SHAPING THE FUTURE OF FINNISH MACHINERY, METALS, AND ELECTRONICS

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FOREWORD

SHAPING THE FUTURE OF FINNISH MACHINERY, METALS, AND ELECTRONICS

Finland's technology industry has long been the backbone of the Finnish economy, and especially of its exports. Today, the industry generates over EUR 65.1 billion in revenues (2013) and accounts for 50 percent of annual exports (EUR 24.8 billion). The machinery, metals, and electronics sectors (the focus of this paper) contribute about 80 percent of the volume.

At the same time, there are signs of change. Our survey of 150 Finnish companies vividly demonstrates the pressure from foreign competitors of improving quality and lower-priced products and services, even in the traditional strongholds of Finnish companies. The international integration of markets is increasing, which, in turn, increases volatility. The continued shift of balance towards emerging markets, the impact of digital technology on the value chain, and disruptive technologies such as additive manufacturing have the potential to change the structure of many sectors.

Yet, the findings of the survey also provide many reasons for optimism, especially for growth- and innovation-oriented companies. Our analysis of Finnish companies' success patterns shows that companies that internationalize early and invest in innovation are more profitable and grow faster. Success also begets further success – profitability increases with company size, provided the company is able to cross the "internationalization dip" in its margins, which takes place at around the EUR 100 million revenue level.

The key message from the survey is that Finnish engineers must not rest on their laurels: as in previous decades, companies can only ensure their international competitiveness if they actively shape their own business models and achieve continuous improvement. In the final part of this report, we introduce selected concrete ideas as the basis for further discussion. Depending on the respective starting situation, the approaches are naturally weighted differently and should be shaped individually. Each company is invited to adopt the relevant courses of action that are applicable to its specific case.

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BACKGROUND

CONTEXT AND OBJECTIVES OF THE STUDY

The technology industry is one of the largest sectors in the Finnish economy, having total annual revenues of EUR 65.1 billion (2013) and accounting for 50 percent of annual exports (EUR 24.8 billion). The machinery, metals, and electronics sectors (the focus of this paper), with combined revenues of EUR 51.8 billion, represent a majority (approximately 80 percent) of the technology industry volumes.[1]

The purpose of this study, conducted with The Federation of Finnish Technology Industries, the Ministry of Employment and the Economy, and McKinsey, was to identify cross-sector drivers of growth and profitability, assess the changing landscape that companies are faced with, and, building on these findings, provide concrete measures of action for future success.

The machinery, metals, and electronics sectors are facing multiple challenges. The industrial production in Finland today has not yet recovered to its 2008 levels. Exports have declined by 18 percent since these peak levels.[2] Increasing price pressure from low-cost players, uncertainty and volatility of business cycles, and domestic costs are putting pressure on margins.

Nevertheless, many of the current trends provide opportunities for growth. Although the dynamic competitive environment is changing, conditions outside the borders of Finland – and Europe – remain more favorable. Global demand for machinery is expected to have grown at a rate of 2.3 percent in 2014, and demand is increasing even faster in emerging markets. Thus, the opportunities for regaining momentum exist. But in order to do this, decisive action is required.

SAMPLE DESCRIPTION

One hundred fifty companies from the machinery, metals, and electronics sectors of the technology industries participated in the survey that provides the basis for this paper. Participants ranged from large multinational companies operating internationally to small, family-run, local players, thus, representing the full spectrum of the focus sectors (see Exhibit 1). In addition to the survey analysis, executives of small champions – defined as still small but already very successful firms – were interviewed to understand their success recipes.

A similar survey conducted in Germany was used as a comparison for key metrics, recognizing the overall differences between the two countries (see Exhibit 2). Overall, the material differences to Germany signal a more challenging starting position for the Finnish

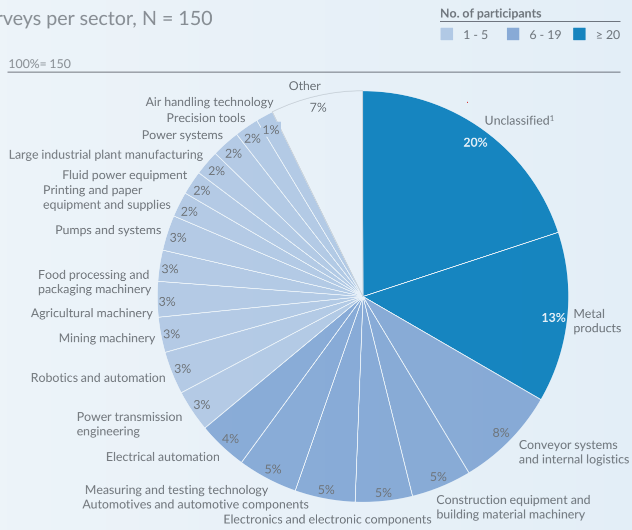
1 Tilastokooste teknologiateollisuudesta ja Suomen taloudesta, September 2014, Technology Industries
2 Ibid

A total of 150 companies participated in the survey

No. of fully completed surveys per sector, N = 150

- Average profitability (EBIT margin): 4.4%
- Average sales growth: 8.2%
- 79% of the companies in the survey sample have annual sales of less than EUR 50 million

Revenues EUR millions	No. of companies
> 1,000	10
> 300 - 1,000	7
> 100 - 300	8
> 50 - 100	7
> 10 - 50	57
≤ 10	61
Total	150



1 Including 30 participants without sector specification

Exhibit 1

machinery, metals, and electronics sectors. In comparison to Germany, the participating companies in the Finnish survey had lower profitability, growth, internationalization, and R&D spending. The German survey was also only focused on the core machinery sector, which has been taken into account in the comparisons. The profitability differential would likely have been larger if the more-profitable metals and electronics sectors had been included in the Germany survey.

A similar survey conducted in Germany was used as a comparison, displaying the overall differences between the countries

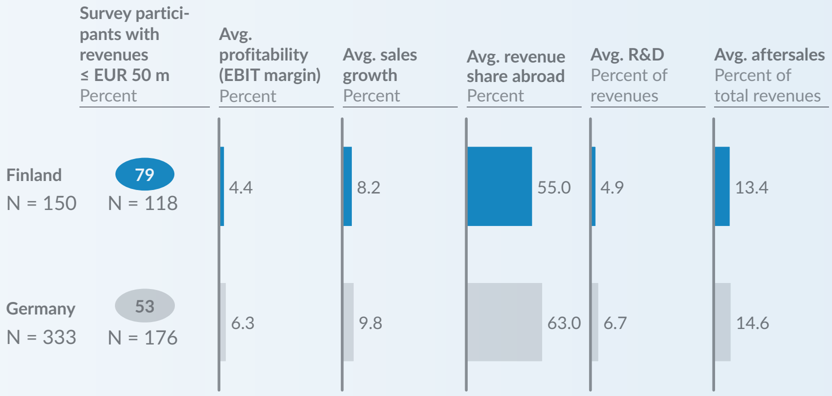
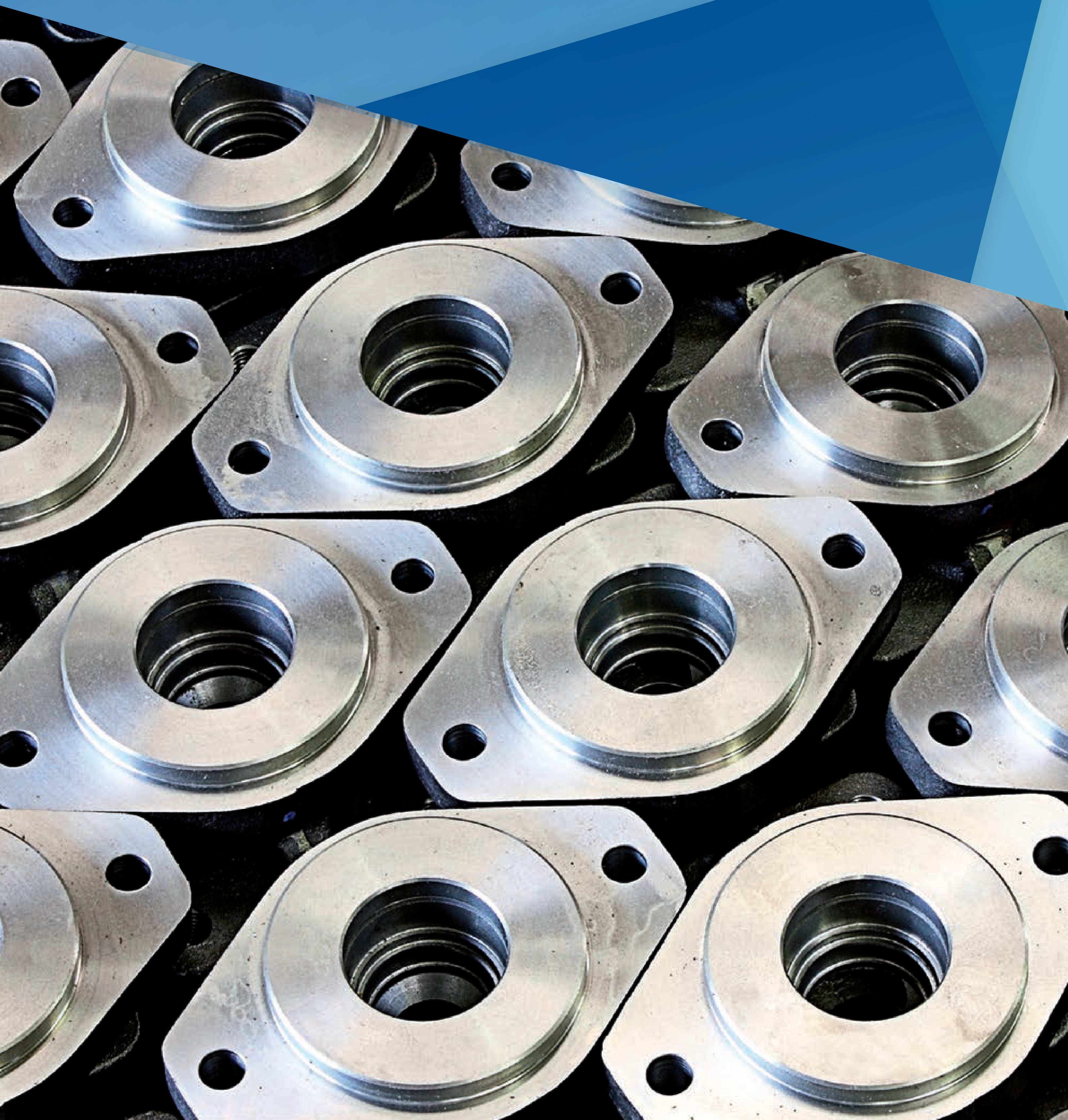


Exhibit 2

The stronger performance of the German companies could be explained by their larger size and internationalization (both of which are connected with higher profitability and/or growth). Also, it is likely that workforce flexibility, a strong industrial heritage, and the sustained sector focus on machinery in Germany contributed to the difference.

SUCCESS PATTERNS

KNOWING WHAT MATTERS FOR FINNISH COMPANIES



The survey results clearly demonstrate that there is no single recipe for success – companies of many shapes and sizes can make it to the top. Firms build growth and success in many different ways. For one, growth comes from internationalization and a focus on the premium segment and, for the other, from leveraging local demand and a solutions-oriented business.

