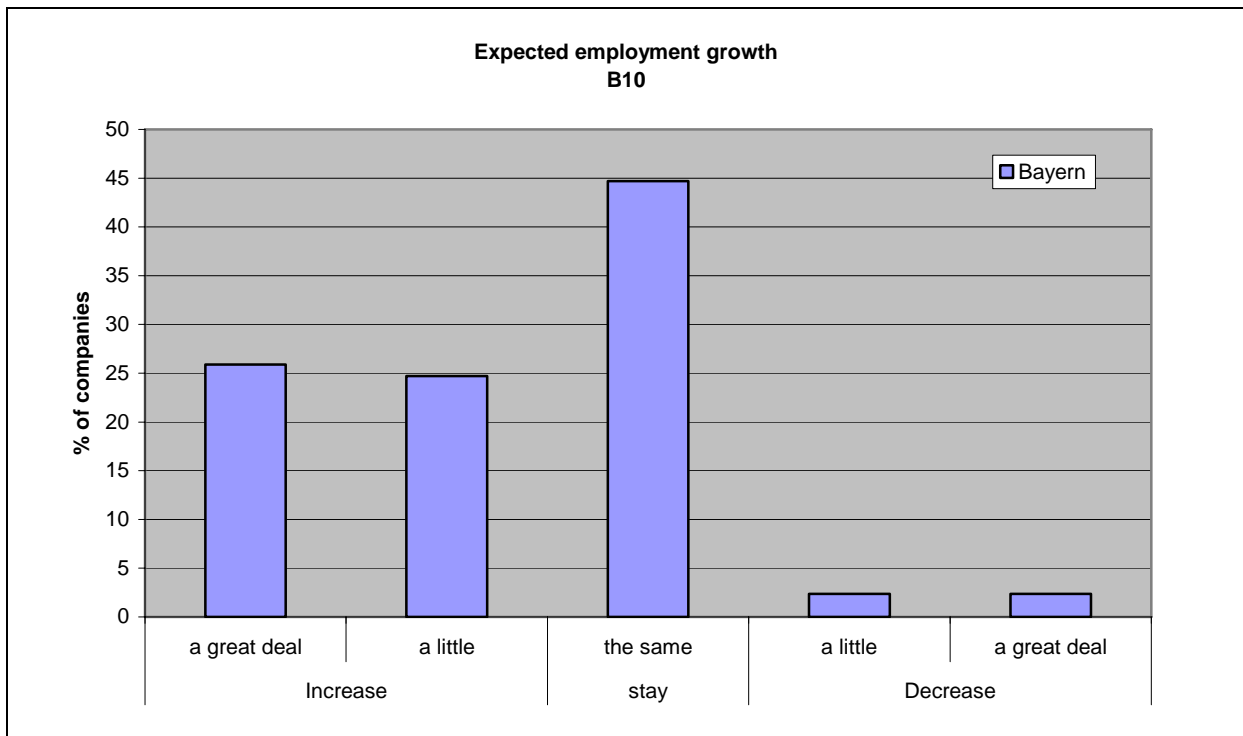


**Capacity utilisation (B11):** Production capacities in medical production are largely utilised: 54 % of the companies work at full capacity, 16 % are at overload. 30 % are below normal capacity utilisation. Smaller companies show a more dispersed picture of capacity utilisation with higher shares below as well as above normal levels.

**Expected employment growth (B10):** In their majority, companies are optimistic about further employment growth during the next 12 months (Chart 2.5). Half of them expect an increase of employment, 25 % even a strong increase. 45 % expect stagnating employment and only 5 % expect negative employment trends.



Chart 2-5 Expected employment growth – Bavaria



### 2.3. Employment

**Employment growth in medical production (B2, B3):** The average growth rate of employment in medical production was 4.4 % during the last 12 months (Chart ..). Companies with more than 25-99 workers grew stronger than the average (+11 %). Employment in small companies stagnated (+0.3 %).

**Fluctuation rates and reasons (B4):** About 7 % of the workforce left the medical departments of the companies during the last 12 months. In smaller companies with less than 25 workers the fluctuation rate was 3 to 4 times higher than in bigger companies (10 % as compared to 2.5 %).

**Reasons for job quits (B5):** As far as companies knew about the reasons for quits, most of the workers left the company due to dismissals by the company (44 % among multi-response reasons) or because they were made redundant (20 %). For further 43 % experienced a career break of the lack of career opportunities. Only 17 % left the company due to better payment elsewhere.

**Skills structure of the workforce (B6, B7):** On average 58 % of the work force are skilled workers (i.e. apprenticed employees) while only 6 % are plant and machinery operators. 13 % are scientific staff and engineers, and 15 % are managers (8 % remaining as others). 12 % hold a degree in engineering science, and 4 % a degree in medical science.

**Research & Development (B8, B9):** 14 % of the staff are engaged in research & development activities. Small companies have almost a double share of R&D staff. 46 % of the companies, however, do not undertake R&D, while 35 % get R&D services done at

the head office. The remaining 20 % externalised R&D to local companies (9 %) or to far-distance companies (11 %).

**Recruitment during last 12 months (C1, C2):** 56 % of the companies recruited new staff during the last 12 months. Even one fourth of the companies with less than 10 workers made hiring. The average hiring rate (of companies with hiring during the last 12 months; related to total company employment) was at 7 % for all companies. In small companies it was slightly higher than in large companies.

