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1 Why Go Global? The Multinational Imperative

Summary

Globalization is not a new phenomenon. The networking of the world's economy has been evolving for centuries, with companies gradually expanding beyond their national borders. What is new is the dramatic acceleration of this process. The rapid networking of global communications is being mirrored by web-like value chains that increasingly span the world.

Global production provides an unparalleled opportunity for companies to grow into new markets while at the same time boosting their competitiveness. However, most of today's networks are legacy structures – only a fraction were strategically planned. As a result, there is huge potential to be captured from rethinking traditional structures, approaches, and supply relationships. And huge potential for getting it wrong. Our survey showed that production network redesign can cut a company's manufacturing costs by up to 45 percent – but over half the players achieved savings of only 10 percent or less.

This book focuses on the three industries covered by the ProNet survey: automotive engineering, machine tool manufacturing, and electronics. Their profiles are all very different, whether we look at the footprint and corporate history of key players, market characteristics, product and production technologies, or their cost structures. The beauty is that this breadth makes the results representative far beyond these three sectors. Their patterns and drivers can help to identify optimal global networks throughout the manufacturing industry.

This first chapter lays the groundwork by elucidating the historical background to globalization and reviewing the drivers and goals of the current race to go global. It then examines the status quo of our three focus industries, with an overview of their survey findings. The rest of the book, based on the results of that analysis, offers practical guidance for companies planning to reconfigure their global footprint.

Key questions, Chapter 1

- What different phases has the globalization of production gone through over time?
- What are the reasons for the increase in global production?
  - What factors in the equation have changed?
  - What are the underlying long-term trends?
  - What influence are these factors and trends having on existing industries?
- What objectives do companies pursue with the globalization of production?
- Are these objectives realistic? What successes have been achieved so far?
- How does the status quo of manufacturers differ across the three focus industries – automotive engineering, machine tool manufacturing, and electronics?
- What implications do the developments outlined above have for these three industries?
- What is the current status of the globalization efforts of the three focus industries?

1.1 Phases of Globalization

International trade has existed since recordkeeping began. Herodotus, known as the "Father of History," wrote detailed reports about the trade in spices, silk, glass, porcelain, and incense between Asia and Europe along the Silk Road around 430 BC.[1] Highly specialized economic structures formed along the value chains of these goods in specific geographic regions. These early know-how clusters[2] led to **local production monopolies**. Large regional price differences (due to manufacturing advantages) made trade in these items attractive despite the rudimentary **transport** available. Global trade has advanced steadily ever since. Globalization only entered a new era with the dawn of the Industrial Revolution. **Three phases** can be distinguished, from cross-border trading to globalization in its current form (Figure 1.1).

1.1.1 Before 1930: Mainly Sales Offices Abroad

Sweeping technical innovations such as the railroad promoted the cross-border exchange of goods from around 1850 onwards. The simultaneous rise of **mass production** and its corresponding **economies of scale**[3] paved the way for the manufacture of large unit volumes. The introduction of stock corporations as a legal entity facilitated access to capital, loosening restrictions on freedom of movement and opening up new structural options. Stock corporations used these opportunities to expand their customer and supply markets, intensify their international trade relationships, and set up **sales outlets abroad**. However, inadequate means of communication set

[1] *Cf. Franck (1986).*

[2] *Clusters are self-reinforcing networks of producers, suppliers, research institutions, service providers, and related institutions that operate along a value chain. The members are connected with one another through supply or competitive relationships and/or shared interests. One cluster with a long history is the concentration of US automotive industry players in and around Detroit.*

[3] *Economies of scale define the dependence of production volume on the factor inputs used. They occur when the production volume rises faster than the factor inputs and the unit costs fall with increasing unit volume, e.g., due to better utilization of machinery or labor or better purchasing terms.*

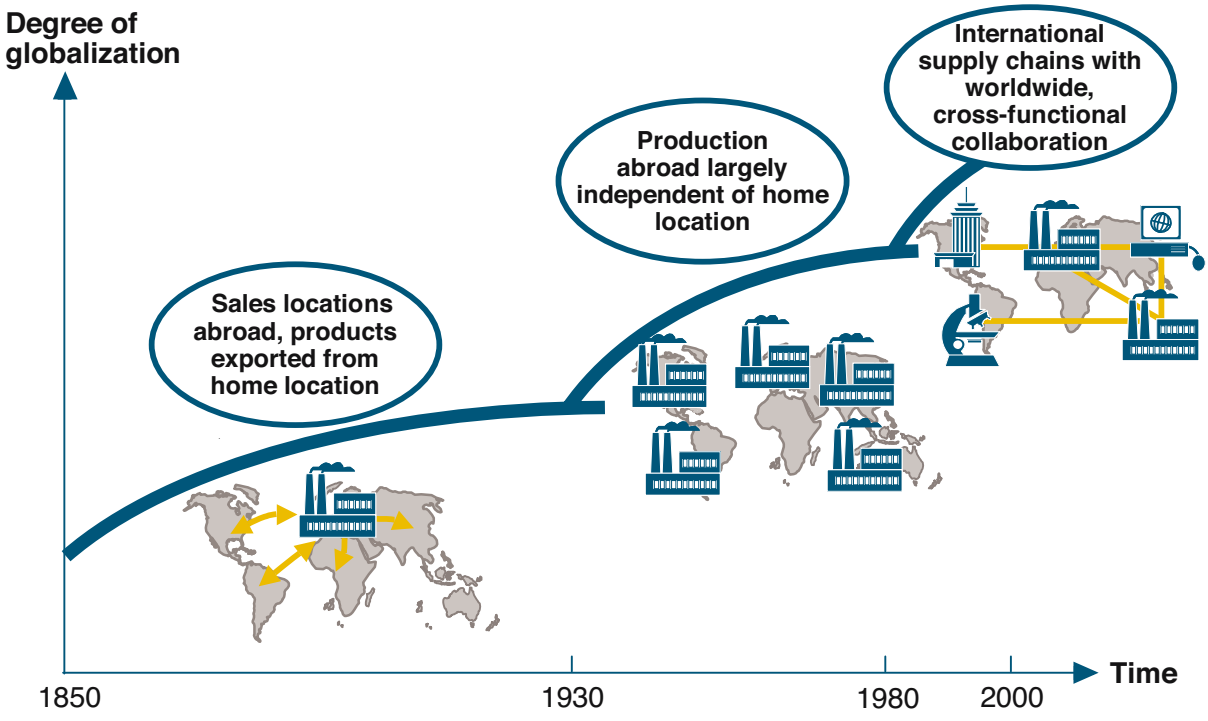
limits to the expansion drive. Telecommunications was in its infancy, and information could barely move faster than goods. Foreign branches therefore mostly acted autonomously. Because corporate centers were unable to give guidance across long distances, manufacturing in foreign countries was rarely economically viable. Production networks in the current sense of the term did not exist. It was only when telecommunications became established at the beginning of the 20th century that it became possible to create a cost-effective network of production facilities in different countries. Delayed to some extent by World War I and the subsequent economic recession, production facilities abroad did not start to multiply substantially before 1930.

Siemens is a good **example**. Founded in 1847 under the name "Telegraphen-Bauanstalt von Siemens & Halske," the company found itself in a crisis in the early 1850s due to a lack of orders. Business deals with Russia and England gave it a fresh boost. In 1853, Siemens & Halske started to build the Russian telegraph network as its first ever foreign venture. In 1858, it founded a subsidiary in England. Its chief activity was laying ocean cables, produced at Siemens' first foreign plant in Woolwich from 1863 onwards.

This rapid **internationalization** had begun shortly after the company was set up and – with the exception of the Woolwich plant – consisted mainly of **sales offices**. However, the sites were still relatively independent of one another, and it was not yet possible to establish more intensive communication or supply chains. Production plants abroad did not increase significantly until 1930 onwards (Figure 1.2).