However, the survey findings indicate that there are certain common factors for many of the more-successful players. The analysis points to nine specific success factors (see Exhibit 3) within the Finnish machinery, metals, and electronics sectors.

The study reveals 9 success patterns – some obvious, some surprising ...

✓ Positive impact ✖ Negative impact – No impact

		Impact on ...	
		Profitability	Growth
1	**Company size** provides an opportunity – but with a "dipping point." Profitability improves until net sales of EUR 100 million, then dips and starts to recover again after net sales of EUR 300 million	(✓)	Not measured
2	**Internationalization** is related to both higher profitability and growth. The small domestic market drives Finnish companies to internationalize early	✓	✓
3	**Operational excellence** champions (measured by delivery reliability and share of customer complaints) are significantly more profitable and fast growing than peers	✓	✓
4	**Core-business-focused** players are more profitable – but successful diversifiers can also be identified	✓	–
5	**Innovation** leaders are more profitable and grow faster than innovation followers	✓	✓
6	**Premium price** pays off both in terms of profitability and growth	✓	✓
7	**Solutions providers** grow faster and are as profitable as component/single-machine suppliers	–	✓
8	**Aftersales services** – high share of service business is connected with higher profitability but does not enable companies to grow faster	✓	–
9	**Management structure** determines strategy – externally managed companies are slightly more profitable, and family-run companies grow faster	✓	✓

Exhibit 3

The identified success patterns were largely in line with Germany, but with differences in the impact of price segments, solutions, and a focus on core business (see Exhibit 4).

Looking at the differences between the two countries, Finnish companies focusing on high-price segments have been able to achieve more profitability. On the other hand, German companies focusing on high-price segments are on par with others in terms of profitability. This could signal that Finnish companies operating in the premium segment have been better able to optimize product cost structure and service level.

Finnish companies focusing on solutions have achieved at-par profitability with single-machine and component producers despite higher complexity. In Germany, solutions providers had a profitability disadvantage. This difference may be explained by the differences in country sizes. In a small market like Finland, full specialization may be difficult, and moving to a solutions provision earlier on may be a natural conclusion for many companies, enabling learning.

... findings are largely in line with Germany – however, different findings exist for core business, premium price, and solutions

✓ Positive impact ✗ Negative impact
– No impact ▒ Areas of difference

		Finland		Germany	
		Profitability	Growth	Profitability	Growth
1	Company size	(✓)	Not measured	✓	–
2	Internationalization	✓	✓	✓	✓
3	Operational excellence	✓	✓	✓	✓
4	Focus on core business	✓	–	✓	✓
5	Innovation	✓	✓	✓	✓
6	Premium price	✓	✓	–	✓
7	Solutions providers	–	✓	✗	✓
8	Aftersales services	✓	–	(✓)	–
9	Management structure	✓	✓	✓	✓

SOURCE: McKinsey VDMA study, 2014: "The future of German mechanical engineering"

Exhibit 4

Interestingly, no clear link was found between diversification and growth in Finland. In the German survey, a focus on the core business enabled faster growth. A focus on the core could, on the one hand, open up international opportunities. On the other hand, being focused on the core also means saying no to potentially faster-growing opportunities elsewhere. These opposing effects seem to play out differently in Finland and Germany.

Attributes of successful companies

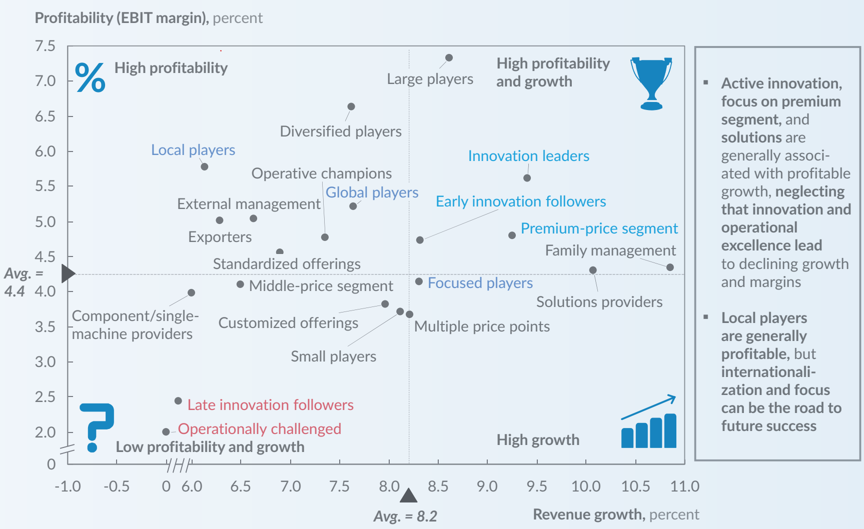


Exhibit 5

Overall, the most influential attributes of success (in terms of both profitability and growth) are size, innovation leadership, premium-price focus, family management, and solutions business (see Exhibit 5).

The nine success patterns are discussed in more detail in the sections below.

1. COMPANY SIZE PROVIDES AN OPPORTUNITY – BUT SMALL CHAMPIONS ALSO EXIST

On average, larger companies exhibit higher profitability (see Exhibit 6). Stepping up from a small company with revenues of under EUR 10 million to a medium-sized company increases the EBIT margin from 2.9 to 4.6. Profitability continues to improve thereafter until the company reaches EUR 100 million in revenues. Increasing size comes with increasingly complex operations, and then profitability declines. After this dipping point, a gradual recovery ensues, and large companies with annual revenues of over EUR 1,000 million often display profitability margins above 10 percent.[3] Given the relatively small sample in the various size brackets, the exact profitability averages should be read as illustrative – but the overall finding of gradually increasing profitability interrupted by a dip in the EUR 100 million revenue range should provide guidance.

Profitability improves with size until revenues of EUR 100 million, driven by economies of scale and professionalization – thereafter, complexity starts to eat up profitability, followed by gradual recovery

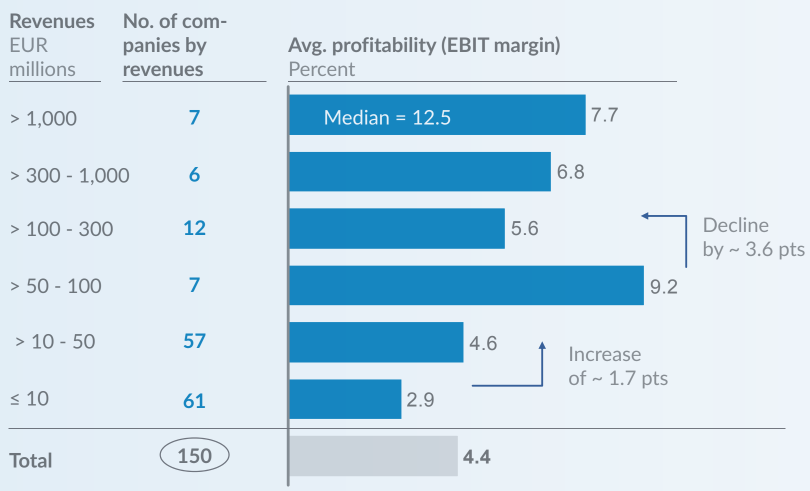


Exhibit 6

3 Important to note that the number of respondents from the following revenue categories (EUR millions) were fairly low: > 50 - 100, > 300 - 1,000, and > 1,000

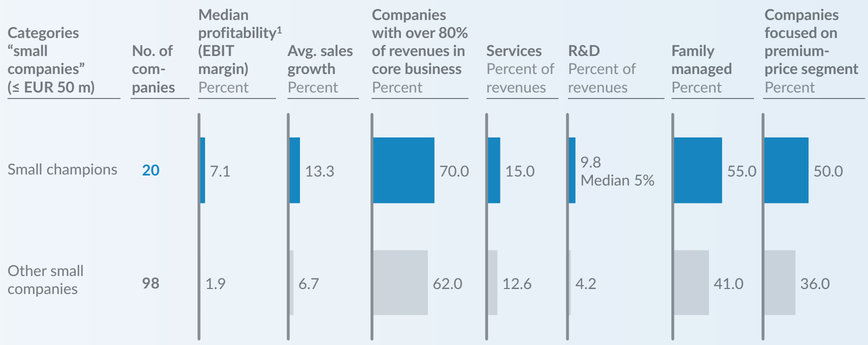
The size and profitability analysis implies that there is plenty of room to grow for companies in the machinery, metals, and electronics sectors in Finland. Most companies in these sectors are well below the EUR 100 million dipping point, with the majority (approximately 79 percent) having revenues under EUR 50 million.

However, size alone does not guarantee success for a company. Large and small companies face different challenges and opportunities. While big players can take advantage of economies of scale, small players can be more flexible and respond more quickly to changing circumstances. The majority of Finnish companies operating in these industries are small or medium sized, and approximately 79 percent of survey participants had revenues under EUR 50 million. Since small to medium-sized players account for a large part of the industry, it is important to uncover traits common to successful smaller companies.

A group of small champions, consistently displaying higher-than-average growth and profitability, was identified from the survey respondents.

Once again, there is no given formula for small champions – the companies range from local players to internationalized solutions providers. Small champions are also located across many industries and exist within sectors that generally display lower profitability and growth. Industry affiliation does not guarantee or prevent success. However, some higher-than-average metrics in certain categories are common to the small champions (see Exhibit 7).

A group of top-performing small champions can be identified with common defining characteristics



1 Actual financial data was used for a select group of respondents for calculating the EBIT margin (N = 99)

Exhibit 7

Small champions' profitability as measured by the median is 7.1 percent, while it is 1.9 percent for their peers.[4] They also grow at 13.3 percent on average, while their peers grow at 6.7 percent. Small champions are more focused,[5] with 70.0 percent of respondents receiving the majority of their revenues from their core businesses. Many cited 100 percent focus. The proportion of focused businesses among peers is 62.0 percent.

Services make up, on average, 15.0 percent of the revenue for small champions, while, for their peers, the same figure is 12.6 percent. They also typically invest more in R&D: the median investment was 5.0 percent,[6] as opposed to an average of 4.2 percent for their peers.

Fifty-five percent of the companies are family managed, which is 14.0 percentage points more than for the peer group. Furthermore, 50.0 percent of small champions focus on the premium-price segment as opposed to only 36.0 percent of other small and medium-sized companies.

In order to gain a richer understanding of the drivers behind success, five interviews were also organized with small champions (see Exhibit 8).

A group of top-performing small champions can be identified with common defining characteristics – insights from interviews

Core business	"We have thrived through our focus on a small-enough global niche segment. We have concentrated all our resources on it" *CEO of a communications technology company*	"Focusing our efforts on becoming the world leader in our core business has been critical to our success" *CEO of a component manufacturer*
Services	"We have maintained our edge over Asian competitors due to our value-adding services. We will increase our focus on services in the future" *CEO of a power transmission technology company*	
R&D	"R&D has been at the heart of our success. We do most of our R&D in close cooperation with our customers – but protecting modularity to the furthest extent possible" *CEO of a lighting solutions company*	"Being R&D leader (either 1st or a fast 2nd to the market) has been critical for us. We leverage external partners heavily" *CEO of a communications technology company*
Family managed	"I consider family management important for us. It has helped us maintain our focus on long-term value creation. We have also maintained cost discipline" *CEO of a lighting solutions company*	"Family management has enabled us to make quicker decisions and build commitment throughout the organization" *CEO of a power transmission technology company*
Higher prices	"We made a decision a long time ago to only go after customers who are willing to pay for premium quality" *CEO of a communications technology company*	"As a Finnish company, focus on higher price points was natural; we cannot be competitive in bulk segments" *CEO of a lighting solutions company*

Exhibit 8

All interviewed firms mentioned a focus on core business as a critical success factor. A focus specifically on the small-enough, yet still material, global niche was considered important for enabling regional or global leadership, even for small companies.