**C3, C4 (not yet classified)**

**Hard to fill vacancies (C5):** 55 % of the companies which recruited people during the last 12 months had hard to fill vacancies, in particular small companies and companies with more than 100 employees.

**Lacking skills (C7, C8, C9):** The scope of lacking is skills is widely distributed. On average, almost 5 items were nominated among the 16 alternatives. A certain concentration of answers (50-60 %) can be discerned on communicative skills (general communication, customer handling, problem solving). 40 % of the answers fall on the lack of clinical and medical skills equalised by missing foreign languages skills. The reason why the vacancies were hard to fill was in the majority of cases (68 %) the lack of qualifications which the company demanded. 30 % missed a sufficient number of applicants with the required skills.

About on third of companies reported of occasional or regular difficulties, arising with hard to fill vacancies.

**Former job of recruited workers (C11):** Most of the persons recruited during the last 12 months were coming from other industries (28 %), or from the medical industries (20 %). A significant share was also coming from unemployment (20 %). The others came from the mother company or R&D activities.

**2.4. Human resource management**

**Skill levels (D1):** The level of proficiency decreases with the functional position of staff members. Managers were given a level of 1.7 within the scale of 1 to 5 (Table 2.2). Professional scientists and engineers were close to that with a level of 1.8. Skilled trades occupations got 2.0 and semi-skilled workers 2.4. Skills assessments were generally lower by 0.2 points in larger companies (100+) than small companies.

There was no company which assessed their staff to be less than fully proficient at their job in any of the functional groups.

**Table 2-7 Skill levels of staff - Bavaria**

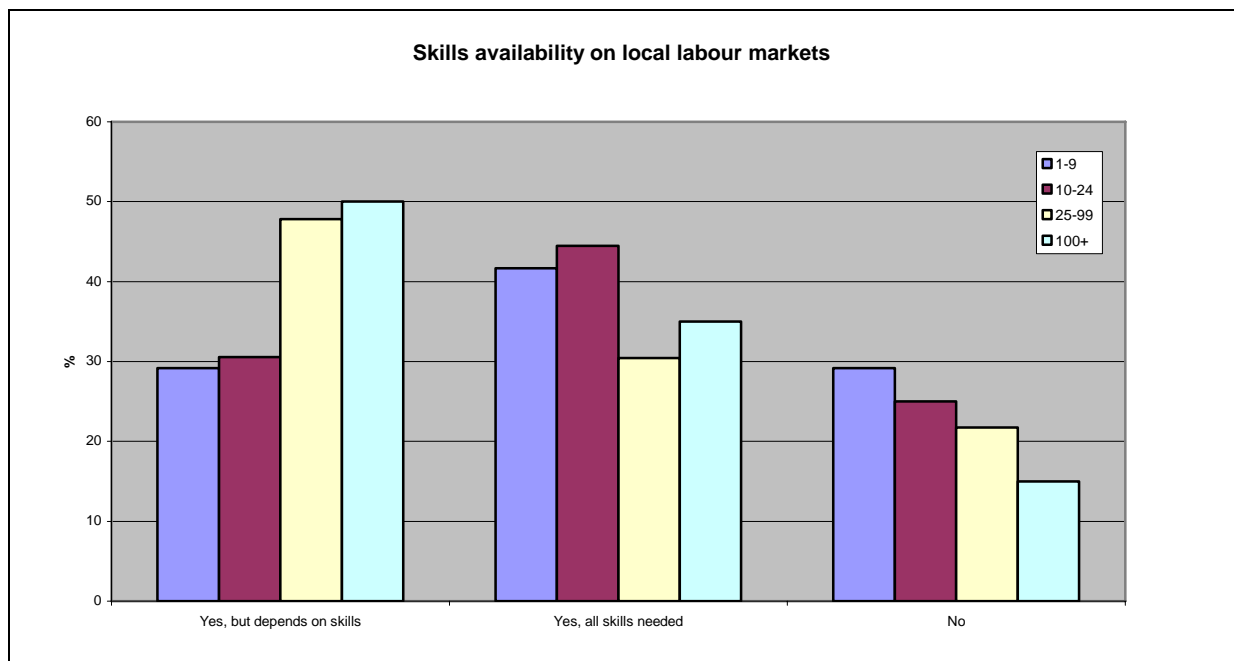
	Persons employed per company				Total
	1-9	10-24	25-99	100+	
Managers	1,7	1,6	1,7	1,9	1,7
Professional scientists and engineers	1,7	1,6	1,8	2,0	1,8
Skilled trades occupations (i.e. fully apprenticed manual employees)	2,0	1,9	1,9	2,2	2,0
Process, plant and machine operatives (i.e. semi-skilled production workers)	2,3	2,1	2,4	2,5	2,4

**D2-D7: not applicable.**

**Risks for future proficiency (D8):** The future proficiency of the staff is put at risk mainly due to time and cost restrictions. The lack of time for training (52 %), lack of cover for training periods (42 %) and financial restrictions (31 %) were the answers chosen most frequently. These answers are also significantly correlated. The lack of courses in the area or a general lack of courses was identified by 26 % or 20 % of the companies. The unwillingness of the staff was mentioned by 15 %. High staff turnover seems to be a minor problem for only 6 % of the companies. 23 % do not see any barriers to the improvement of staff proficiency.