The nature of globalization has changed over time

Fig. 1.1: Development of globalization in three phases



Source: McKinsey/PTW (ProNet analysis)

1.1.2 1930 to 1980: Largely Independent Production Abroad

After World War I and the world economic crisis, powerful companies arose that continued to grow fast and steadily. The triumphal march of the **brand names** began. Coca-Cola, Mercedes, and IBM became famous the world over. Increasingly low-cost, effective communication made it possible to manage companies of unprecedented scale. Organic growth and acquisitions formed industry giants that were able to tap major economies of **synergy and scale**.

Companies used their size and dominance on the home market to open up foreign markets. Production at the home factory was still not very closely integrated with production abroad. Foreign facilities mostly operated independently, aimed at developing new markets via **local production**. Their financial strength generally enabled them to implement this strategy quickly. They would often acquire competitors abroad to spare themselves the risky and time-consuming process of setting up their own sites.

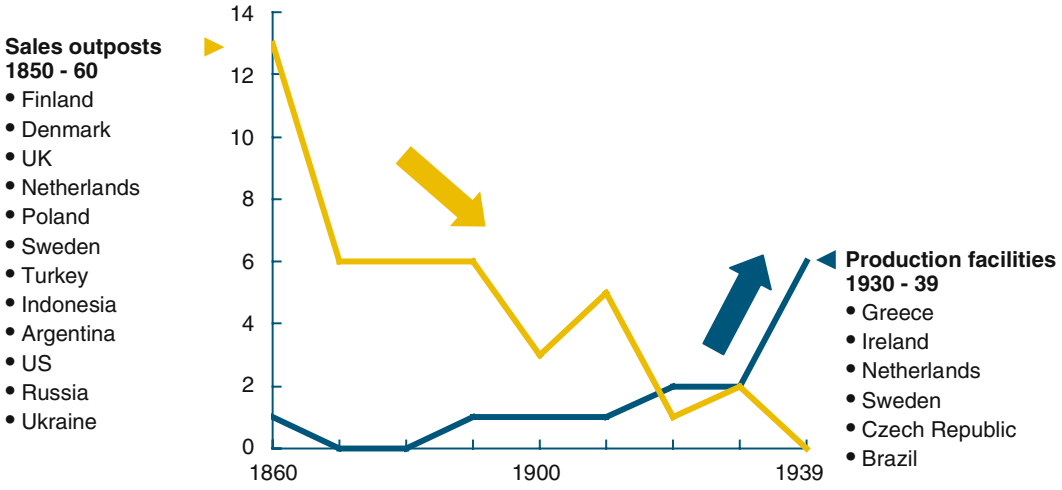
General Motors (GM), for example, grew apace in its US domestic market, taking over 25 companies in the first three years of its existence. In 1931, it overtook Ford as the largest OEM in the world, and has retained this position ever since.

However, growth opportunities on the home market flattened off over time. This was barely surprising – it had a market share in the US of over 50 percent at times. The obvious course of action was to expand abroad. In 1925, GM opened its first foreign plant in Argentina, and then took over the German Adam Opel AG in 1929.

After World War II, during which GM exclusively produced military equipment, its globalization continued. It began production of Holden[4] brand automobiles in Australia in 1948, and opened Venezuela's first ever

Pioneers started out with sales offices abroad as early as the 19th century, but did not move much production abroad until after 1930

Fig. 1.2: Development of Siemens' foreign activities
Number of new start-ups per decade



Source: Siemens

[4] *Holden is an Australian automobile brand founded by General Motors after World War II on the initiative of the Australian government.*

automobile factory in the same year. Its foreign plants had extensive freedom of development, production management, and product design.

1.1.3 Since 1980: Globally Networked Production and Cross-Functional Collaboration

The third era after 1980 was characterized by deregulation, a converging world economy, rapid technical progress, and declining transaction costs[5]. Trade barriers fell, GATT rounds[6] led to reductions in tariffs, and customs unions such as the EEC were founded, precursor to the EU. The economic powerhouses of the West became increasingly intertwined. It was during this period that the concept of globalization took on the significance it has today.

The internal and cross-organizational networking of companies grew in the following period much faster than markets went global (Table 1.1). **CKD and SKD assembly** were widely used.[7] Firms tapped economies of scale by manufacturing basic components centrally. Products were also tailored to customer requirements locally. Companies that grasped the opportunities of this new form of globalization quickly found themselves with a strong competitive advantage.

Global cooperation took on a new quality at the end of the 20th century. Customers no longer just exchange goods and supplies across borders. Staff at far distant locations work on the same projects on a daily basis. A business unit's functions – whether R&D, production, HR, or marketing – may well be spread throughout the world. The challenge is not just to connect individual companies and corporate units, but to set up corporate functions at the best location for each, and manage them as a network. Technologies such as the Internet and digitized communication underpin this, linking up the advantages of local know-how clusters with the factor cost benefits of distant locations. The rapid exchange of information and intangible assets is leading to a global knowledge network. And – on a historical time scale – this development has only just begun.

Table 1.1: Intra-industrial trade as a share of the export trade of industrialized nations

	1954	1964	1980	1990
Germany	42%	54%	65%	79%
US	54%	71%	73%	85%
Japan	29%	34%	25%	44%
Other industrialized countries	55%	65%	71%	77%

General Electric is the archetypal global conglomerate – not least due to the acquisition of almost one thousand different companies by long-time CEO Jack Welch. GE is regarded as a pioneer in offshoring corporate services to far-flung locations abroad. In the early 1990s, Jack Welch introduced the 70:70:70 rule. This stood for moving 70 percent of labor to low-cost locations, 70 percent of this to so-called offshore development centers, and 70 percent of that in turn to India. What this ultimately meant was that 30 percent of GE's back-office activities were relocated to India. These were primarily administrative and support functions, such as data processing, information services, operational IT consulting and support, and call centers.

As a consequence, the group's financial services company GE Capital International Services (GECIS), which originally operated from the United States, launched its globalization in 1997 with a location in India. GE put a figure of 25 to 60 percent on the savings, depending on the business segment. Further sites in Mexico, Asia, and Eastern Europe followed. In 2005 GECIS became independent and changed its name to Genpact. In 2006 it was operating with 26,000 employees in 11 countries on 3 continents.

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[5] *Transaction costs: The costs or expenses incurred for the exchange of goods. In connection with production networks, this particularly refers to customs duties, transport costs, shipping insurance, and communication costs. The capital tied up in transportation and depreciation of the goods during transportation also count as transaction costs in this context.*

[6] *GATT: General Agreement on Tariffs and Trade.*

[7] *CKD (completely knocked down) and SKD (semi-knocked down) describe modes of manufacturing where assembly kits are produced for export. Final assembly is performed locally.*

[8] *Cf.: http://www.genpact.com*

GE does not exclude tasks requiring high qualifications from global teamwork. The concept of "Sunrise Development" has seen engineers and designers work round the clock across continents on shared projects.

Globalization is accelerating

Globalization has not just changed its face over time, it has gathered significant speed in the past few years (Figure 1.3). This is also reflected in the number of direct investments, which have risen exponentially since the mid-1980s. The foreign investment base has more than trebled within ten years. By 2003, private investors, companies, and states from across the globe had invested over USD 8 trillion in foreign companies, real estate, or finance deals. This corresponds to the combined gross national income of Japan, Germany, and France in one year. And the regional focus of investment has been shifting increasingly. In 2003, China overtook the US for the first time as the main target for direct investments.

Meanwhile, producers around the world are engaged in building up efficient global production networks. An analysis shows that the international operations of major corporations are growing faster than in their home countries (Figure 1.4). This relates primarily to revenues, but also to assets and staff as production facilities are established.

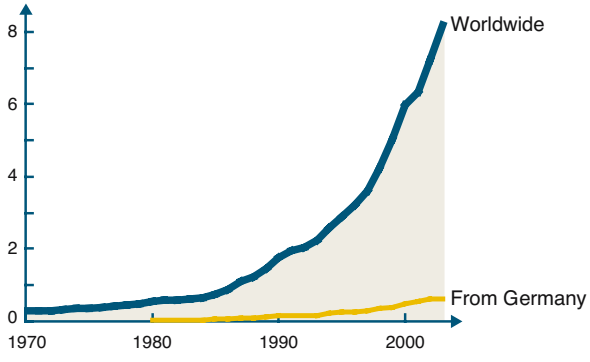
As a result of globalization, whole industries are being redefined. Within just 10 to 20 years, the focal areas of global production are shifting dramatically. Some industries – such as textiles or consumer electronics – have already completed this development.