4 For assessing profitability, actual EBIT margins and average revenue growth figures from financial statements were used (N = 99)
5 Focus is determined by receiving over 80 percent of annual revenues from the core business
6 Group average was 9.8 percent due to some data outliers with large investments in R&D

Services were mentioned as a differentiating factor compared to lower-cost players and will become more important in the future.

All interviewees also mentioned R&D leadership as a critical enabler. Joint R&D efforts with customers and external partners were already considered important and will continue to gain importance in the future. Modularity was considered to be an important, yet unrealized, lever for improving R&D effectiveness in the future.

Family management was also mentioned as being beneficial: enabling a longer-term focus, cost discipline, and decisiveness as well as driving commitment in the organization.

Interviewees also mentioned that a focus on higher price points is important. This is often a natural choice, as Finnish companies often have difficulties competing in bulk segments.

A similar analysis was conducted in the VDMA survey in Germany (study on the German mechanical engineering industry). However, in the study, small champions were selected according to predetermined success criteria, while in Finland, small champions were nominated purely based on high growth and profitability.

2. INTERNATIONALIZATION IS RELATED TO BOTH HIGHER PROFITABILITY AND GROWTH – THE SMALL DOMESTIC MARKET DRIVES FINNISH COMPANIES TO INTERNATIONALIZE EARLY

Internationalization is profitable – a higher share of international revenue typically goes hand in hand with higher profitability (see Exhibit 9). On average, there is an EBIT difference of 2.1 percentage points between companies receiving over 80 percent of their revenues

More-internationalized players are also more profitable

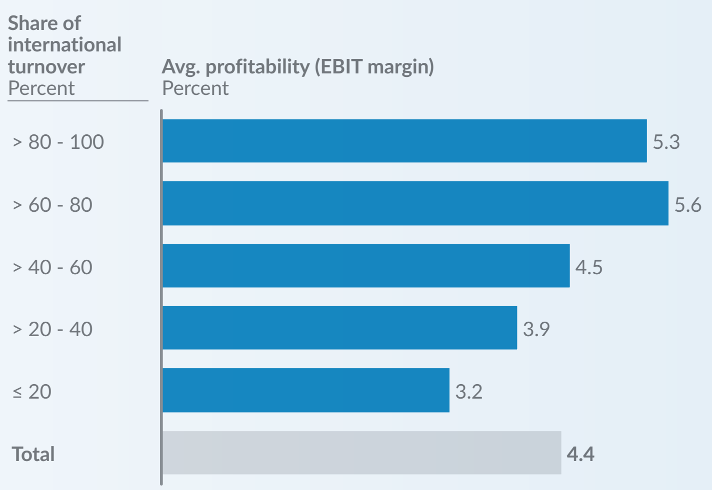


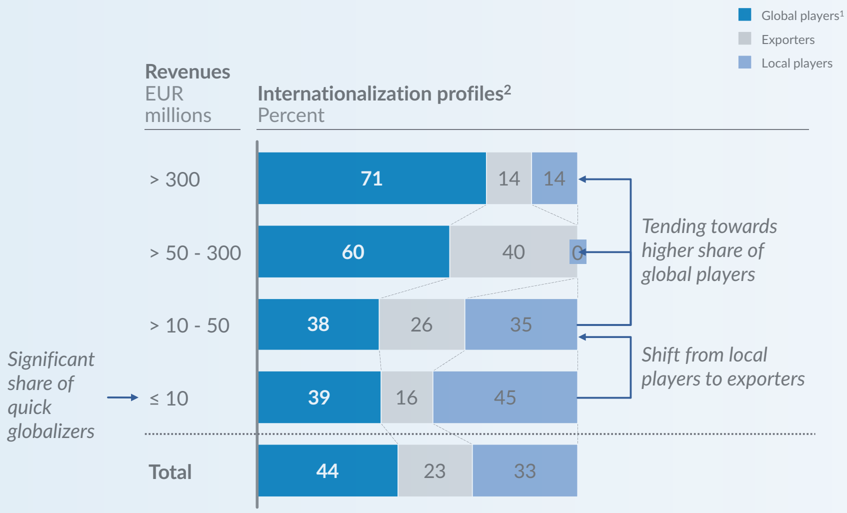
Exhibit 9

from abroad as opposed to receiving these percentages locally.[7] Internationalization is also one of the key drivers of growth, driving expansion significantly more than diversification outside the core business.

The connection between internationalization and profitability is not a surprise considering Finland's small domestic market and stronger growth, especially in emerging markets, which will contribute to 75 percent of global GDP growth through 2025.[8]

Many Finnish companies internationalize rapidly due to the smaller size of the domestic market, and there is a large share of quick globalizers (see Exhibit 10). When making the jump from a small to a medium-sized company, more local players turn into exporters. As a company's size grows, a larger proportion of companies become global players (having production, assembly, and/or R&D abroad).

Rapid internationalization from local players via exporters to global players – large share of quick globalizers



1 Global player defined as a company with production, assembly and/or R&D abroad
2 In some revenue categories the percentage total does not add up to 100 due to rounding

Exhibit 10

The effect of internationalization is similar for both small and large companies – internationalization pays off (see Exhibit 11). For small players, profitability increases steadily until 60 to 80 percent of revenues come from abroad. The difference in profitability between companies in this category and most of the local players is 2.5 percentage points. This effect is even more pronounced for large players, and the majority of large companies are internationally oriented. Typically, larger companies have a higher proportion of international revenue.

7 A local player is defined as a company earning 20 percent or less of its revenue share abroad
8 McKinsey Global Institute

Profitability effect of internationalization is similar for large and small companies, but almost 40% of small companies still operate locally

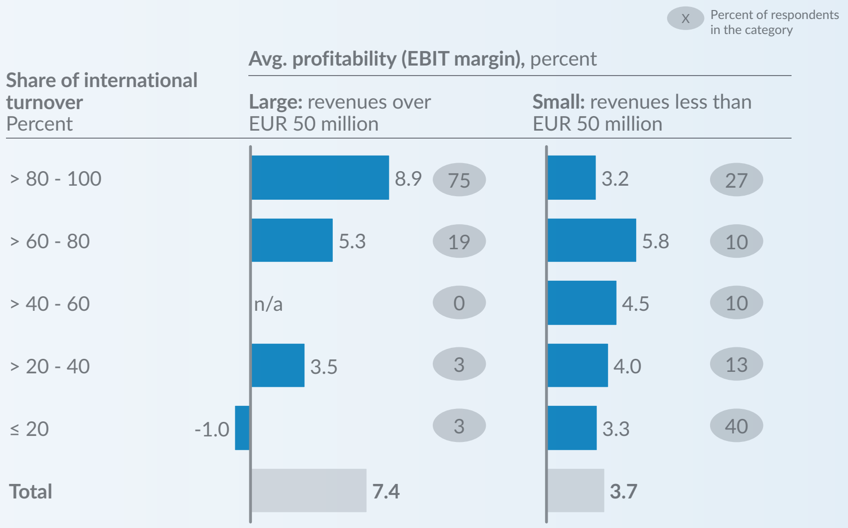


Exhibit 11

However, 40 percent of small and medium-sized companies still operate locally, with 20 percent or less of their revenues coming from abroad. This is a challenge for their growth as the domestic market is small, and demand for machinery, electronics, and metals is increasing outside the European borders. This shift of demand outside Europe was acknowledged by respondents. Many viewed it as a risk rather than an opportunity, even though a higher level of internationalization is associated with both profitability and growth.

3. OPERATIONAL EXCELLENCE IS INDISPENSABLE FOR SUCCESSFUL COMPANIES

Operational excellence is a key prerequisite for profitability and growth. Top performers, as measured by operational KPIs, achieved an average EBIT margin of 4.8 percent and revenue growth of 7.4 percent (see Exhibit 12). Correspondingly, operationally challenged peers reported average profitability of 2.0 percent and growth near 0 percent.

In the survey, performance was measured by delivery reliability and the average number of customer complaints as reported by survey participants, which were seen as indicators of product and process quality. Companies that received a best-practice merit in both categories were clustered as “operational champions.”

In the solutions business, operational excellence has an even stronger effect on growth, with 9 percent annual growth for champions. This is not a surprise as the solutions business typically increases complexity, thus, putting more emphasis on operational excellence. Neglecting operational excellence leads to declining growth and margins. Although there were not many operationally challenged respondents, the message is clear: having significant problems in this area strongly reflects in the overall health and performance of the company.

Operational excellence is critical for both profitability and growth

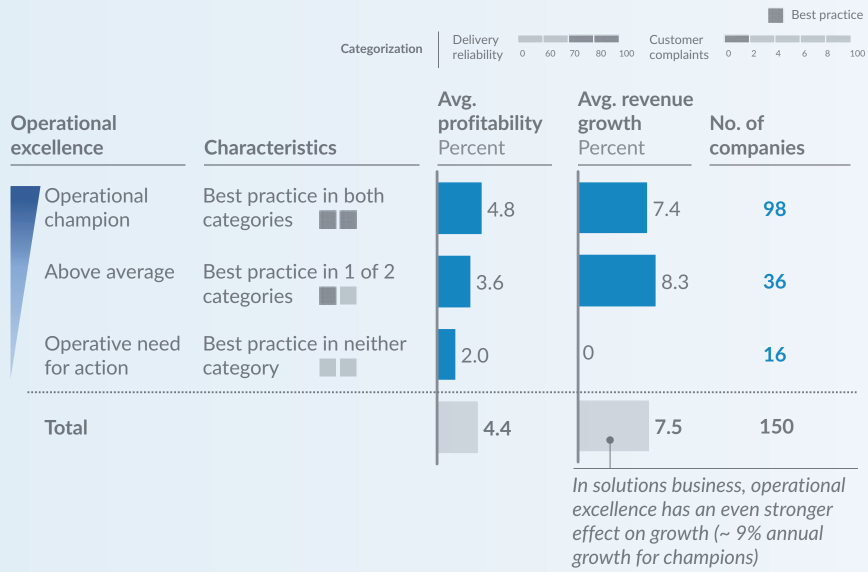
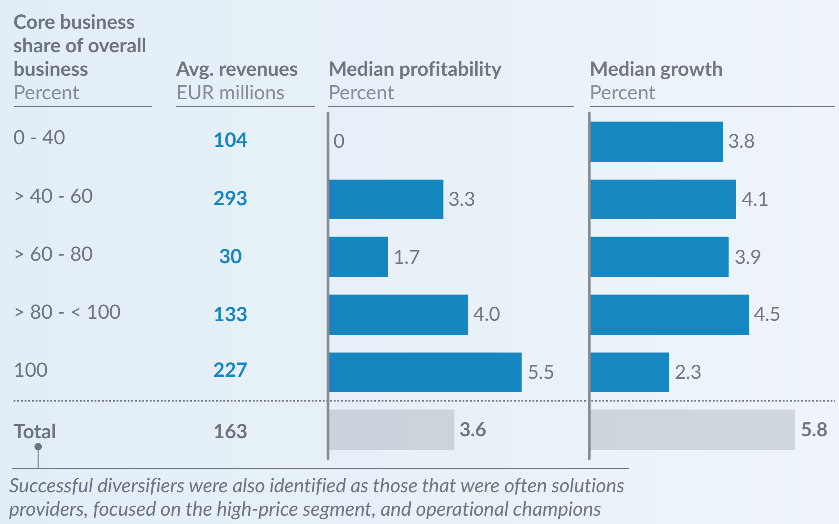


Exhibit 12

4. DIVERSIFICATION: FOCUSED PLAYERS ARE MORE PROFITABLE – BUT SUCCESSFUL DIVERSIFIERS CAN ALSO BE IDENTIFIED

Focus on the core business pays off in terms of profitability but does not have a clear impact on growth for our Finnish respondents (see Exhibit 13).