**Skills availability on local labour markets (D9):** Over 40 % of the smaller companies (< 25) find all skills needed on local labour markets, and close to 50 % of the bigger companies find at least parts of the skills needed depending on the specific qualification (Chart 2.3). The share of companies which do not find the skills required is 24 %. Most importantly, a greater share of smaller companies experience skill problems as compared to bigger companies.

**Chart 2-6 Skills availability on local labour markets - Bavaria**



**Preparation of staff for future challenges (D11):** 61 % of the companies assess their staff to be well prepared for future challenges on product markets, and one third thinks to be very well prepared. Only for 6 % of the companies staffs seem to be not so well prepared. These are bigger companies (100+) in the majority.

**Future difficulties to obtain required skills (D12):** Two thirds of the companies do not expect difficulties in getting the skills required. The one third which expects such difficulties gives the indication that technical skills in particular will be difficult to recruit. Medical and clinical skills are not mentioned. Various comments refer to general marketing and sales competences which are expected to be scarce.

### 3. Baden-Württemberg

#### 3.1. Sample

**Population of MedTech companies:** The sample of medical technology companies was taken from the databank of the Baden-Württemberg Agency for International Economic Cooperation<sup>2</sup>. This databank contains over 300 companies in the sector of medical technologies which were checked as regards coverage of the sector and the type of medical products. Additional companies were included based on address lists from business associations in the medical technology sector. A gross sample of 298 companies was used for the telephone survey. The sample included 187 companies from the region of Tuttlingen/Südbaden and 140 companies from Stuttgart and other Baden-Württemberg (Table 3.1). The average response rate was 22 %.

**Table 3-1 Regional structure of the sample - Baden-Württemberg**

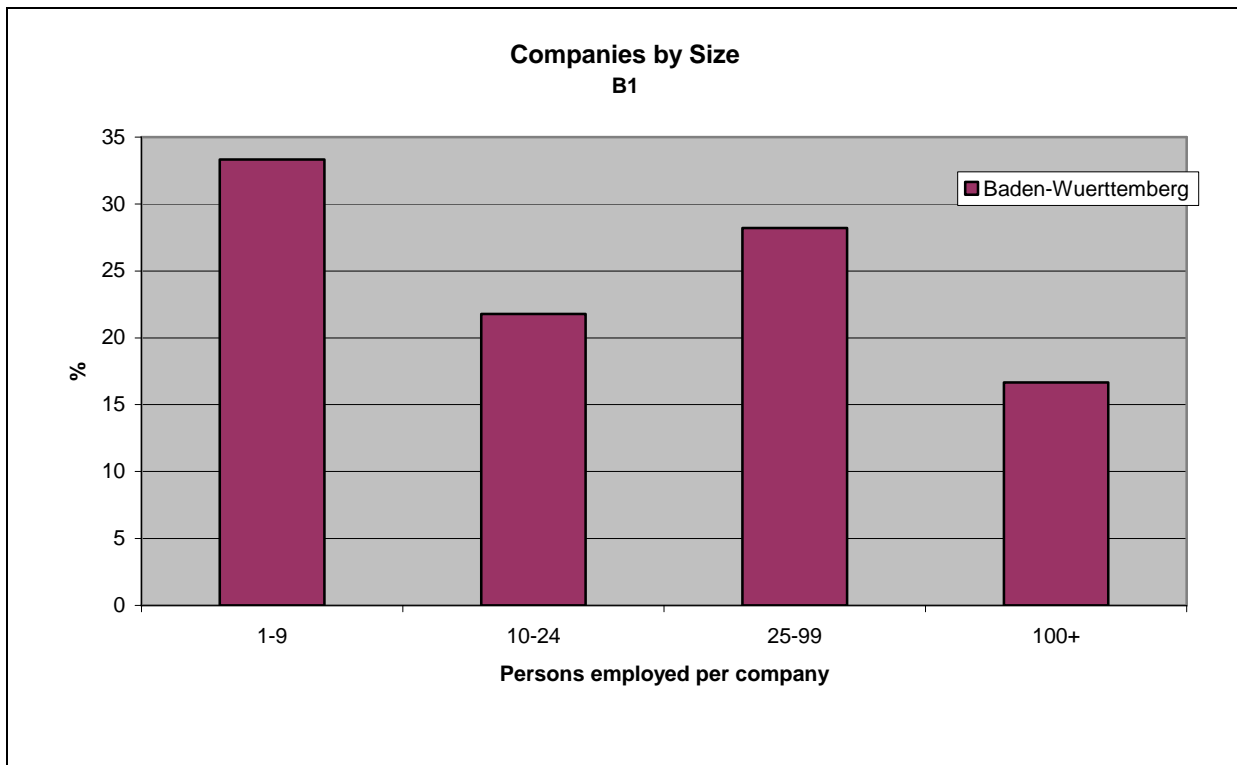
	Companies	Interviews	Response rate (%)
Stuttgart/other BW	140	27	19,3
Tuttlingen/South-Baden	187	51	27,3
Total	352	78	22,2

**Size structure (B1):** The size structure of the sample is represented by Chart 3-1. One third of the companies have less than 10 workers (including self-employed persons), one fifth has a workforce between 10 and 24 workers. 28 % have 25-99 workers and 16 % 100 and more.

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<sup>2</sup> Baden-Württemberg Agency for International Economic Cooperation (2003): Medical Technology – Discover Europe's most innovative region. Stuttgart.