A good example is the production of TV sets (Figure 1.5). The share of production in high-cost countries fell within two decades from 75 to 20 percent. This development was accompanied by a fundamental change in the market. New competitors from low-cost countries captured significant market shares. Brands considered established today, such as Samsung, Sharp, or Lucky Goldstar (LG), were largely unknown in the Europe of the early 1980s, and were able to gain ever more ground from domestic manufacturers because of their attractive price-performance ratios. Former greats, particularly German consumer electronics manufacturers such as Schneider, Grundig, or Telefunken, went bankrupt. Other European manufacturers such as Thomson or Philips managed to turn themselves around only by making drastic changes in their production networks and forming alliances with attackers from low-cost countries.

A further development that will change industry structures is currently emerging, particularly for products in the electronics sector. Although traditional product suppliers often initially invested in building up their own production locations abroad, gradually toll or contract manufacturing developed into an ever more attractive option – emerging as the business model of the electronics manufacturing services (EMS) provider. EMS providers perform operational services for OEMs[9] – particularly the manufacture and assembly of products for end consumers – at very attractive terms and conditions.

The level of international integration is rising exponentially

Fig. 1.3: Direct investments* abroad
USD trillions

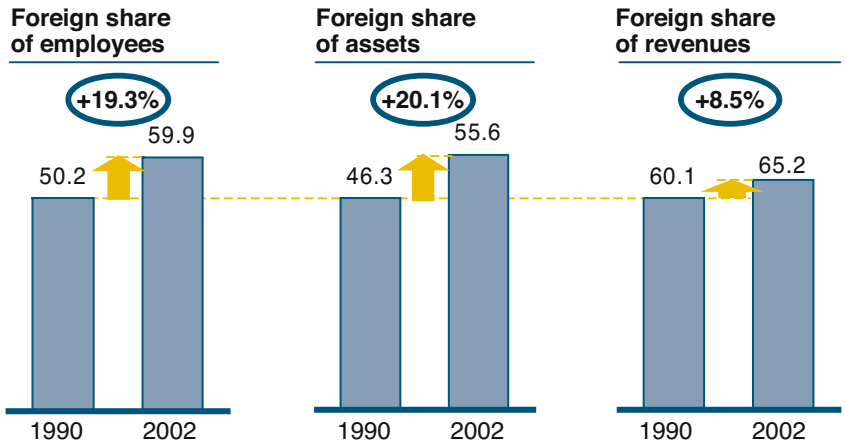


* Foreign investments worldwide
Source: World Trade Organisation (WTO)

[9] *The term Original Equipment Manufacturer (OEM) describes a manufacturer whose products are sold under a brand name as a single unit; an OEM normally buys components from other manufacturers, integrates them unchanged into its own products, and sells the resulting total package to end customers.*

Globalization has accelerated: Companies are growing abroad faster than in their home markets

Fig. 1.4: Development of international business activities*
Percent

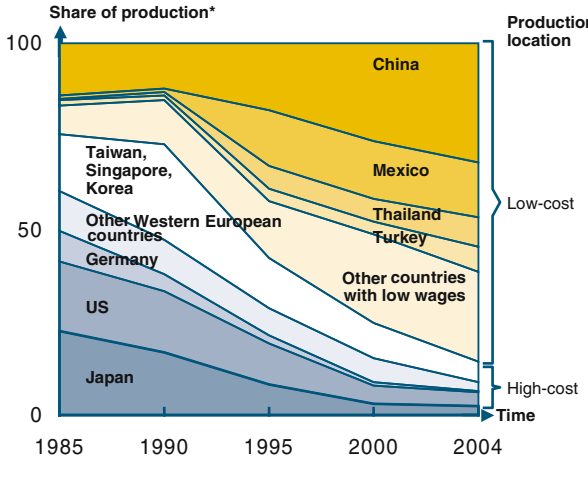


* Analysis covers BASF, Electrolux, Fiat, General Electric, IBM, Philips, Siemens, Sony, and Volkswagen
Source: UNCTAD Transnationality Company Ranking

They achieve significant cost advantages compared with OEMs via specialization, economies of scale, and attractive sites in low-cost countries such as Malaysia, China, Poland, Hungary, and Mexico. Flextronics, for example, the world's biggest EMS company (see Chapter 9), manufactures Sony cell phones, Hewlett-Packard printers, and Microsoft's Xbox. These providers are virtually unknown, whether Flextronics, Solectron, Elcoteq, or Hon Hai. But their customers are global brands.

The market entry of low-cost providers often leads to rapid relocation of an entire industry

Fig. 1.5: Trends in global location of TV production
Percent



* Share of manufactured TV sets with color CR tube
Source: Reeds Electronics Yearbook, McKinsey

The EMS sector has been acting as a **catalyst** for the radical transformation of electronics production worldwide. EMS companies are characterized by very high agility, and frequently changing network structures (Figure 1.6).

When HCC[10] incumbents award production contracts to EMS companies, this often leads to **relocation by**

[10] *HCC refers throughout this book to high-cost countries. We define high-cost countries and high-cost locations as geographies with average gross wages for blue-collar workers at or above USD 15 per working hour. This value includes fringe and voluntary benefits. The value applies for the average working hours in the respective geography, including vacation and average absenteeism. When we convert location currencies to the US dollar, we use the long-term average inflation-adjusted exchange rate, e.g., EUR 1 = USD 1.16, to decouple the findings from the short-term impact of exchange rate fluctuations.*

outsourcing. But EMS providers have been also growing in high-cost countries – particularly by taking over their customers' factories. Traditional players have to watch out that they do not lose their technological edge – and their markets. It is only a question of time before this model gains equal ground in other sectors, too.

1.2 What Are the Forces Accelerating Global Production?

In the 21st century, the globalization of production has taken on an entirely new pace, scope, and scale. The drivers just outlined are no less important, but why are companies going abroad ever faster, with ever more functions?

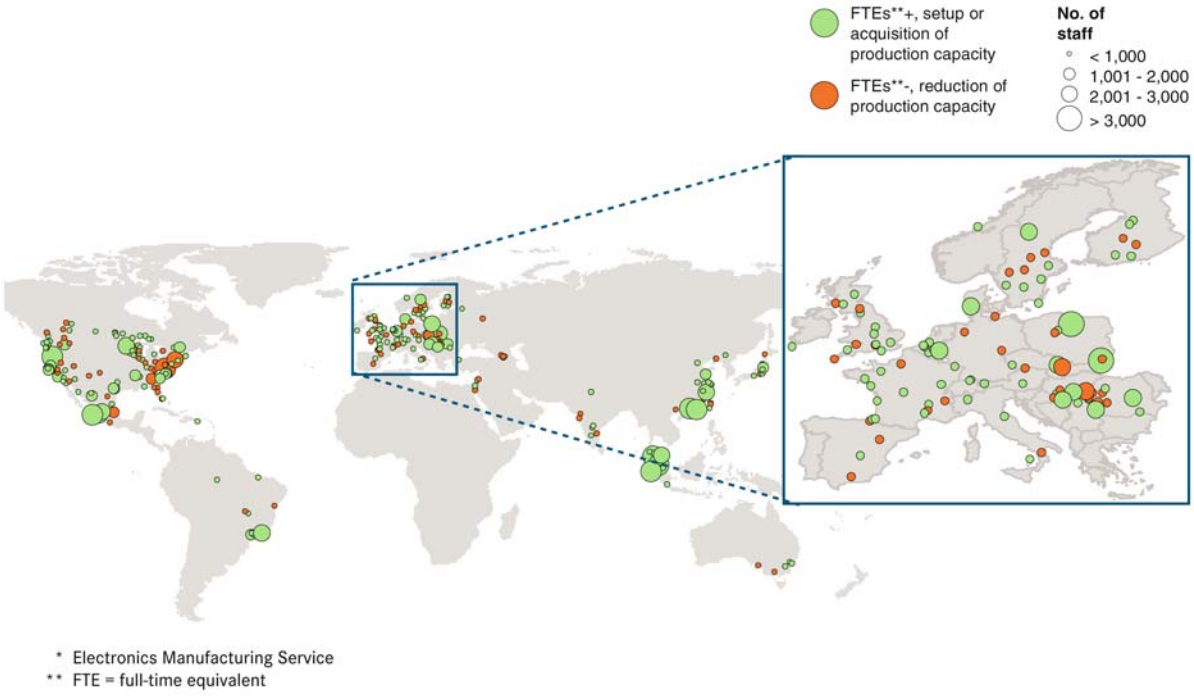
Diverging factor costs and growth are widening the disparity in the attractiveness of different production locations. It has become clear that the wage gap is not going to close between the new entrants to the global economy and industrialized countries anywhere soon. The political reasons are no less important: liberalizing markets and the reduction of trade barriers are shifting the centers of economic activity. Steadily tumbling transaction costs have also helped to vastly reduce the barriers to global production, with falling transportation costs and technological connectivity advancing at lightning speed.