Focused players are more profitable, but successful diversifiers can also be identified



Note: Profitability and growth figures manually corrected to match reported financials for selected companies. Median used as significant outliers exist

Exhibit 13

Fully focused (100 percent of revenue from the core) players achieved a median profitability of 5.5 percent, whereas highly diversified (0 to 40.0 percent of revenue from the core) players had a 0 percent margin.

Focusing on the core allows firms to refine and improve the related structures and processes, regardless of the business model. It is also generally easier to develop technologies and realize benefits from modularization and standardization. Hence, it was not a surprise that being focused results in higher profitability. In terms of growth, a focus on the core could, on the one hand, open up international opportunities. However, on the other hand, being focused on the core also means saying no to potentially faster growing opportunities elsewhere. These opposing effects might explain the lack of a clear relationship between growth and being focused.

Higher profitability for focused players was also found in the Germany survey – a profitability advantage of 1.0 to 2.0 percentage points. However, in the German survey, focused players were also able to grow faster (2.5 percentage points higher in growth). The difference might be explained by the size of the domestic market. In a large domestic market, there is typically more room to grow with a focused model.

Being focused is not the absolute recipe for profitability. Also, a small group of successful diversifiers was identified; these diversifiers were often focused on high-priced solutions and were operational champions. A solutions-based focus as a common denominator signals that synergistic diversification pays off better than venturing into totally unrelated fields.

5. INNOVATION LEADERS ARE MORE PROFITABLE AND GROW FASTER THAN LATE-FOLLOWING PEERS

Innovation leadership pays off. Leaders are typically 3.2 percentage points more profitable than late followers (see Exhibit 14). The advantage is smaller between leaders and early followers at 0.9 percentage points, but still tangible. Innovation leadership also goes hand in hand with faster growth.

This finding supports the view that innovation allows for clear market positioning and enables companies to charge premium prices for their products. Against this backdrop, the higher-than-average investment in R&D for small champions clearly pays off in terms of higher growth and higher margins. This would also partly explain why they generally target the premium segment.

The sample of companies in our survey demonstrates that innovation can come in many forms, not only through product development (new customers, premium prices, and product differentiation) but also through applications and processes (cost reductions, more flexible inventories, and shorter response times). The key message derived from the responses is not to fall behind in technological change, innovation, and product and process development in the continuously shifting competitive environment. Companies who neglect innovation typically exhibit lower-than-average margins and low growth.

Innovation leaders are more profitable and grow faster than innovation followers

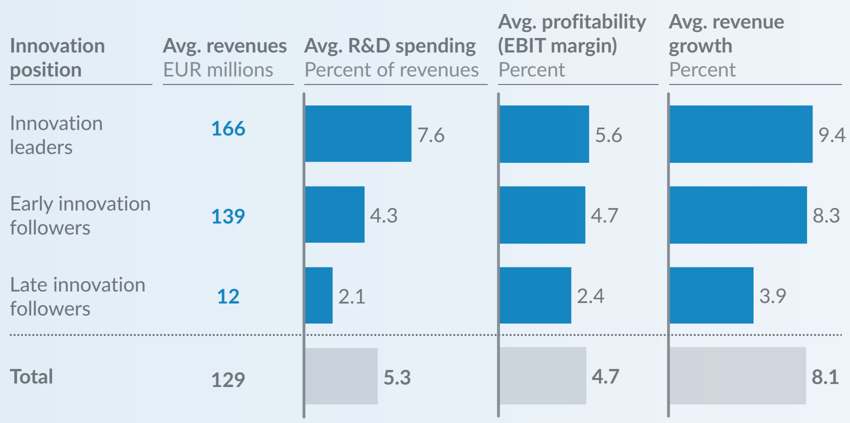
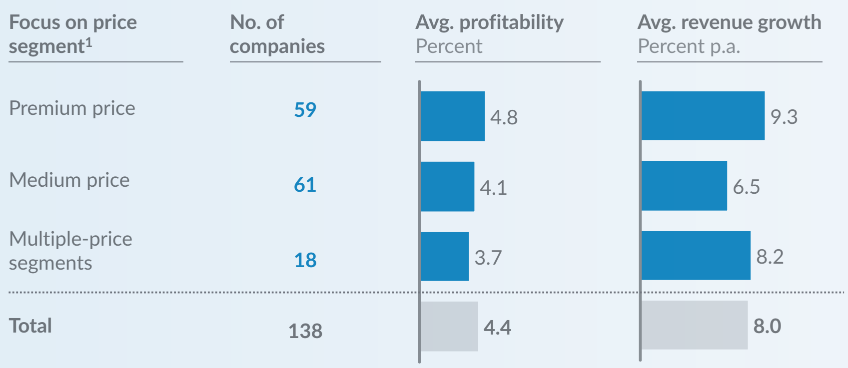


Exhibit 14

6. FOCUSING ON THE PREMIUM-PRICE SEGMENT PAYS OFF BOTH IN TERMS OF PROFITABILITY AND GROWTH

Companies that focus their products in the premium-price segment display higher-than-average profitability (see Exhibit 15). On average, profitability is 0.7 percentage points

Focus on premium-price segments pays off in both profitability and growth



1 Focus on low price excluded as a category due to low number of respondents (6), making results unreliable

Exhibit 15

higher for players who focus on the premium-price segment than for the medium-price segment, and 1.1 percentage points higher than for the ones targeting multiple-price segments. Furthermore, firms targeting the upper-price segment exhibit higher growth than those targeting both the medium-price and multiple-price segments.

Eighty-seven percent of survey respondents regard themselves as companies offering either purely premium-price or medium-price products, while only 13 percent target multiple-price segments. Fifty percent of small champions focus on the premium-price segment, as opposed to 36 percent of their peers. The self-identified low-price segment was excluded from this analysis due to the low number of respondents, making the results unreliable.

The impact of the price segment is not straightforward and depends on the geographical target market (see Exhibit 16). Companies with a significant share of Finnish business actually benefit from focusing on the medium-price segment. Conversely, for international players, providing premium-price products gives a clear profitability advantage with a 1.7 percentage point difference.

However, companies with a significant share of Finnish business actually benefit from a medium-price position

EBIT margin, percent

Focus on price segment	Share of revenues from abroad ≤ 40	> 40 - 80	> 80	Average
Premium-price segment	3.3	5.3	6.0	4.8
Medium-price segment	4.1	3.8	4.3	4.1
	Finnish market		International markets	
Average	3.8	4.7	5.1	

Exhibit 16

7. SOLUTIONS PROVIDERS GROW FASTER AND ARE AS PROFITABLE AS SINGLE-MACHINE AND COMPONENT SUPPLIERS

Single machines and components are elements of larger machines and systems, while end-to-end solutions provide entire systems that are usually customized according to individual customer needs. On average, providers of end-to-end solutions are equally profitable with a difference of only 0.3 percentage points in EBIT margins but grow significantly faster than single-machine or component providers (see Exhibit 17). The difference was rather large, with solutions providers reporting growth rates of 10.1 percent p.a., as opposed to 6.0 percent for component and single-machine providers.

On average, end-to-end solutions providers grow more strongly and are as profitable as component suppliers

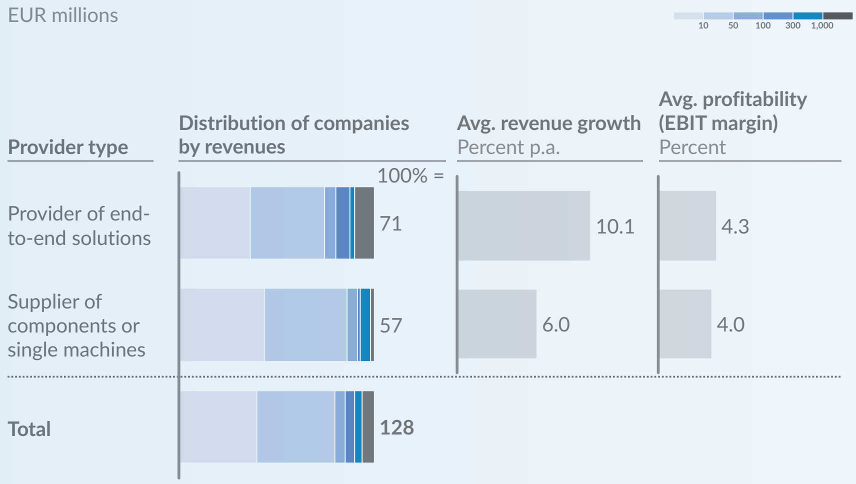


Exhibit 17

Of the survey respondents, 47 percent indicated that they offer solutions-based products, 38 percent are manufacturers of single machines or components, and 14 percent mainly provide services.[9] The distribution of provider types based on the size of the company was approximately the same, with a slightly higher proportion of larger companies being solutions providers. Within the small champions group, 55 percent are single-machine or component providers as opposed to 36 percent of their peers.

These findings contradict the results of the German study, which indicated that solutions providers grew faster but were slightly less profitable. The hypothesis provided by the VDMA study is that increased standardization and focus enable companies to profit from economies of scale and efficiency benefits. It is easier for component manufacturers to achieve a high level of standardization, providing cost reductions through more efficient production. Yet in Germany, solutions providers also grew faster, indicating that there are increasing growth opportunities in providing end-to-end solutions for customers. This growth mostly came from the rapidly increasing demand for high-quality, customized system solutions, particularly in emerging markets.[10]

9 The percent total does not add up to 100 due to rounding
10 VDMA and McKinsey: The future of German mechanical engineering

8. A HIGH SHARE OF AFTERSALES SERVICES IS LINKED TO HIGHER PROFITABILITY

A high share of aftersales and related services is linked to higher profitability. The average share of aftersales was 13.4 percent of revenues for participating companies. The difference between having over 30.0 percent of revenues from aftersales services as opposed to having 10.0 percent or less increased margins by 1.4 percentage points (see Exhibit 18). This contradicts the somewhat surprising findings of the German study, which indicated that aftersales were not linked to higher profitability. The high share of aftersales was not linked to higher growth in either of the countries. The lack of a clear link to growth signals that there are still challenges to resolve, e.g., response times, employee expertise, and, in general, extending the service offering beyond spare parts.