**Chart 3-1 Companies by size of workforce – Baden-Württemberg**



**Main products (A3):** Most of the companies are producing medical devices (53 %; multi-responses possible). 11 % are producing e-healthcare and 9 % surgical devices. The other companies are distributed among the remaining products with shares below 5 %. 15 % are listed among “Others”, mainly business services concerning technical testing, logistic services and distribution.

**Table 3-2 Main products – Baden-Württemberg**

Main Products	N (multiple responses)	% of Responses
Medical Devices	20	23,8
Surgical Devices	29	34,5
Orthotics	4	4,8
Prosthetics	2	2,4
Rehabilitation	1	1,2
Imaging/ modelling	2	2,4
Innovation support and infrastructure	4	4,8
Ophtalmology	3	3,6
E-Healthcare	1	1,2
Verterinary	1	1,2
Other	17	20,2
Total responses	84	100
Cases = 78		

**Turnover (F1):** 8 % of the companies had a turnover of less than 1 million € over the last 12 months. Further 46 % range between 1 and 5 million €, and 13 % between 5 and 10 million €. 32 % have a turnover of more than 10 million €.

**Table 3-3 Total sales during last 12 months - Baden-Württemberg**

Turnover	% of companies
less than 1 Mio. €	7,9
1 - 3 Mio. €	26,3
3 - 5 Mio. €	21,1
5 - 10 Mio. €	13,2
10 bis 50 Mio. €	23,7
50 - 100 Mio. €	5,3
100 - 500 Mio. €	2,6
Total	100,0

**Turnover with medical products (F2):** The vast majority of companies is specialised on medical products: 74 % are exclusively producing medical products. 85 % make 80 and more percent of their turnover with medical products. Only a very small section produces medical products as a by-product.

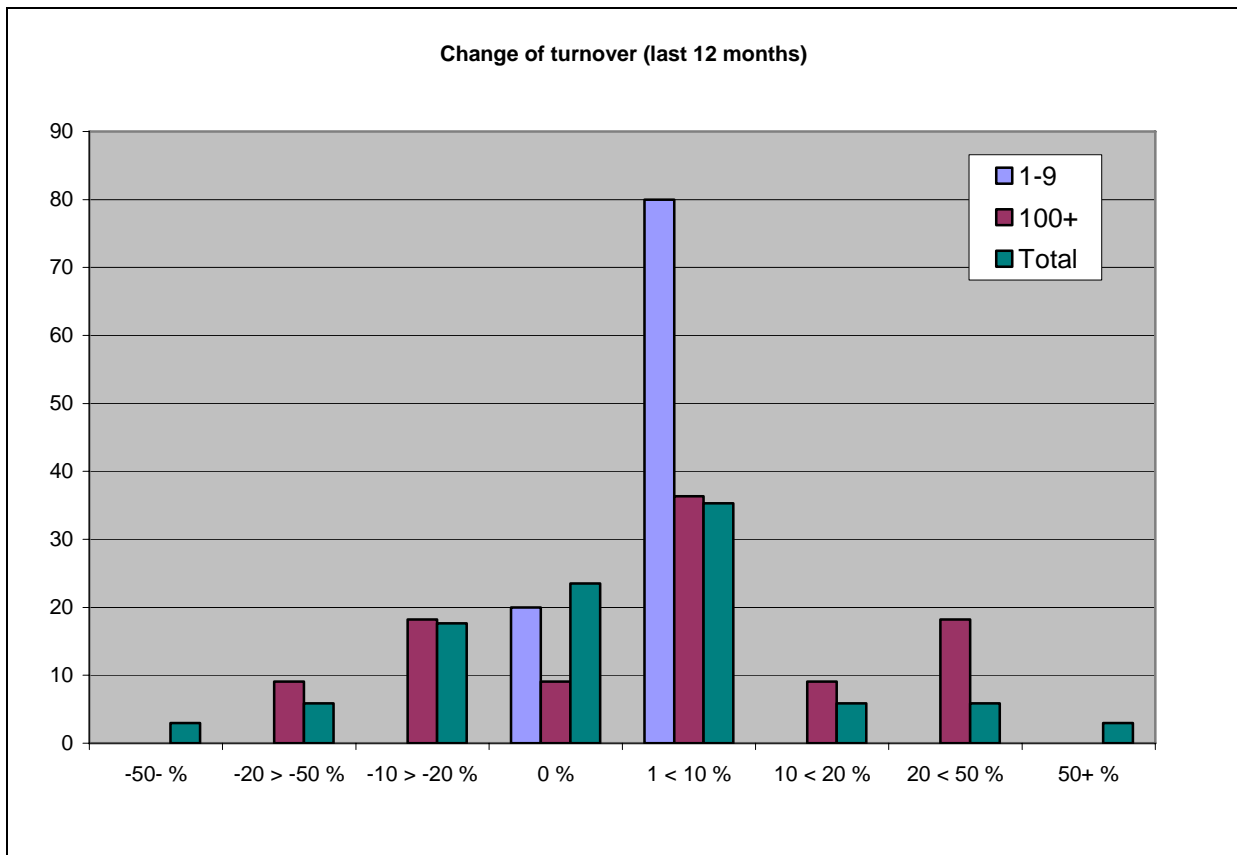
**Table 3-4 Share of medical products in total turnover during last 12 months - Baden-Württemberg**

% of turnover	% of companies
>20	4,9
20 < 50	7,3
50 < 80	2,4
80+	85,4
Total	100,0

### 3.2. Product markets

**Turnover growth during last 12 months (F3):** Turnover growth was positive only for parts of the companies (26 %) while it stagnated over the last 12 months for 35 % and decreased for 26 %. Small companies experienced slight increase of turnover (for 80 % of the companies with less than 10 workers). Larger companies, however were affected by decrease of turnover.