1.2.1 Huge Factor Cost Differences

If manufacturing costs at different production locations are considered in isolation, disparities are mainly apparent in factor costs – and specifically in labor costs. The development of labor costs is clearly closely linked to prosperity: in affluent economies, wages go up; in the others, wage development is curbed.

EMS providers are the catalysts of an entire industry

Fig. 1.6: Change in the production network triggered by the three largest EMS* providers between 1992 and 2002



* Electronics Manufacturing Service
** FTE = full-time equivalent

Source: Press clippings

With the onset of the Industrial Revolution, growth rates in Europe and North America soared. Large parts of the rest of the world, particularly those under communist rule, experienced a very different fate. A misguided economic policy held back development of many other nations. A historically unique **prosperity gap** opened up between the industrialized countries and the rest of the world. This was accompanied by corresponding differences in local wages.

Because of the high and sustained economic growth over five or more decades, labor costs in industrialized nations are very high. Wages in other countries that have been unable to keep pace with this rapid economic development are much lower (Figure 1.7). Following initial speculation after 1990 that labor cost disparities would equalize much more rapidly, the realization has now set in that developing and newly industrialized countries will only catch up with HCCs in the very long term, if at all. In the medium to short term, the differences – in absolute terms – will in fact further escalate. Companies have no choice but to factor in these vast cost differences in their network strategy considerations – not only direct but also indirect labor costs, which greatly influence the price of sourced materials.

1.2.2 High Growth in Emerging Markets

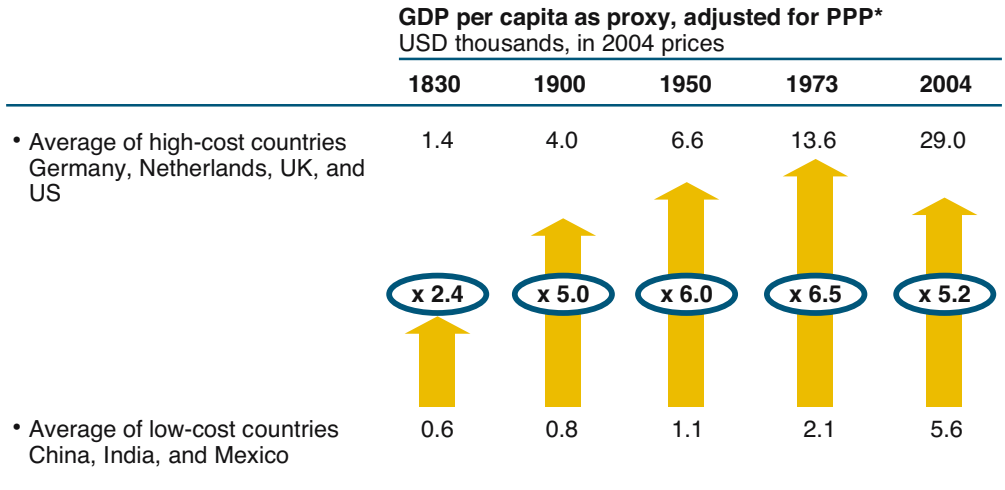
Emerging markets are experiencing very high growth in some segments – both relative and in terms of absolute market volume. Markets outside the highly industrialized world are becoming all the more attractive as a result, particularly for manufacturing companies. These enormous growth opportunities have become the key motivating force for the globalization of production. Demand for many tangible goods in major industrial players' domestic locations, on the other hand, is stagnating or growing only slowly. The main activity at home is merely the battle to carve up market shares.

1.2.3 Lower Transaction Costs

From the perspective of entire networks and value chains rather than just an individual location, a particularly important barrier for global production has been transaction costs.

Global labor cost differences are high, but the gap is slowly closing

Fig. 1.7: Development of labor cost differences
(largely proportional to GDP per capita)



* PPP = purchasing power parity

Source: Maddison (2001), German Federal Office of Statistics (2005)

Transportation has historically been the main cost factor for the global exchange of goods. Up until the spread of the railroads, it was only worthwhile transporting goods with a very high value density and high margins, such as spices, silk, glass, and china. With the surge in new forms of transportation that occurred from about 1930 onwards, costs fell steadily (Figure 1.8). In 2004, the costs of ocean transport were less than 1 percent of the figure in 1830. Nowadays, even transporting goods with a low value density is cost efficient. Sending a cathode ray tube TV set with a 70-cm screen from Turkey to Germany only costs around EUR 10, or about 5 percent of its production costs. For a smaller size, higher value flat panel TV, the cost share would even be lower at around 2 percent.

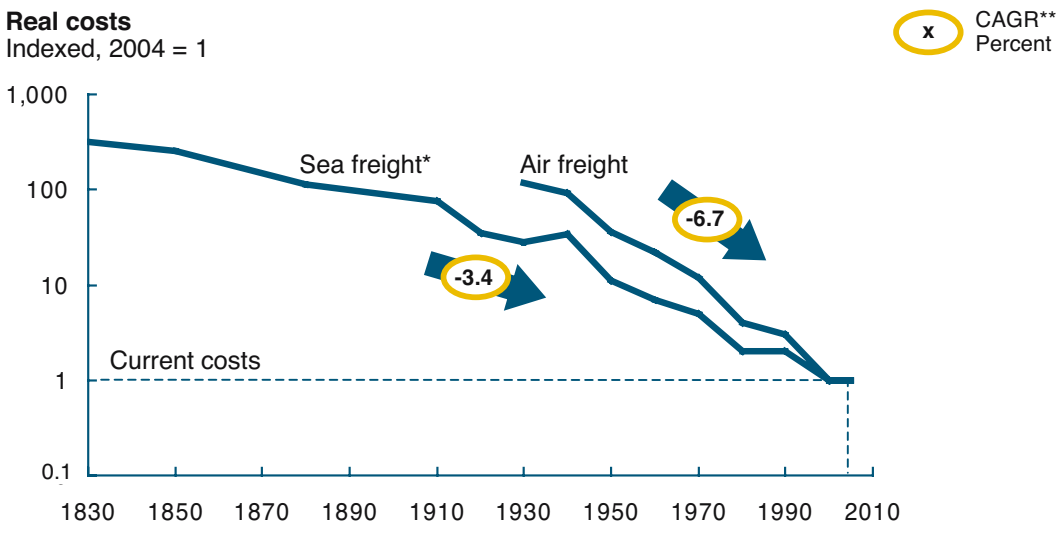
Decreasing transport and communication costs are eradicating the natural barriers to globalization

The productivity gains in logistics are continuing hand in hand with falling transport costs. Ships are becoming ever larger, the crews needed for steering and loading them are shrinking due to automation, and transport risks are declining. The size of ships is leading to natural economies of scale: Less fuel is needed per unit transported. In addition, the fixed costs of supertransporters with a capacity of more than 8,000 containers – from the captain's salary through to pilotage fees – are spread out across a very large volume of goods.