A higher share of aftersales services translates into higher profitability but does not lead to additional growth

Aftersales services share Percent of revenues	**No. of companies**	**Avg. revenues** EUR millions	**Avg. profitability[1] (EBIT margin)** Percent	**Avg. revenue growth** Percent p.a. 2010 - 12
> 30	33	317	5.6	8.1
> 20 - 30	12	335	3.1	8.6
> 10 - 20	22	197	4.4	5.9
≤ 10	83	58	4.2	8.4
Total	150	144	4.4	8.2

1 Total company profitability

Exhibit 18

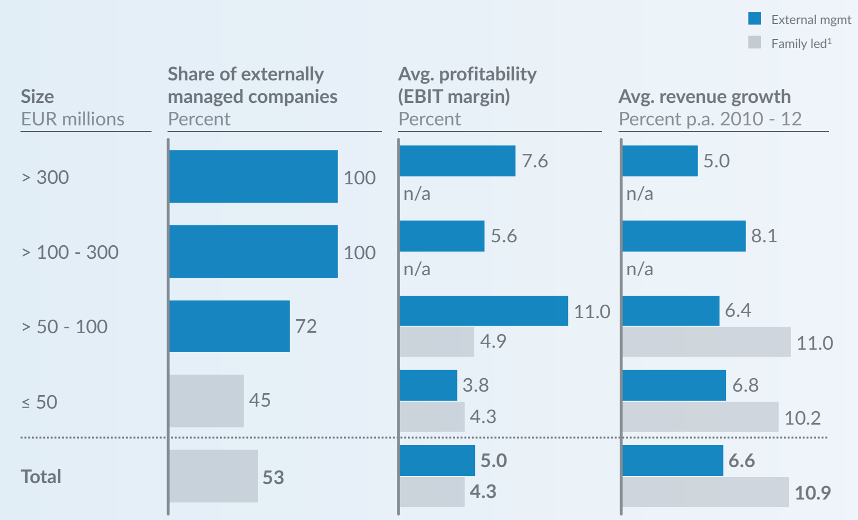
In Finland, solutions providers had a higher share of aftersales services of total revenue, whereas, in Germany, there were no major differences between the provider types. Company size was not clearly linked to the revenue share of aftersales.

There are future opportunities for expansion in this area; the German VDMA study indicated untapped potential, e.g., by providing trainings and consultations, using acquired customer data for the improvement of service offerings, and, in general, going beyond spare parts in the service business.

9. MANAGEMENT STRUCTURE DETERMINES STRATEGY – EXTERNALLY MANAGED COMPANIES ARE SLIGHTLY MORE PROFITABLE, WHILE FAMILY-MANAGED COMPANIES GROW FASTER

The findings of our survey challenge the traditional notion of family businesses as risk-averse enterprises that do not prioritize growth. Among the respondents, family-managed companies focus on growth, with a 4.3 percentage point difference to externally managed companies (see Exhibit 19). Externally managed companies display slightly higher profitability (0.7 percentage points on average).

Family-managed companies focus more on growth than profitability compared to companies that employ external managers



1 Combination of founder-led and successor-led companies

Exhibit 19

These findings indicate that external managers are more focused on immediate results and prioritize short-term profitability over sustainable growth. Family-run companies prefer to emphasize expansion and future growth.

As expected, the small companies among the respondents are often family run, while companies with revenues above EUR 100 million are all under external management.

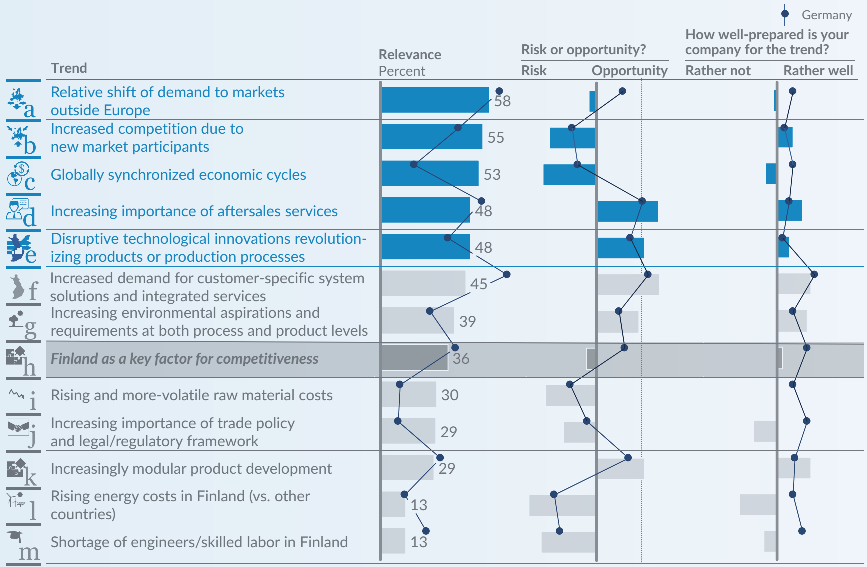
INDUSTRY TRENDS

THE DEMAND SHIFT AND DYNAMIC CHANGE OF COMPETITIVE CONDITIONS

The aim of this section is to identify and analyze the most prominent current trends. Survey participants were asked to rate the most relevant trends for their companies, indicate whether the trend is perceived as an opportunity or risk, and evaluate how well-prepared they feel to address this particular change.

Findings (see Exhibit 20) were also contrasted with the results from the German VDMA study in order to pinpoint the differences in trends and perceptions between the two countries.

The relative shift of demand to markets outside Europe and increased competition are the 2 top trends in Finland



SOURCE: McKinsey VDMA study, 2014: "The future of German mechanical engineering"

Exhibit 20

The shift of demand into markets outside Europe was seen as the foremost trend, with 58 percent of participants ranking it as relevant. Even though internationalization is linked with both higher profitability and faster growth, Finnish companies view this demand shift more as a threat than an opportunity. Furthermore, Finnish companies do not rate themselves as well-prepared for the change. The contrast to Germany here is large, where companies consider the demand shift as an opportunity they are well-positioned to capture.

Increased competition with 55 percent relevance followed closely behind, with companies generally being prepared for it, despite it being seen as a risk. Globally synchronized economic cycles at 53 percent relevance were also considered a threat, and, generally, companies do not feel well-prepared for them.

However, both technological change (48 percent) and the increased importance of aftersales (48 percent) were perceived as future opportunities; respondents are more optimistic and prepared to embrace these trends. Opportunities were also seen in the increased demand for customization and integrated services (45 percent) and increasing environmental aspirations (39 percent), of which the former was ranked as the top trend in the German survey.

Finland as a key factor for competitiveness was only rated to be the eighth most relevant trend, but here the results differ significantly from the German survey responses. While Germans view being in Germany as one of their key competitive factors and rank it as one of the top trends, for Finnish companies considering operating in Finland, it is seen as slightly risky.

A shortage of labor, rising energy costs, the importance of legal frameworks, and raw material cost hikes were also seen as risks, but survey respondents did not typically rank them as particularly relevant.

Overall, there was a variation in the perceived level of preparation depending on the trend in question, while, in Germany, companies felt relatively well-prepared to face most of the current trends.

Both optimism and concern were expressed in the survey responses. Companies were generally less optimistic about external trends, such as the synchronization of economic cycles, increased competition, and raw material costs, and felt less prepared for them, while internal trends, such as the importance of aftersales and increased demand for customized solutions, were generally seen as opportunities. Thus, while companies do not always feel confident about certain exogenous aspects of the changing competitive environment, they nevertheless have a strong trust in their ability to control internal factors such as product development and, therefore, positively tap into shifting customer preferences.

Five of the most important trends (in addition to "Finland as a key factor for competitiveness") were analyzed in more detail to understand their possible effects on profitability and the growth of the industry.

Key findings

- The shift of demand is seen as a risk for future prospects in Finland, while, in Germany, this is perceived to be an opportunity.
- Increased competition and globally synchronized economic cycles are also perceived as threats.
- The increasing importance of aftersales and new technological innovations provide opportunities for Finnish companies, as does the increased demand for customized solutions and integrated services.
- Being based in Finland as a key factor for competitiveness is seen as a risk rather than an opportunity, whereas Germany as a location for business is considered an opportunity in the German survey.

A. RELATIVE SHIFT OF DEMAND TO MARKETS OUTSIDE EUROPE

The shift of demand outside Europe was cited as the most relevant trend and was perceived to be slightly more of a threat than an opportunity. In Germany, the shift of demand was ranked second in terms of relevance. Contrary to the Finnish sentiment, German companies were optimistic and rather well-prepared for the change.

In order to respond to the change, 64 percent of those companies who selected “shift of demand” as a key trend intend to increase the export of products produced domestically (see Exhibit 21). Thirty-seven percent plan to shift production abroad. In terms of internationalizing the value chain, 34 percent[11] cite moving production, 26 percent moving purchasing, and 25 percent moving marketing and sales abroad. Conversely, human resources and R&D are not being moved out of Finland.

Companies aim to increase exports and shift production, purchasing, and target marketing efforts abroad to respond to the shift in demand

Percent of companies with prioritized trend “a”

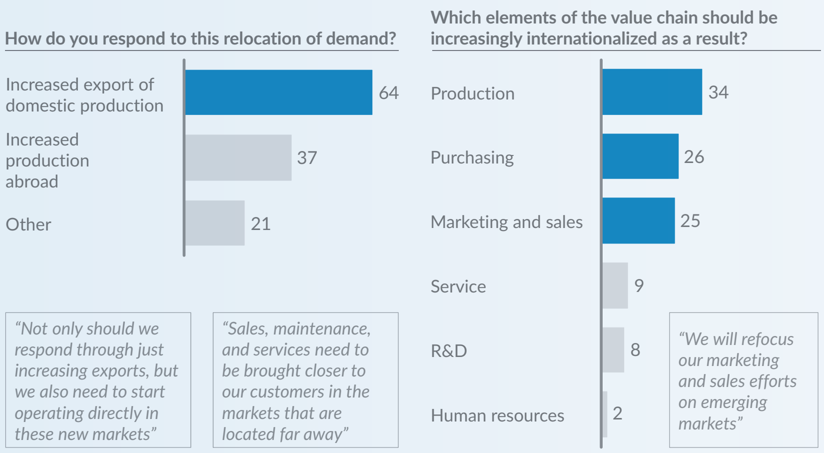


Exhibit 21

In the quotes section, many companies cited the need to not only increase exports but also to shift some of the operations such as marketing and sales directly into the new markets. IPR protection limits the companies’ eagerness to move R&D abroad.

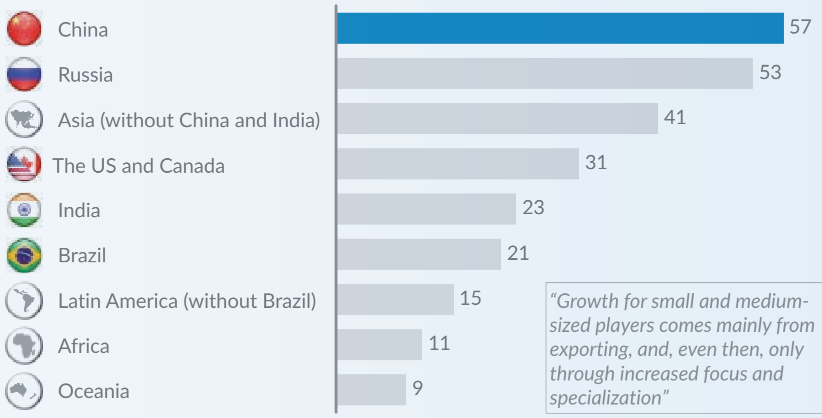
China is the most important emerging market (see Exhibit 22), with 57 percent of respondents ranking it as relevant, followed closely by Russia at 53 percent. The third most important market is Asia excluding China and India, with 41 percent relevance.