**Chart 3-2 Turnover (last 12 months) – Baden-Württemberg**



**Turnover during the next 12 months (F4):** Companies are expecting slow growth for the next 12 months. 53 % are expecting slow or rapid growth of turnover, 33 % calculate with stable turnover figures, and 15 % assume negative trends (Table 3.5)

**Table 3-5 Turnover expectations (next 12 months) - Baden-Württemberg**

Growth expectation	% of companies
Grow rapidly	2,5
Grow slowly	50,0
Remain stable	32,5
Decline slowly	15,0
Total	100,0

**Export share (F5):** A majority of 77 % of the companies is exporting products. 15 % has a low export share of less than 20 % but half of them export more than 50 % of turnover. 23 % have an export share between 20 to 50 % (Table 3.6).

**Table 3-6 Export share - Baden-Württemberg**

<b>Export share</b>	<b>% of companies</b>
No exports	12,5
< 20 %	15,0
20 < 50 %	22,5
50 + %	50,0
Total	100,0

**Main clients (E1):** 55 % of the companies have health services (hospitals, doctors, health insurance) as their main clients. 81 % also sell their products to distributors and 21 % to other manufacturers (multi-responses possible). Direct sales to patients are minor (2 %).

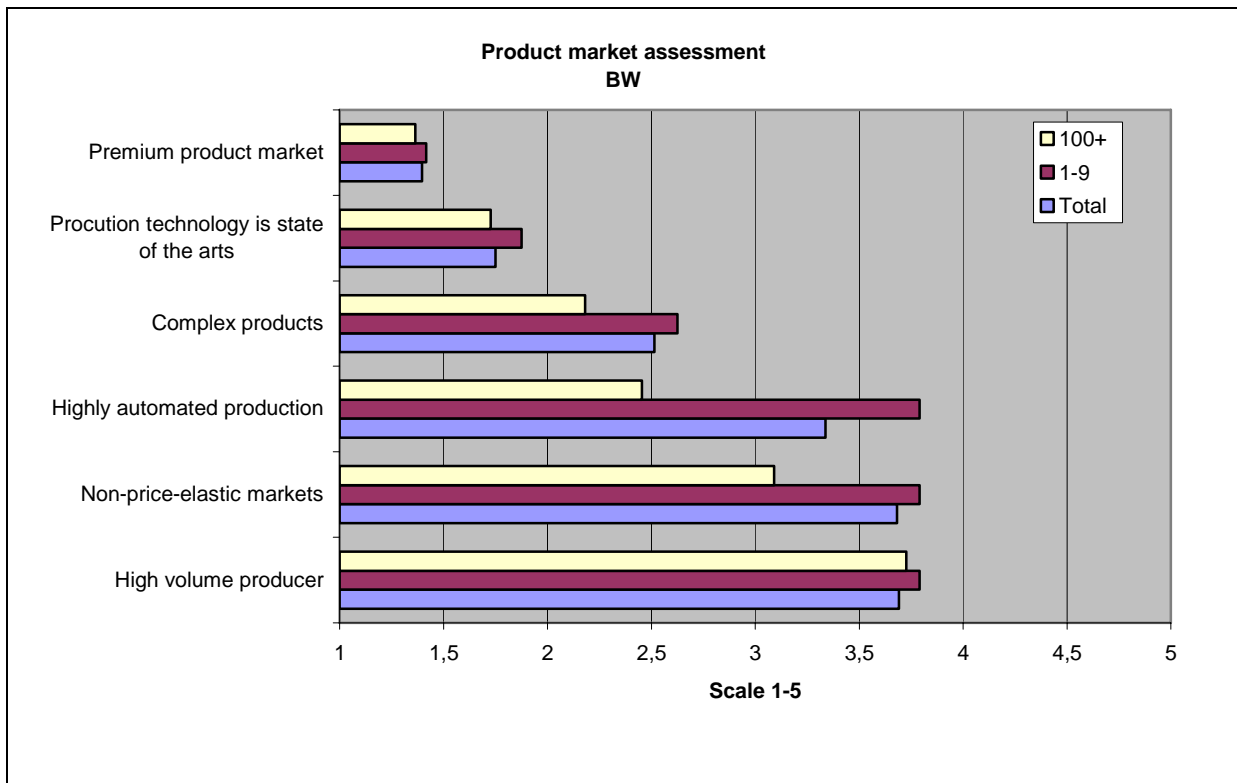
**Approval of products (E2):** In 78 % of the companies the products require the approval by a regulatory authority. In the majority of companies almost all products need an approval: in 49 % of the companies all products need an approval and in further 12 % almost all products.

**Product market assessments (E3):** Following their own assessment, companies are working on premium product markets (average level of 1.4 on the scale from 1 to 5), and Production technology is state of the arts (1.8). They produce complex products (2.5). The production volume is low (3.7 for high volume producer) and the degree of automation is assessed as medium (3.3). Product markets are price-elastic (3.7 for being non-price-elastic).