The dramatic progress in communication technology has been the greatest distance killer of all. Whether orders, controlling indicators, R&D engineering blueprints – any and all intangible information can now be transmitted worldwide in an instant. The benefits are shrinking costs throughout the value chain, whether real-time datasharing, satellite-linked networking, remote maintenance or troubleshooting. It is nearly unimaginable that this technology

Transport costs have declined dramatically by historic standards, and have lost importance as a barrier to globalization

Fig. 1.8: Development of transport costs between 1830 and 2004
(mapped logarithmically)



* Figures before 1930 are calculated indirectly, based on the share of transport costs of wheat
** Compound annual growth rate

Source: Baldwin (1999), World Economic Outlook (May 1997)

revolution is still in its early days. Technological connectivity has sent communication costs tumbling, to the benefit of all parties to a transaction. At the simplest level, the price of an international call has fallen to zero with Voice over Internet Protocol systems, and a tiny fraction of its previous costs even using non-VoIP telephony.

The impact of the Internet on consumer behavior is also having a knock-on effect on cost structures worldwide. Consumers increasingly have information and access to the same products and brands wherever they live. This greater demand-side transparency is putting additional cost pressure on producers worldwide, and further eradicating the significance of where an OEM is actually located.

1.2.4 Fewer Trade Barriers

Not only economically but also politically, the world has changed radically in the last two decades with the fall of the Iron Curtain and the dissolution of the East/West divide. This has been accompanied by increasing the liberalization of markets that were previously inaccessible to Western companies. Russia, Eastern Europe, and China have become attractive markets and significant importers of higher-value goods.

This development is far from over, as the example of China illustrates. China has fundamentally altered its business environment in the past 15 years, liberalizing trade, improving the protection of intellectual property, and eliminating export quotas and demands for local content.

India as an emerging economic power is also wooing companies with lucrative prospects in the competition between global locations. In 1997, India launched an initiative to reduce taxes and tariffs, improve its infrastructure, and reduce subsidies. On March 31, 2001, it lifted its last volume-based restrictions on imported goods and reduced its top tariff rate.

However, deregulation has not yet progressed very far in some arenas. In India, for example, direct investments from abroad are still regulated. Foreign investors are only permitted to have minority interests in some sectors, such as cellular telephony provision, banking, and insurance.[11] The intention behind this is to protect national companies from tough international competition.

This also applies to China, where the level of state control is heavily dependent on the specific industry (Figure 1.9). Competition is artificially restricted, preventing local manufacturers from being subjected to price pressure in many sectors. The customer pays the price. A very small number of foreign automotive manufacturers and their local joint venture partners were able to enjoy four times the margins achievable in the rest of the world there until the late 1990s. Chinese customers paid significantly more for the same automobiles than buyers in Europe and the United States.

In addition to the unilateral abolition of regulations, state trade barriers are being dismantled all over the world. Customs duties have historically been a significant source of government income. It was widely accepted, however, that they hampered the international exchange of goods. In the last few decades, the perception gradually seeped through that global trade brings more advantages to a national economy and thus the government than high customs duties. The continuous reduction of tariffs began. The basis was the GATT framework. The first was concluded in 1947. By 1994, tariffs and other trade barriers had been reduced step by step to one-fifth of their original value (Table 1.2).

The outcome of the last GATT round, the Uruguay Round, was the Marrakech Declaration that founded the World Trade Organization (WTO). The WTO commenced work in 1995. The WTO continues to apply the regulations developed under the GATT framework and further the reductions in tariffs and other trade barriers under the umbrella of the Multilateral Trade Agreement.

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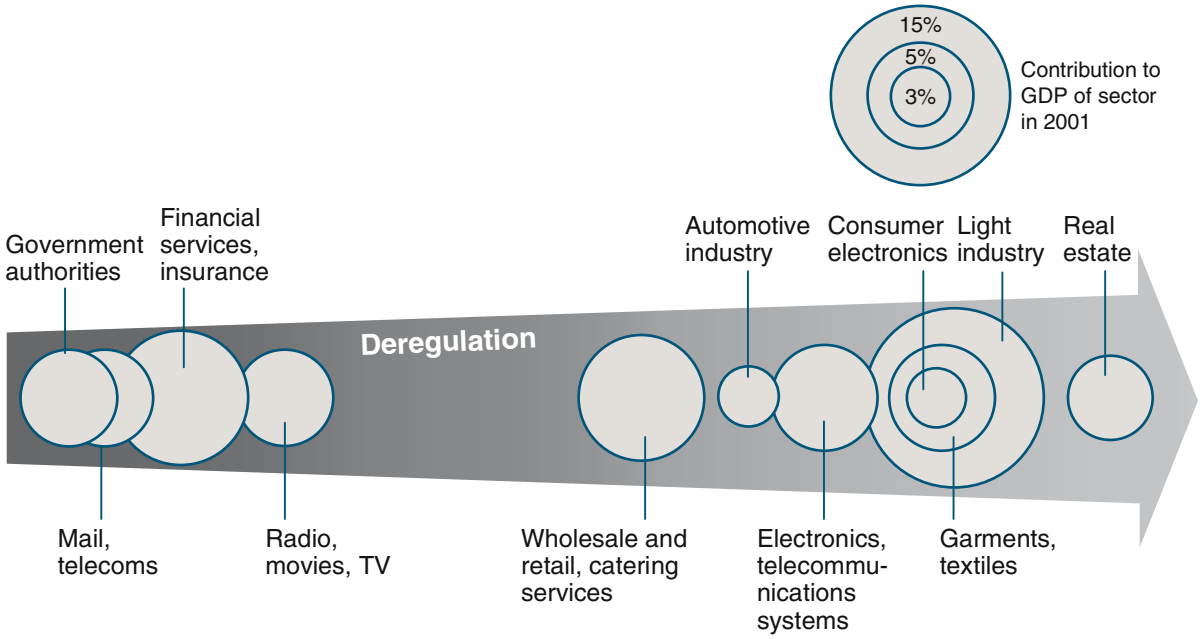
[11] *See EIU (2007), p. 18.*

Deregulation has not yet penetrated all sectors of industry in China

Fig. 1.9: Liberaliziation of the Chinese market by industry



State controlled
- No foreign investments permitted
- Limited or no competition
- High state involvement

Open market
- Accessible to foreign investments
- Unrestricted competition
- Limited state involvement

Source: China today (2004)

Table 1.2: GATT rounds and the corresponding tariff reductions

	Year	Tariff reduction	Index
			100%
Geneva	1947	19%	81%
Annecy	1949	2%	79%
Tournay	1950/51	3%	77%
Geneva	1955/56	2%	75%
Dillon Round	1961/62	7%	70%
Kennedy Round	1964 - 67	35%	46%
Tokyo Round	1973 - 79	34%	30%
Uruguay Round	1986 - 94	40%	18%

Reduced to 18% of pre-1947 tariff level

Regional economic alliances create a favorable climate for investment – a win-win for all participants

In parallel, many states came together to form economic areas during the 20th century. These alliances all aim to create a win-win situation for the member states. Companies in the member states gain better access to a larger market and are thereby able to realize economies of scale from higher production volumes. Thus free trade can lead to an improved use of resources, i.e., higher productivity and more competition. Higher productivity allows for higher wages and thus can stimulate demand whereas it also furthers the cost-efficient supply of goods.

The links forged range from pure free trade zones through customs unions (with zero tariffs on the movement of goods within the union and standard import tariffs for non-member countries) to fully integrated economic zones with a joint currency. These associations change legacy structures and have a substantial impact on the globalization choices of multinationals.