11 Slight discrepancy with previous question on “37 percent responding by relocating production abroad” due to inconsistent survey responses and blank answers

China is the most important player in terms of relocating demand outside Europe, followed closely by Russia ...

Percent of companies that prioritized this trend

Which markets are the most important for you in the relocation of demand?



"Growth for small and medium-sized players comes mainly from exporting, and, even then, only through increased focus and specialization"

Exhibit 22

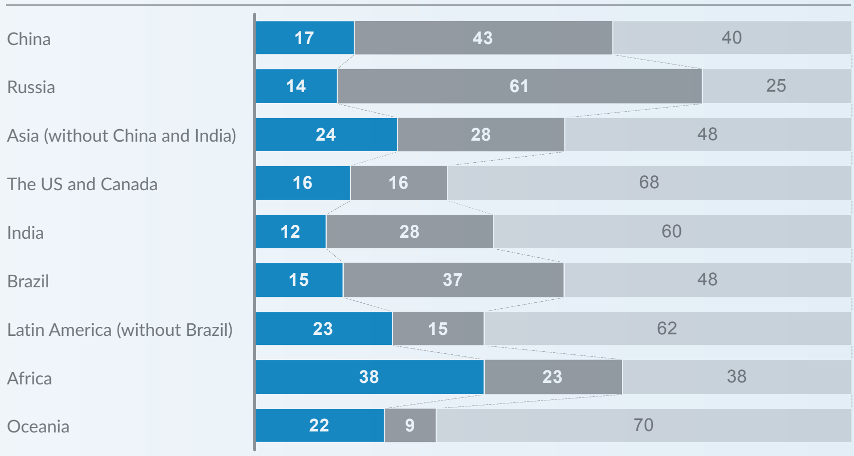
Access to some key markets is expected to become more challenging (see Exhibit 23)[12] in the future, with 43 percent responding that access to China and 61 percent that access to Russia will become increasingly difficult. This result emerged despite the fact that the survey was conducted prior to the escalation of the crisis in Ukraine.

... and access to China and Russia is expected to become more challenging in the future

Percent of respondents

In terms of government regulations and restrictions, how do you think the ease of access to the markets will change in the future?[1]

Access will become easier
Access will become more difficult
No change in outlook



1 In some categories the percentage total does not add up to 100 due to rounding

Exhibit 23

12 Note: Respondents to the market access question were not always the same as those for the survey questions on shifting demand

This increasing difficulty of access combined with Russia and China being key markets in terms of shifting demand can potentially be challenging. However, there are also opportunities; Asia without China and India is also a significant market for many segments, and the ease of access in that area is expected to stay the same or even improve.

It could be beneficial for companies to start searching for opportunities in "less traditional" emerging markets such as in Southeast Asia, e.g., in countries like Indonesia, Vietnam, and Thailand. These markets are already sizable and fast growing. For example, the ASEAN countries[13] together already represent a combined GDP of USD 2.4 trillion. If ASEAN were a single country, it would already be the seventh-largest economy in the world, and by 2050 the fourth-largest economy.[14]

B. INCREASED COMPETITION DUE TO NEW MARKET PARTICIPANTS

Increased competition from new market participants was cited as the second most important trend, and it was perceived as a major risk.

Falling prices combined with high domestic production costs are the largest challenges – M&S, cost cutting, and services are the key responses

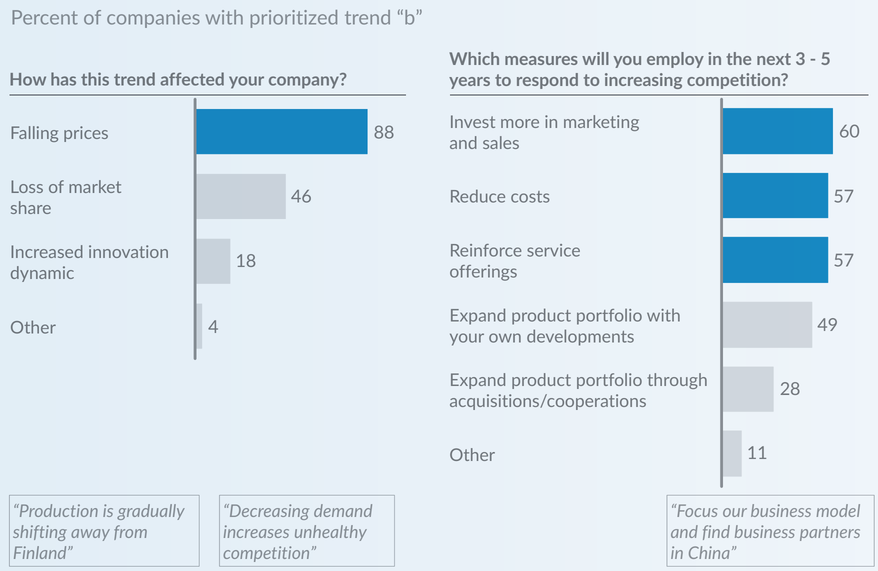


Exhibit 24

Interestingly, combined machinery, metals, and electronics imports from China, India, and South Korea to Finland decreased with a 25 percent compound annual growth rate from 2010 to 2013.[15] So, until now, the new competition has been faced outside Finland.

13 Brunei, Cambodia, Indonesia, Laos, Malaysia, Myanmar, the Philippines, Singapore, Thailand, and Vietnam
14 Historical GDP figures from ASEAN. Forecasts from IHS
15 Finnish Customs Uljas database, October 2014

The main effect of increased competition for survey respondents is falling prices, with 88 percent of respondents indicating that their company has been affected by it (see Exhibit 24). Combined with high production costs in Finland, falling prices is a challenge, and, thus, it is increasingly important to compete with other attributes besides just price. A loss of market share was cited by 46 percent, which would make sense in light of import statistics. However, companies are planning to take action as well: investing more in marketing and sales (60 percent), reinforcing service offerings (57 percent), and reducing costs (57 percent) were the key courses of action.

C. GLOBALLY SYNCHRONIZED ECONOMIC CYCLES

Increased synchronization of economic cycles was cited as the third most relevant trend, and it was perceived as a threat to competitiveness.

The main implication is that companies see this translating into uncertainty – decreasing reliability of forecasts and budgets as well as difficulties in adjusting production capacities were named as the two top concerns (see Exhibit 25). Production costs rise due to volatility and unpredictability.

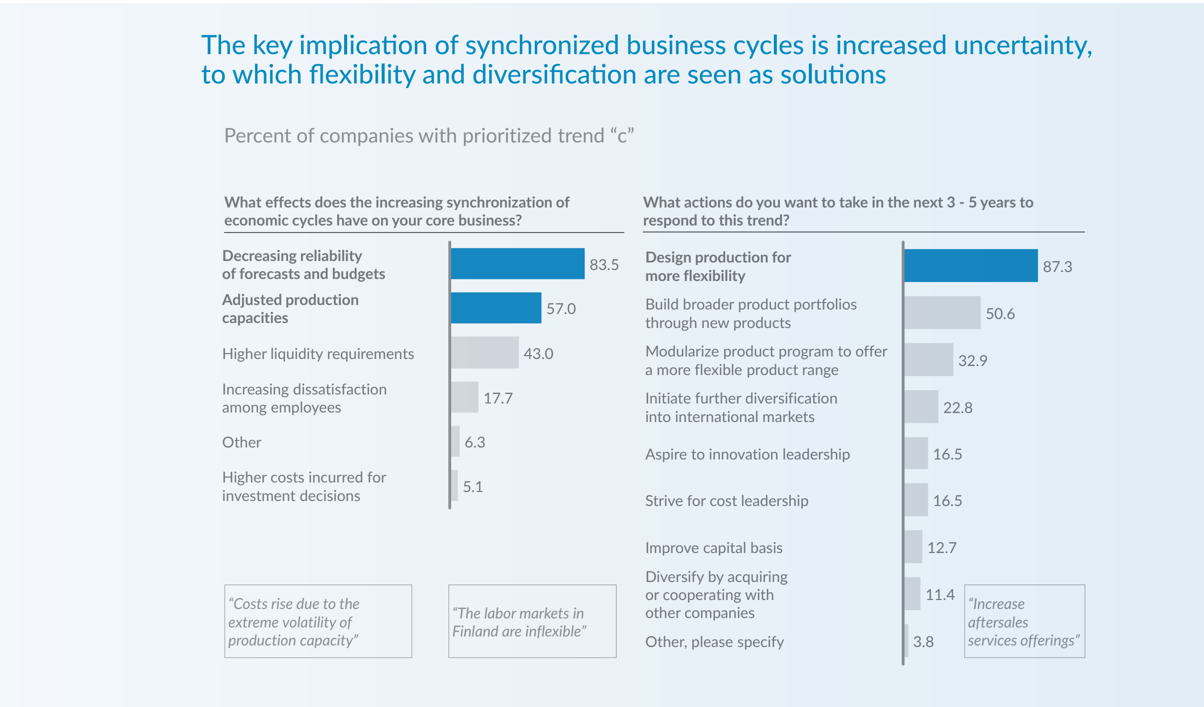


Exhibit 25

Flexibility and diversification were seen as the main solutions. Of the survey respondents, 87.3 percent indicate that they will design their production to allow for increased flexibility. Building a broader product portfolio to counter the increasing volatility is the goal of 50.6 percent of the respondents.

In Germany, the solutions to counter the trend were somewhat different, with 79 percent citing production flexibility, 60 percent further diversification into international markets, and 54 percent innovation leadership. Furthermore, synchronized economic cycles were perceived to be only the tenth most relevant trend for competitiveness by the VDMA survey respondents.

D. INCREASING IMPORTANCE OF AFTERSALES SERVICES

Aftersales services were ranked as the top opportunity for the future among survey participants. Higher focus on these business areas was also linked with higher profitability in the success factor analysis. Some companies even cited increasing service offerings as a means of countering volatile economic cycles and diversifying risk. There are clear windows for opportunity in this area, and Finnish companies readily acknowledge this.

Currently, the biggest challenges for participating companies lie in rapid response times in service and employee expertise (see Exhibit 26). Online services, remote maintenance, availability of spare parts, and pricing were not generally seen as difficult to manage.