Differences between companies of different size appear mainly regarding the complexity of products, the level of automated production and price elasticity of product markets.



**Chart 3-3 Product market assessments – Baden-Württemberg**

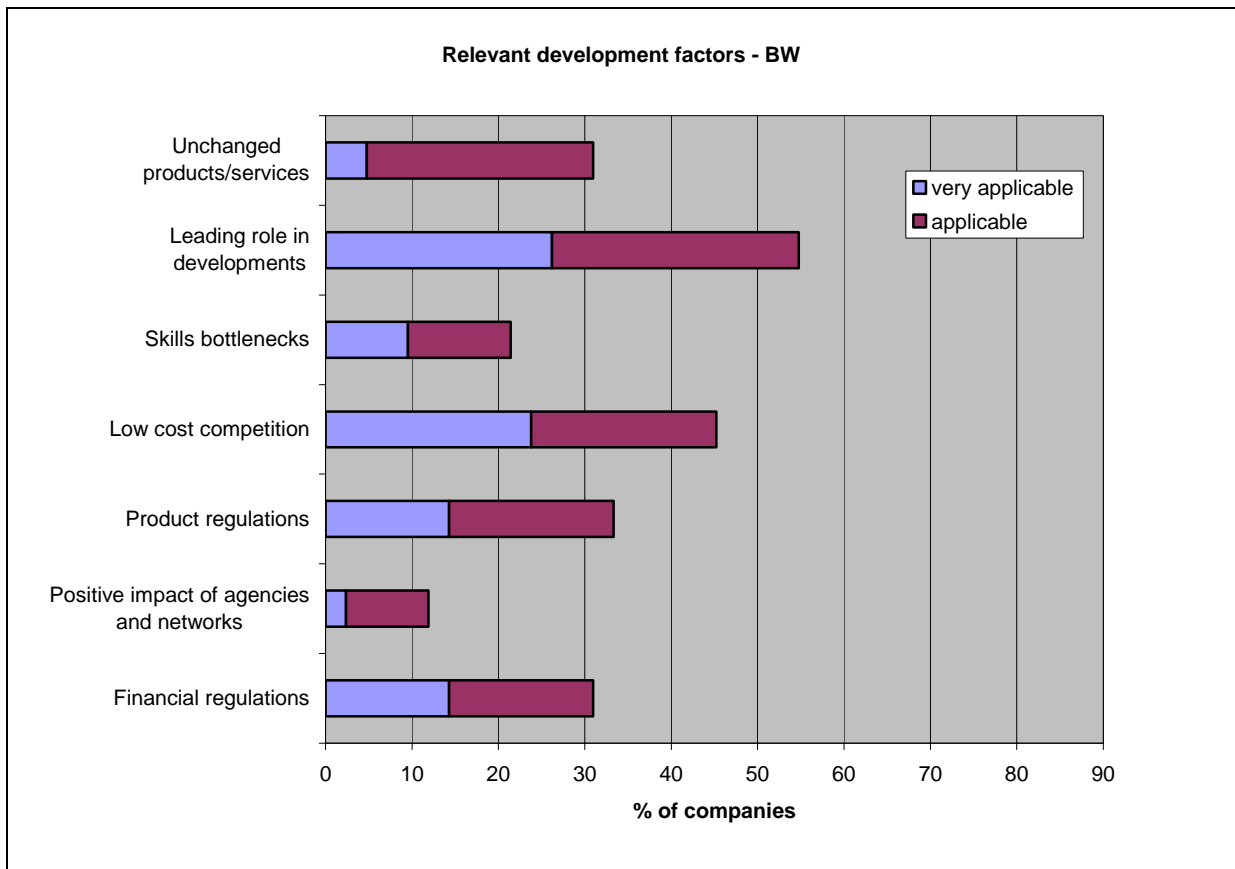


**Determinants of company development (E4):** Companies are convinced to play a leading role in technical product development (29 % say that this is applicable and 26 % say it is very applicable; Chart 3-3). For the majority of companies products and services have changed during the last years (31 % for unchanged products and services).

Financial regulations by public health care system are relevant for the development of the business for 31 %. Product regulations and approvals are important for 33 %.

Low cost competition by foreign countries is a minor factor which appears as relevant for 45 %. Skills bottlenecks are important to 21%. The impact of regional development agencies or networks is relevant only for 12 % of the companies.