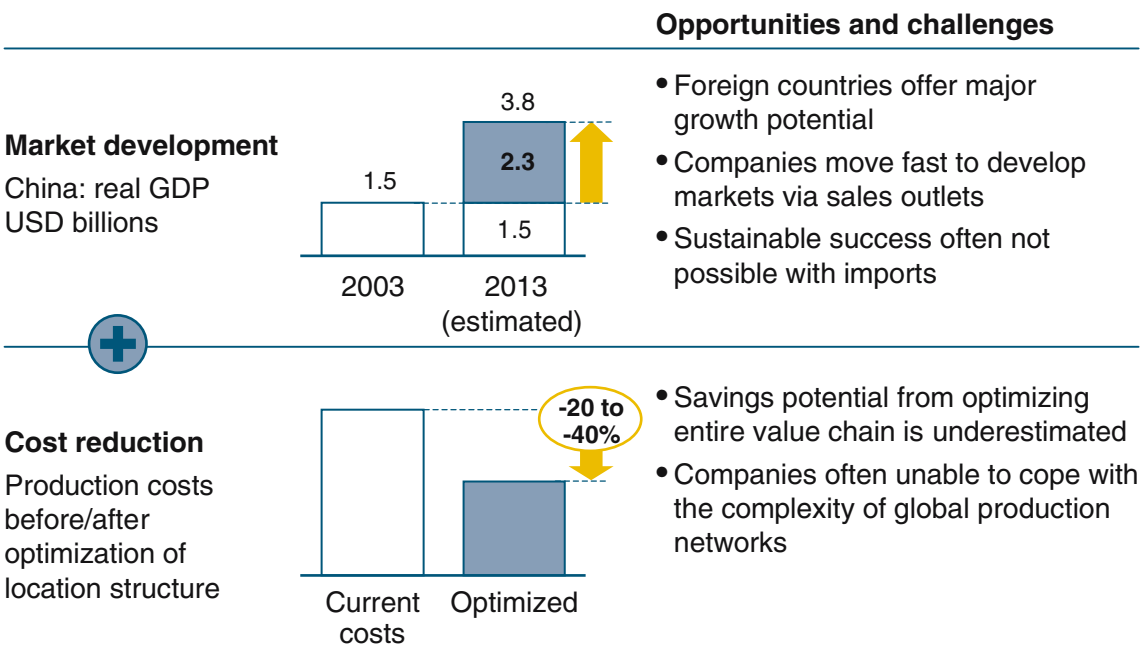
1.3 Goals of Global Production

Market development and cost reduction are generally the main motives when companies set their sights on globalization. Further reasons include the low-cost sourcing of supplied parts, high-grade knowledge and qualifications, and avoiding business risks such as exchange rate fluctuation. These secondary motives normally play a part in globalization decisions in conjunction with one of the two main aims (Figure 1.10).

Companies will choose different approaches depending on their key motivation. If they mainly wish to gain new customers in other countries, they will globalize by setting up new sales offices and strengthen-

Global production offers major opportunities, but also challenges

Fig. 1.10: The two key drivers of global production: new markets and cost reduction

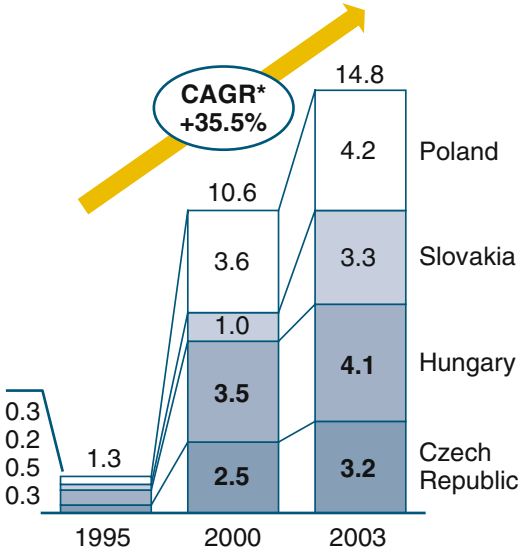


Source: McKinsey

Eastern Europe is developing into the key foreign location for German automotive suppliers

Fig. 1.11: Recent trends in production abroad

Automotive supply industry: imports to Germany
EUR billions



* Compound annual growth rate

Source: McKinsey/PTW (ProNet analysis)

No. of staff of selected suppliers in new member countries of the EU

Poland	Bosch	500	Faurecia	3,154
	Delphi	6,039	Valeo	4,600
	Leoni	1,600	TRW	2,800
	Mahle	1,300	Autoliv	1,176
Slovakia	Beru	110	FAG Kugel-	
	Bosch	1,500	fischer	650
	ContiTech	500	Knorr-Bremse	1,200
	Delphi	1,970	Leoni	1,190
	Eissmann	390	Veritas	700
Hungary	Autoliv	840	Lear	
	Bosch	3,300	Corporation	5,068
	Continental	1,127	LUK	650
	Delphi	2,100	Michelin	2,100
	Denso	2,530	Valeo	700
	Knorr-Bremse	800	Visteon	1,200
Czech Republic	Autopal	4,415	Hella	700
	Behr	650	Johnson Control	2,900
	Bosch	6,500	Knorr-Bremse	310
	Brose	1,000	Magneton	850
	Continental	1,800	Mann+Hummel	630
	Denso	1,600	Pal	450
	Eberspächer	250	Safina	330
	Edscha	300	TRW	2,962
	Federal-Mogul	900	VDO	1,900
	Hayes Lemmerz	410		

ing their local customer services. Occasionally they will open up production locations to support their market drive by responding promptly to customer requirements and gaining competence in manufacturing tailored products. If, however, they are primarily looking to reduce manufacturing costs in existing markets, multinationals will primarily invest in machinery and plant in LCCs,[12] or shift existing factories to the new location.

Market attractiveness has been the key reason for expansion to North America and Asia so far, while cost-cutting has been the primary attraction with Eastern Europe (Table 1.3). This is borne out by the strong growth in imports. Imports of automotive parts from Eastern Europe to Germany have risen by over 30 percent on average in the last decade (Figure 1.11, left). Other indications of the draw of Eastern Europe are the many branches of Western suppliers with increasing numbers of staff (Figure 1.11, right).

1.3.1 The Growth Impact

It used to be that companies could grow in new markets "just" by expanding local sales and service capabilities. This is no longer true. The consensus is that production in new markets can be an important component of tapping into these markets. One reason is the transaction costs for imported products,

[12] *LCC refers throughout this book to low-cost countries. We define low-cost countries and low-cost locations as geographies with average gross wages for blue-collar workers at or below USD 5 per working hour. The other boundary conditions apply as for high-cost locations.*

Table 1.3: Reasons for the attractiveness of countries or groups of countries[13]

Region	Reason for attractiveness (percent)			Mentions (absolute)
	Market	Costs	Other[2]	
China/India	**52**	32	16	87
Eastern Europe (EU)	13	**59**	28	36
Other[1]	26	40	34	75

[1] *Brazil, the Philippines, Romania, Thailand (each mentioned three times), and others.*
[2] *Mentioned in questionnaire: "know-how" and "other."*

which make them too expensive. Another is that products cannot be adapted flexibly enough to local market needs. The **gain in image and trust** vis-à-vis the customer from local manufacturing is a further important argument. Another is the elimination of state regulation imposed on imported products.

Interviews during the ProNet corporate survey showed how important "soft" factors in the business context are for success in developing countries.

Local production often makes it easier to open up a new market

Even with capital goods such as machinery and plant, decision makers know local presence can become the anchor of a firm's success. These are not just hard facts like easier maintenance, and availability of spare parts. Fuzzier indicators of customer perception are also important: confidence in long-term flexibility, reliability, and the intensity and quality of customer care. Customers develop greater trust because competent contacts – including production staff – are always on site. They can count on fast reactions and short lines of communication, knowing the personnel speak their language (both literally and metaphorically).

Western companies are therefore increasingly setting up their own production facilities even for sales-oriented foreign activities. This applies particularly in Asia, because of the great distance, the high state barriers, and cultural differences. The early commitment of Volkswagen in China is a good example. By establishing a Chinese plant long before the "rush to Asia," Volkswagen managed to secure a dominant market position in the most highly populated country in the world that lasted many years (see box: "China and India – Attractive Markets if Approached Right").