In aftersales services, rapid response and employee expertise are the key challenges to which companies are responding

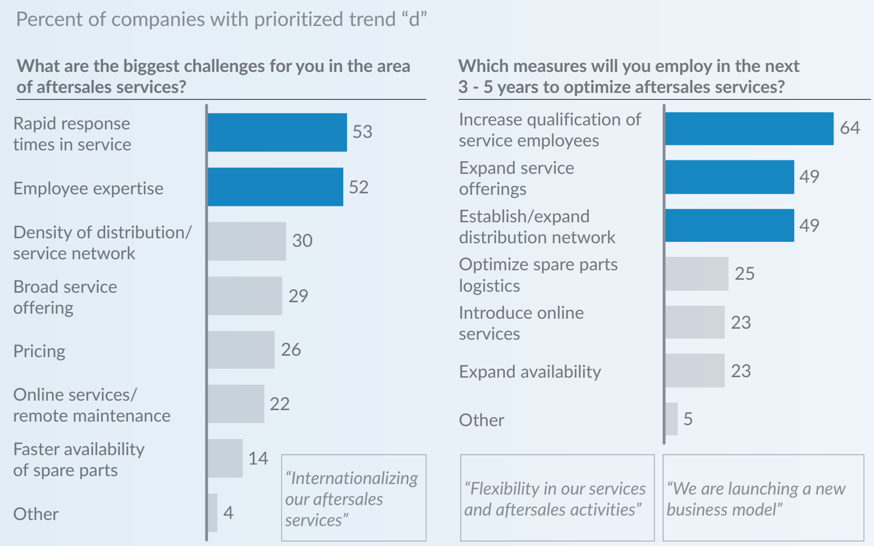


Exhibit 26

Companies are already planning to take action and improve service offerings though increased employee qualification, with 64 percent of participants indicating they will undertake this measure within the next three to five years.

Forty-nine percent of respondents also indicated that they would expand service offerings, and 49 percent also plan to respond through establishing and expanding the distribution networks of aftersales services. Some respondents indicated that they are faced with the task of moving their service and maintenance abroad to better respond to customers located in emerging markets, reflecting the overall shift of demand and new customer preferences.

Online services and expanding availability are not generally viewed as priority measures. However, despite low perceived importance, online could be an important and innovative route for smaller players to scale up aftersales in a smart and cost-efficient way. For example, certain advisory services, instant help, and ordering of parts could potentially be moved online at least to some extent. Online services could also improve the availability of these services for products located in distant markets.

E. DISRUPTIVE TECHNOLOGICAL INNOVATIONS REVOLUTIONIZING PRODUCTS OR PRODUCTION PROCESSES

Disruptive technology, the fifth most relevant trend, was perceived to be a clear opportunity among surveyed companies.

To fully leverage this trend, 60.3 percent of participating companies aim to increase integration and codevelopment of products with their key customers (see Exhibit 27). Increasing R&D expenses is the aim of 46.6 percent of respondents, and 45.2 percent plan to monitor the market more intensely to keep up with the latest technological

Codevelopment with customers, expanded R&D, and close monitoring of markets are seen as the main actions for capturing the disruptive technology opportunity

Percent of companies with prioritized trend "e" in respective association (N = 138)

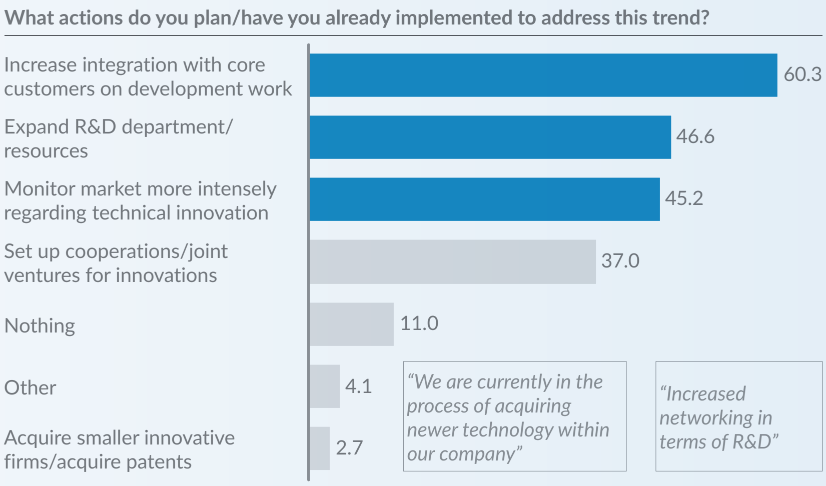


Exhibit 27

developments and innovations. Some also plan to coordinate and cooperate with innovation joint ventures (37.0 percent), and 11.0 percent of respondents do not plan to respond to technological change, but they represent a small minority.

Altogether, this indicates that companies acknowledge the importance and opportunities related to technological disruption and innovative change and are undertaking measures to embrace this trend.

F. FINLAND AS A KEY FACTOR FOR COMPETITIVENESS

Overall, Finland as a location was only ranked the eighth most relevant trend and is perceived to be slightly more of a threat to competitiveness than an opportunity. In Germany, the same trend was ranked fifth in relevance and seen as representing an opportunity for responding companies.

Generally, Finland is regarded as a safe place to conduct business with a reliable infrastructure, strong legal frameworks, and established value chains. These answers reflect the overall stability and safety of Finland as a location (see Exhibit 28). Availability of highly qualified personnel is also a key advantage for local companies – there is no shortage of skilled employees even for tasks requiring a high level of expertise. Furthermore, the strong national reputation "Made in Finland" is still regarded as one of the strongest benefits for doing business in the country.

Cost-driven disadvantages have started to outweigh the traditional strengths of Finland as a country to do business in

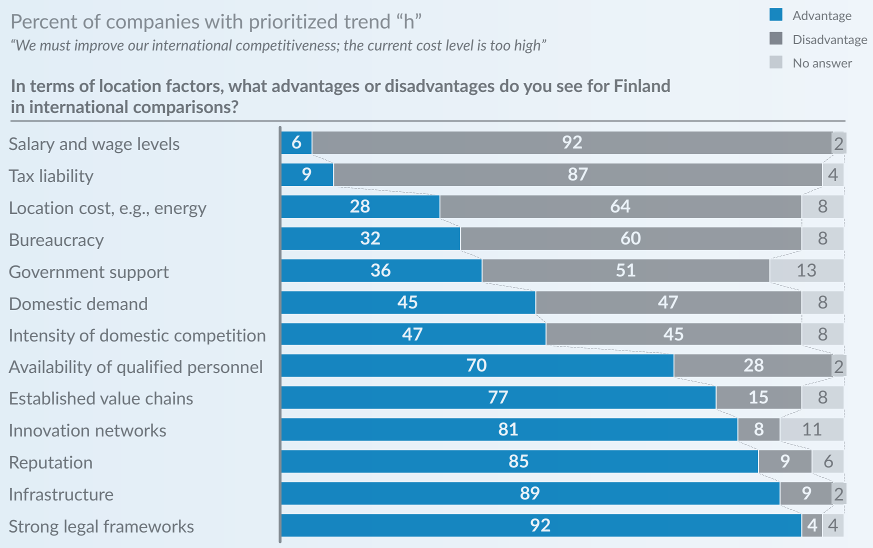
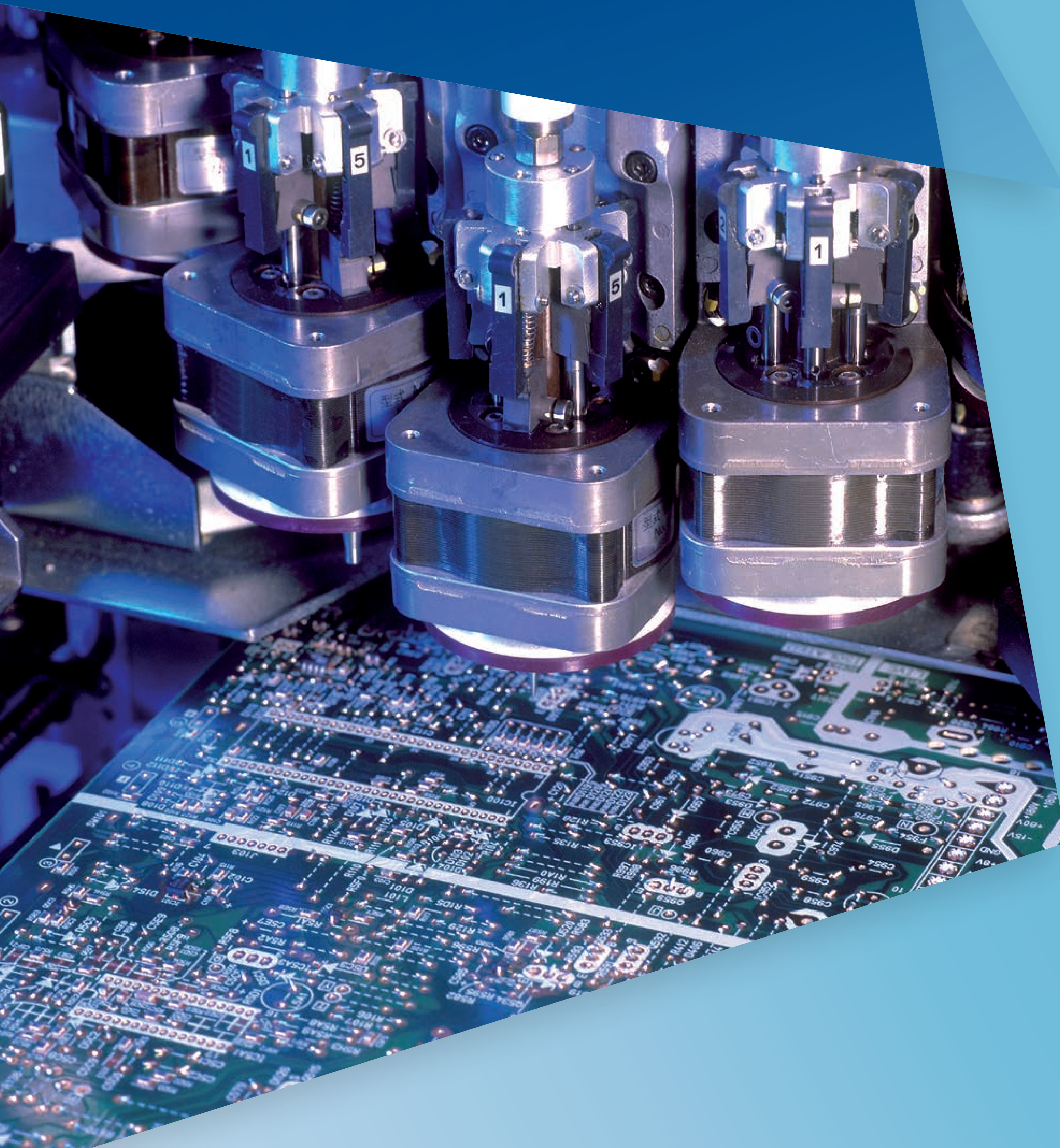


Exhibit 28

However, cost-driven disadvantages have started to outweigh some of these traditional strengths. The vast majority of respondents (92 percent) cited salary and wage levels as the main disadvantage, followed by tax liabilities (87 percent). These factors combined with increased competition and falling prices could be a challenging combination for companies that do not take measures to tackle the changing competitive environment.

In the German VDMA study, the overall ranking of advantages and disadvantages was relatively similar to the Finnish responses, but the key difference was that Germans perceived their location to be one of their main advantages, citing similar reasons, such as good reputation, infrastructure, legal security, and established value chains. To German firms, the reputational and stability-related advantages of being based in Germany outweigh the cost-based disadvantages.