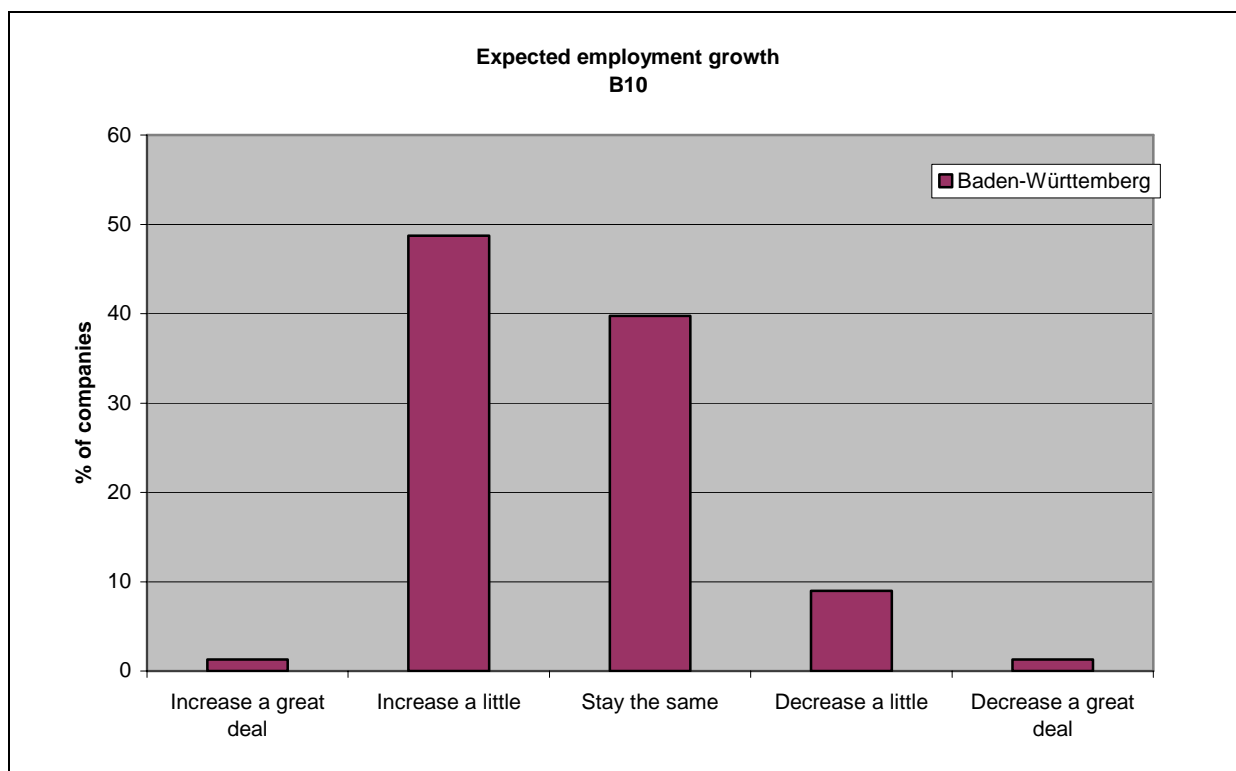
**Chart 3-4 Relevant development factors – Baden-Württemberg**



**Capacity utilisation (B11):** Production capacities in medical production are largely utilised: 51 % of the companies work at full capacity, 15 % are at overload. 33 % are below normal capacity utilisation. Smaller companies show the same picture of capacity utilisation as the average. Larger companies perform better.

**Expected employment growth (B10):** Companies are slightly optimistic about further employment growth during the next 12 months (Chart 3.5). Half of them expect a little increase of employment but only 1 % expects a strong plus. 40 % expect stagnating employment and only 8 % expect negative employment trends.

Chart 3-5 Expected employment growth – Baden-Württemberg



### 3.3. Employment

**Employment growth in medical production (B2, B3):** The average growth rate of employment in medical production was 2.4 % during the last 12 months. Companies with more than 100 workers grew significantly stronger than the average (+14 %). Employment in small companies however decreased (- 2 %).

**Fluctuation rates and reasons (B4):** About 5 % of the workforce left the medical departments of the companies during the last 12 months. In smaller companies with less than 25 workers the fluctuation rate was more than 3 times higher than in bigger companies (7 % as compared to 2 %).

**Reasons for job quits (B5):** As far as companies knew about the reasons for quits, 33 % of the workers left the company due to dismissals by the company (among multi-response reasons) and 13 % because they were made redundant. Most of them (48 %) left the companies due to other reason, which is retirement in most of the cases. For further 48 % experienced a career break of the lack of career opportunities. Only 8 % left the company due to better payment elsewhere.

**Skills structure of the workforce (B6, B7):** On average 27 % of the work force are skilled workers (i.e. apprenticed employees) while only 24 % are plant and machinery operators. 25 % are scientific staff and engineers, and 16 % are managers (8 % remaining as others). 7 % hold a degree in engineering science and less than 1 % a degree in medical science.

**Research & Development (B8, B9):** 14 % of the staff is engaged in research & development activities. Small companies have almost a double share of R&D staff (23 %). 86 % of the companies, however, do not undertake R&D, while 14 % get R&D services done at the head office.

**Recruitment during last 12 months (C1, C2):** 55 % of the companies recruited new staff during the last 12 months. Even one fourth of the companies with less than 10 workers made hiring. The average hiring rate (of companies with hiring during the last 12 months; related to total company employment) was at 5 % for all companies. In small companies it was slightly higher than in large companies.

**C3, C4 (not yet classified)**

**Hard to fill vacancies (C5):** 45 % of the companies which recruited people during the last 12 months had hard to fill vacancies, in particular small companies and companies with more than 100 employees.

**Lacking skills (C7, C8, C9):** On average, 3 items were nominated among the 16 alternatives. The answers focused on technical and foreign language skills (44 %), and on clinical and medical skills (33 %). The number of cases however is rather low (18).

**Former job of recruited workers (C11):** Most of the persons recruited during the last 12 months were coming from other medical companies (52 %), or from the other industries (46 %). The major part came from the region. A significant share was also coming from unemployment (240 %).

### 3.4. Human resource management

**Skill levels (D1):** The level of proficiency decreases with the functional position of staff members. Managers were given a level of 1.6 within the scale of 1 to 5 (Table 3.2). Professional scientists and engineers were close to that with a level of 1.6. Skilled trades occupations got 2.1 and semi-skilled workers 2.6.