For many customers, however, the connection between a brand and its nationality has intrinsic value. Porsche Director Michael Macht stated that Americans are prepared to pay EUR 1,500 more for a top car "Made in Germany."[14] There, and for that product, local production would not necessarily be the key to success. The story is different for EADS, the Airbus aircraft manufacturer. Production on site and a US image is key to success in the US aerospace market. This is also a reason why EADS focuses intensely on building activities in the US. According to an EADS spokesman, "We can only be successful if we are accepted in the US as an American company."[17] Experience shows that local presence and the link between brand and nationality often pose a conundrum.

1.3.2 The Cost Impact

Cost advantages are driving ever more companies to set up production at new locations. The decision on where to locate production operations should be based on evaluation of the parameters outlined in Chapters 2, 3, and 4. The calculation must include the total landed costs, i.e., total production and transaction costs for the entire productive value chain.

[13] *Cf. results of ProNet survey.*
[14] *http://www.staufen-akademie.de/michael_macht.html*

China and India – Attractive Markets if Approached Right

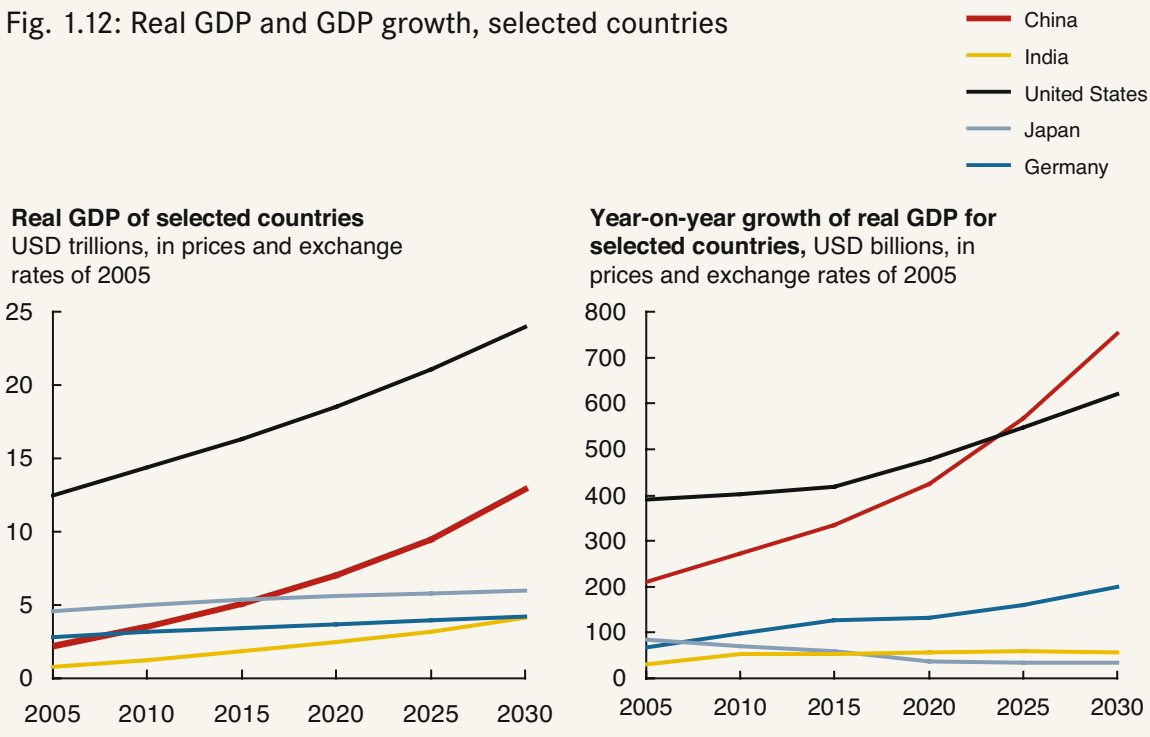
Emerging markets, particularly China, have received major attention from MNCs over the last few decades, with India moving into the spotlight more recently. Both countries share three key characteristics: GDP is soaring, their populations are very large (and thus the number of potential consumers), and factor costs – especially labor – are a fraction of those in developed countries. However, to conclude that these markets are an MNC's paradise would be overly simplistic.

If GDP is used as a measure for a country's wealth, it is true that China and India are experiencing significantly higher growth rates than developed countries. In the time frame between 2005 and 2030, expected average annual real growth rates for China and India are about 6 to 9 percent, versus 2 to 3 percent for the United States, and only 1 to 3 percent for Japan and Western European countries.[15] Looking at absolute annual GDP growth, the incremental growth in China is already higher today than in Japan and Germany, and India has just surpassed these two countries as well. Nonetheless, it will still take until about 2016 for China's GDP to outgrow Japan's, and until about 2030 for India's GDP to exceed Germany's. US GDP will still remain by far the highest of all countries. Absolute GDP growth in China will match that of the US in around 15 years (Figure 1.12).

Looking at markets rather than the size of integrated economies, the potential in emerging markets is indeed impressive. A good example is the

In terms of absolute growth of real GDP, China will overtake the US around 2024

Fig. 1.12: Real GDP and GDP growth, selected countries



Source: Global Insight (World Market Monitor, 2007)

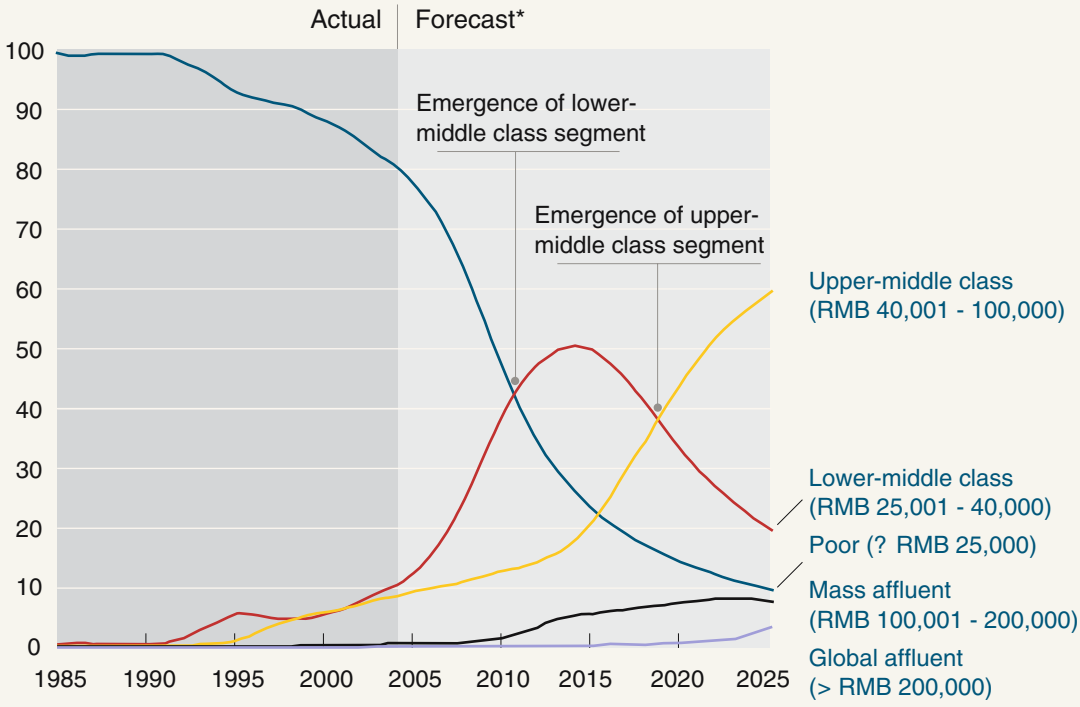
[15] *Source: Global Insight, World Development Indicators (World Bank)*

development of urban consumers in China. A model developed by the McKinsey Global Institute divides the key emerging middle class into a lower segment with an income of RMB 25,000 – 40,000, and an upper segment with an income of RMB 40,000 - 100,000. While the nominal currency ratio is about RMB 8 for USD 1, the different price levels create a ratio of buying power of about RMB 2 to USD 1, i.e., a Chinese household income of RMB 100,000 has similar buying power to a US household with an income of about USD 50,000. Development in China will take place in two phases. During the first wave (currently ongoing), we will see the rise of the lower-middle class reach a peak in 2009 with about 270 million consumers, about 43 percent of China's urban population. A second transition will follow in the next decade with a staggering increase in the upper-middle class. By 2025 this group will number 475 million, about 60 percent of China's projected urban population, with a disposable income of some RMB 12 trillion (Figure 1.13).