FIELDS OF ACTION



The decision makers in Finnish machinery, metals, and electronics see an operating environment around them that is changing rapidly. They also think that each of the top three trends is more of a risk than an opportunity for them. Furthermore, the Finnish respondents feel significantly less prepared to address these trends than their German counterparts.

We see these findings as a strong call for action. Luckily, Finnish companies have a lot to build on. Finnish companies that internationalize early and invest in innovation are more profitable and grow faster. Growth is also a key driver of profitability – margins increase in line with company size.

We identified three fields of action for Finnish companies to consider in addressing global trends while building on proven success patterns (see Exhibit 29).

The top trends influence the importance of the 9 success patterns and reveal important fields of action

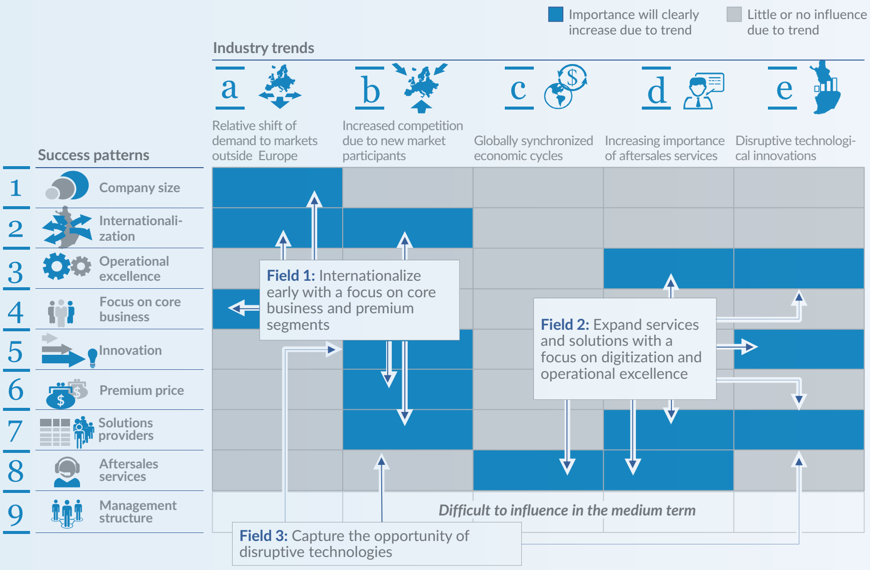


Exhibit 29

FIELD 1: INTERNATIONALIZE EARLY WITH A FOCUS ON CORE BUSINESS AND PREMIUM SEGMENTS

A large share of revenues from international markets and an emphasis on premium-quality and premium-price segments do, on average, correlate with both the growth and profitability of Finnish companies. Furthermore, although profitable diversifiers do exist, a clear focus on core business is, on average, linked to higher profitability.

Recommended courses of action. Companies must rigorously prioritize the markets they plan to enter and employ the appropriate strategy. Markets and segments should be split and assessed separately. It is crucial to look at how large of a market share the company can expect to gain and at what growth rate, whether considerable barriers to entry exist, and other aspects such as political stability and then prioritize options accordingly. Each market should have a tailored market entry strategy – not one size fits all. Entering a small premium market in Western Europe is a very different playing field than gaining foothold somewhere in a large, emerging market, such as Southeast Asia or Latin America.

The entry approach also depends on the size of the company and level of internationalization: for small companies beginning the internationalization process, the establishment of sales and service avenues is important. Larger companies further in the process must consider whether and which operations should be further shifted directly into the new markets.

When catering to customers in the premium segment, it is important to ensure that the company is offering what is generally required at that level. This may mean an extensive offering, a network of maintenance and aftersales services, and preparedness to offer increasingly tailored solutions for customers. Companies should attempt to map out what an increased focus on the premium segment concretely means for service lines, product offerings, marketing, and different geographical markets.

Furthermore, a premium segment may mean different things in Western Europe than in emerging markets. This should be taken into account when tailoring the offering and pricing of premium products for emerging markets. For example, what is perfectly acceptable as a premium price in Europe may simply be too expensive in Asia. Thus, companies should consider lower prices – though still premium in comparison to local competitors – in some cases in emerging markets. In these cases it is important to manage parallel trade, i.e., lower-priced premium products being imported back into developed markets, through, e.g., having a separate product line for emerging markets.

Focusing on the core business will not only come into play through offering a better and more targeted product, but also through having the ability to improve and refine the processes of, e.g., manufacturing, distribution, and marketing. Diversified companies could consider selecting the best-performing or high-potential segments and put less emphasis on less profitable ones, freeing up firm resources for additional development. Growth limits from a smaller market size associated with focus on core business can be addressed through, e.g., geographical expansion to other markets and a bigger emphasis on aftersales services.

Benefits for responding to trends. Creating a rigorous, multilevel internationalization strategy will mitigate the risks associated with demand shifting outside Europe. Now is the time to act. For example, in niche segments, many untapped opportunities still exist, and if the market is entered early enough, it may be possible to gain a considerable market share. Offering a premium-segment solution can also further differentiate the company from local, low-cost competitors and increase margins. Otherwise, it may be difficult for a small Finnish company to compete with bulk producers from low-cost countries. Focusing on the core business makes it easier to adapt a clear strategy and assess entry into new markets, develop and offer a wider selection of product aftersales services, and refine both processes and product development.

Success case example. Ponsse is a good example of a company that has successfully internationalized while maintaining focus on its core business. The company took the first steps towards internationalization in 1974 – four years after the company was established, and, today, more than two-thirds of sales come from outside Finland. Throughout the years, Ponsse has maintained a focus on its forest machinery core business and built its reputation as a high-end provider through technological leadership.

FIELD 2: EXPAND SERVICES AND SOLUTIONS WITH A FOCUS ON DIGITIZATION AND OPERATIONAL EXCELLENCE

The survey findings strongly support the view that a focus on solutions and services can drive growth and profitability. However, a focus on these areas also increases complexity, making operational excellence critical. Furthermore, in services, digitization is a major technological force driving change, and Finnish companies must leverage this trend.

Recommended courses of action. Services can come in many forms, starting from basic spare parts and maintenance provisions to a full-blown outsourced solutions model combining products and services across the lifecycle, e.g., airplane engine manufacturer GE Aviation sells flight miles instead of just products and maintenance.

The key consideration for companies is to tailor the approach but not to miss out on services and solutions opportunities. A clear understanding of the customer and different customer segment needs is key: which solutions create customer value, what are the implications of a machine breakdown for customers (safety, high costs of downtime), does the company have global presence, where are its customers located, should basic or premium-segment customers be catered to, and so forth. Naturally, these will affect the nature of services and solutions demanded, and the approach should be tailored to the answers to these questions.

Digitization is currently a major transformative technological force, and Finnish companies should truly leverage it in industrial services and solutions. Digitization, e.g., in the form of remote-controlled equipment, not only improves cost efficiency and productivity but also brings forth completely new business models through closer integration with customers' core businesses. As with other sectors that have already gone further in this transformation, e.g., retail and consumer electronics, the change can be rapid. Companies should not risk falling behind in these developments, but rather, they should lead the way.

Small companies, in particular, face the question on how to establish an international service network in the most cost-effective and feasible way. Partnering with other local mechanical engineering companies or specialized service companies may offer a solution, as could leveraging a new technology such as remote monitoring.

Furthermore, it is even more crucial to maintain operational excellence when increasing services and solutions offerings. Cost effectively meeting customer needs in an increasingly complex environment increases the importance of considerations, such as rapid response time, spare parts delivery, and the ability to provide tailored service packs.

Benefits for responding to trends. However, figuring out the right strategy for establishing the network and tailored services and solutions that build on digitization and operational excellence will pay off. Good services and solutions can increase and stabilize revenue, promote product differentiation, and increase customer loyalty. Good and stable aftersales are especially useful in stabilizing the cash flow in a more volatile global economic environment. If a leasing concept and remanufacturing are used, the stabilization effect is even larger, and additional revenue can be obtained from capturing the secondhand machinery markets.

Aftersales also serve to increase the product appeal to premium-segment customers. When exporting products abroad, if local alternatives and other competitors provide good aftersales, the exporting company must also respond. Furthermore, providing good and extensive aftersales services differentiates the company and shields it from increased competition. At the same time, operational excellence not only serves to improve customer satisfaction, but it also refines processes, causing them to be more efficient, flexible, and cost-effective.

Digitizing service operations can act as a key enabler in all of this in terms of cost efficiency, productivity, and new business models required for more advanced service concepts. Embracing the trends early on helps Finnish machinery, metals, and electronics industries stand out against the competition.

Success case example. Finnish medical furniture, e.g., hospital beds, operating tables, and massage tables, manufacturer Lojer is a good example of a small company that has successfully expanded into services. In addition to spare parts, Lojer offers hospitals a "Functioning Care Facility" concept where Lojer owns and takes full responsibility for the equipment and its maintenance.

FIELD 3: CAPTURE THE OPPORTUNITY OF DISRUPTIVE TECHNOLOGIES

Finally, to fully reap the benefits of innovation and internationalization, many Finnish companies can benefit from positioning their R&D to also address the opportunities of emerging, disruptive technologies, e.g., digitization in terms of both operations and products (also see Field 2), new manufacturing technologies or product features, use of big data to gain insights, Industrial Internet, and additive manufacturing.

Recommended courses of action. Adapting new technology can extend its benefits across all operations – particular challenges or opportunities presented to the company should be considered when selecting the most suitable technological path.

One concrete example of the benefits of adapting disruptive technology can be found in various Industrial Internet applications. Industrial Internet can help companies simultaneously offer higher-quality products for customers and improve internal processes. For a solutions-focused business, having all the parts of the machinery linked together and sharing information, even for different geographical locations, can provide productivity increases for the customer and insights into machinery performance. Similarly, in aftersales and maintenance services, Industrial Internet can enable remote monitoring of machinery and help optimize maintenance schedules, decrease response times, and identify the nature of the problem prior to physically visiting the location. This can be particularly helpful when dealing with international customers.

If serving the premium segment, adopting new technology for both products and services may be a prerequisite in keeping up with the competition. However, technology should not be adopted merely for its own sake – the cost of adding the new features to products should match the benefit or cost savings that the customer achieves from adopting the improved product. Close collaboration with customers in developing new products helps achieve this.

Most importantly – companies should not underestimate the long-term impact of disruptive technology. It is better to start preparing now rather than later versus risking falling behind.

Benefits for responding to trends. Adapting disruptive technologies early on offers companies a prime opportunity to leverage the first-mover advantage for new technologies in selected markets, improve cost efficiency and profitability in manufacturing, better serve the premium segment, and respond efficiently to needs resulting from increased internationalization and the network of aftersales.

Finland is a technologically advanced country with a lot to offer in terms of technology, qualified personnel, and quality – if utilized correctly, fully leveraging these factors can justify a higher price for “Made in Finland” and change operating here in Finland from a concern into an opportunity like in Germany. All of this further serves to differentiate Finnish machinery, metals, and electronics from the competition.

Success case example. So far, large Finnish companies like KONE and Konecranes have been leading the way with disruptive technologies. For example, Konecranes has made significant investments in Industrial Internet, enabling the remote controlling and monitoring of cranes. Konecranes plans to have all its new products connected with Industrial Internet by 2020.

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