There was no company which assessed their staff to be less than fully proficient at their job in any of the functional groups.

**Table 3-7 Skill levels of staff - Baden-Württemberg**

	Persons employed per company				Total
	1-9	10-24	25-99	100+	
Managers	1,5	1,8	1,5	1,6	1,6
Professional scientists and engineers	1,4	1,9	1,8	1,5	1,6
Skilled trades occupations (i.e. fully apprenticed manual employees)	2,0	2,1	2,1	2,1	2,1
Process, plant and machine operatives (i.e. semi-skilled production workers)	2,7	2,4	3,0	2,2	2,6

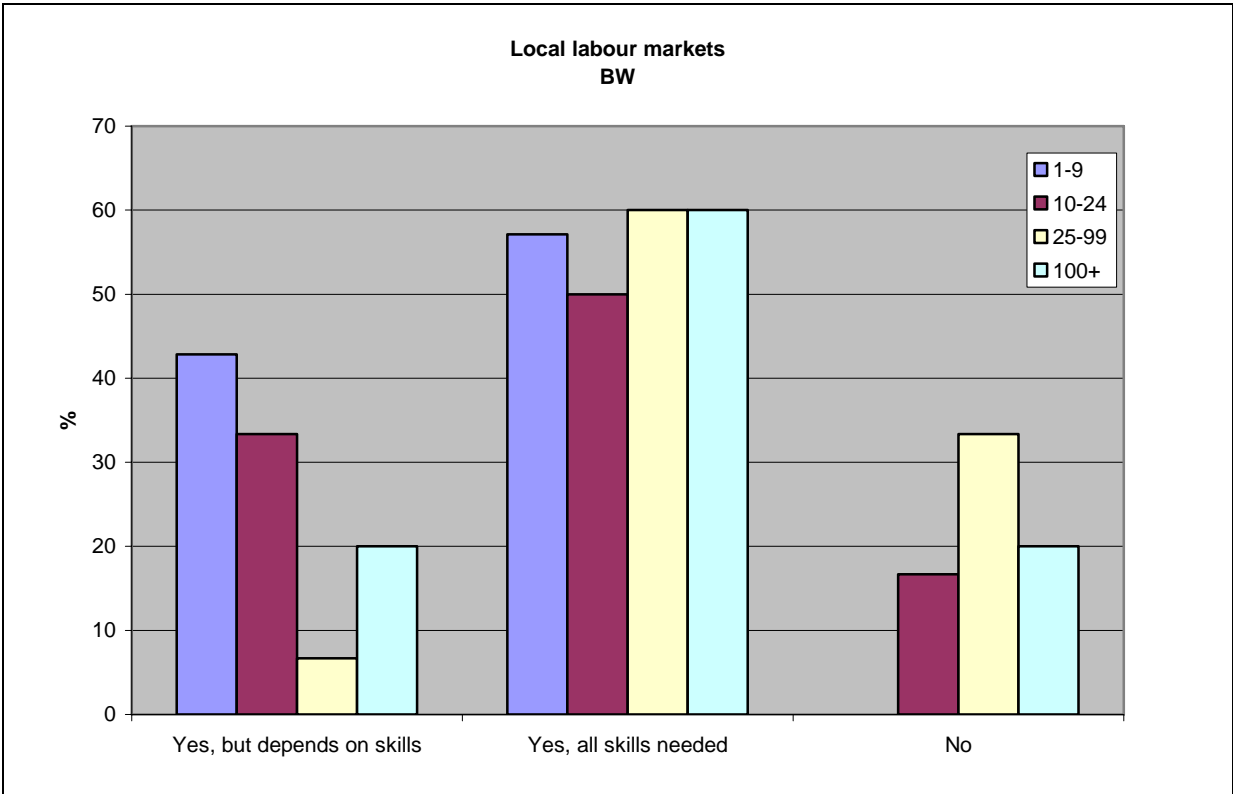
**D2-D7: not applicable.**

**Risks for future proficiency (D8):** As far as there are risks for the future proficiency of the staff this is due to a variety of reasons. Partly time and cost restrictions are important. The lack of time for training (31 %), lack of cover for training periods (23 %) and

financial restrictions (13 %) were the answers chosen. The lack of courses in the area or a general lack of courses was identified by 10 % and 7 % of the companies. The unwillingness of the staff was mentioned by 28 %. High staff turnover was not mentioned. 39 % do not see any barriers to the improvement of staff proficiency.

**Skills availability on local labour markets (D9):** Over 50 % of the companies can find all skills needed on local labour markets. Between 30 and 40 % of the smaller companies find at least parts of the skills needed depending on the specific qualification (Chart 3.6). The share of companies which do not find the skills required is 21 %. Most importantly, a greater share of smaller companies experience skill problems as compared to bigger companies.

**Chart 3-6 Skills availability on local labour markets - Baden-Württemberg**



**Preparation of staff for future challenges (D11):** 87 % of the companies assess their staff to be well prepared for future challenges on product markets, and 16 % think to be very well prepared. In 13 % of the companies staffs seem to be not so well prepared.

**Future difficulties to obtain required skills (D12):** 60 % of the companies do expect difficulties in getting the skills required. Beyond basic communication and marketing skills, technical skills and software skills will be difficult to recruit. Medical and clinical skills are not mentioned.