In approaching these markets, it is important to truly understand them. The tier-1 cities – Shanghai, Beijing, Guangzhou, and Shenzen – have the highest income level, at least 50 percent higher than the rest of China. However, China's rising middle class is widely dispersed, spread across some 650 cities and 10,000 towns. In addition to spending power, attitudes and behaviors also vary significantly both between the mega-cities and smaller towns as well as across the towns themselves.

The emergence of a middle class

Fig. 1.13: Share of urban households by income class in China
Percent



* Base case forecast, Q1 2006

Source: National Bureau of Statistics of China, McKinsey Global Institute analysis

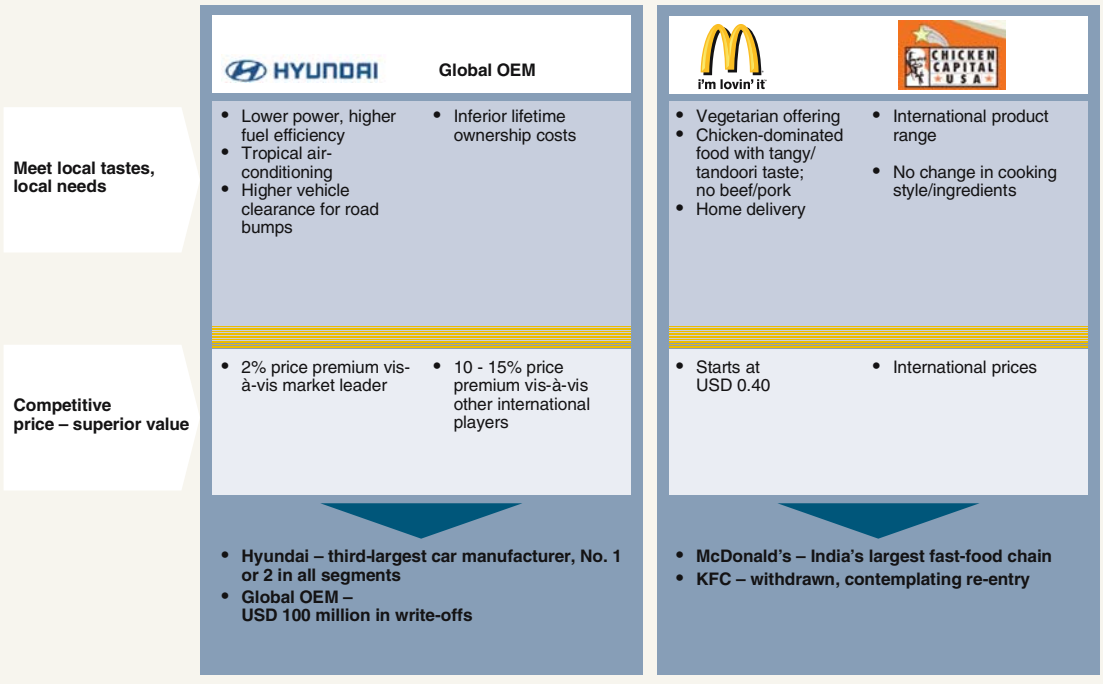
The need for MNCs to adapt their range and pricing to local markets is always critical – and India has seen its share of success stories as well as failures recently (Figure 1.14). Hyundai has developed a clear competitive edge with a range specially tailored to the market. It offers lower power, fuel-efficient engines, tropical air conditioning, and higher vehicle clearance for road bumps. With this tailoring, it has achieved a 2 percent price premium over the local market leader, capturing significant volume as the third-largest car maker. Another major global OEM nose-dived offering a range with inferior lifetime ownership costs and a 10 to 15 percent price premium, resulting in a recent write-off of USD 100 million. McDonald's is another name in the "How to do it right" category. Offering vegetarian food as well as chicken products with a tangy, tandoori flavor, its local market prices start at just 40 US cents. McDonald's has become India's largest fast-food chain. KFC (formerly Kentucky Fried Chicken) entered the market with its international product range and international prices, and failed to make the grade. It has since withdrawn.

In addition to the market strategy challenge, MNC operations in emerging markets often pose major challenges. Local players frequently benefit from their home advantage by producing outside the major cities, where labor costs are much lower. This puts heavy pressure on MNC prices and margins.

Another issue, particularly in China, is the country's reluctance to enforce the protection of intellectual property. In the ProNet corporate survey, a

"Indianize" the product and get the price-value equation right

Fig. 1.14: Global winners and also-rans in India
FY 2003



Source: McKinsey

machine tool manufacturer reported: "The Chinese started to copy our work practically during construction. They bought the same machinery and then poached our labor force six months after the start of production. We definitely won't be returning." Another manufacturer's experience of his employees' "dedication" also highlights the hardships of doing business in China: "… a short time later we found staff continuing to work at night … and selling the results to line their own pockets."

Bottom line: China and India are vast markets. They need to be on every MNC's radar. However, any approach towards the market and local operations needs to be planned and executed with painstaking care and foresight.

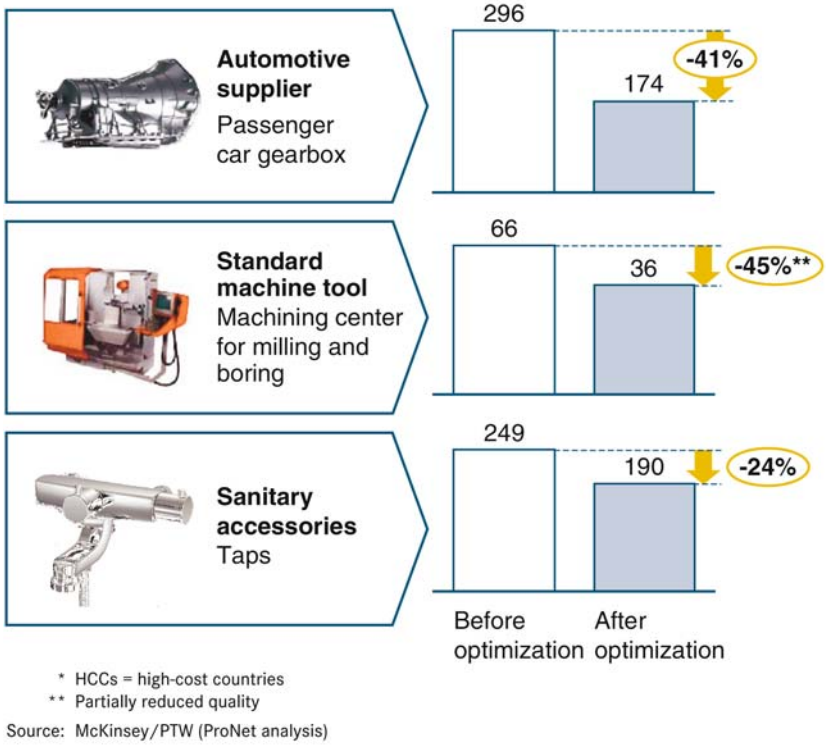
Many companies have managed to save costs and reduce competitive pressure by creating intelligently linked production networks. Good examples of this are the automotive supply companies' manufacturing facilities in Eastern Europe or the textile industry's relocation of production to Asia.

Companies can only survive long term by fundamentally redesigning their production networks

Particularly effective savings levers are, of course, the lower factor and materials costs, particularly wage and energy costs, but also savings in investment ex-

Cost savings of between 20 and 45 percent can normally be captured from optimizing production networks

Fig. 1.15: Production network optimization by incumbents based in HCCs*
Total landed costs, EUR millions p.a.



* HCCs = high-cost countries
** Partially reduced quality
Source: McKinsey/PTW (ProNet analysis)

penditure due to subsidies and tax benefits available in low-cost countries. The dominant cost lever depends to a large extent on the company's current position. Numerous projects have shown that the savings potential is generally substantial (Figure 1.15).

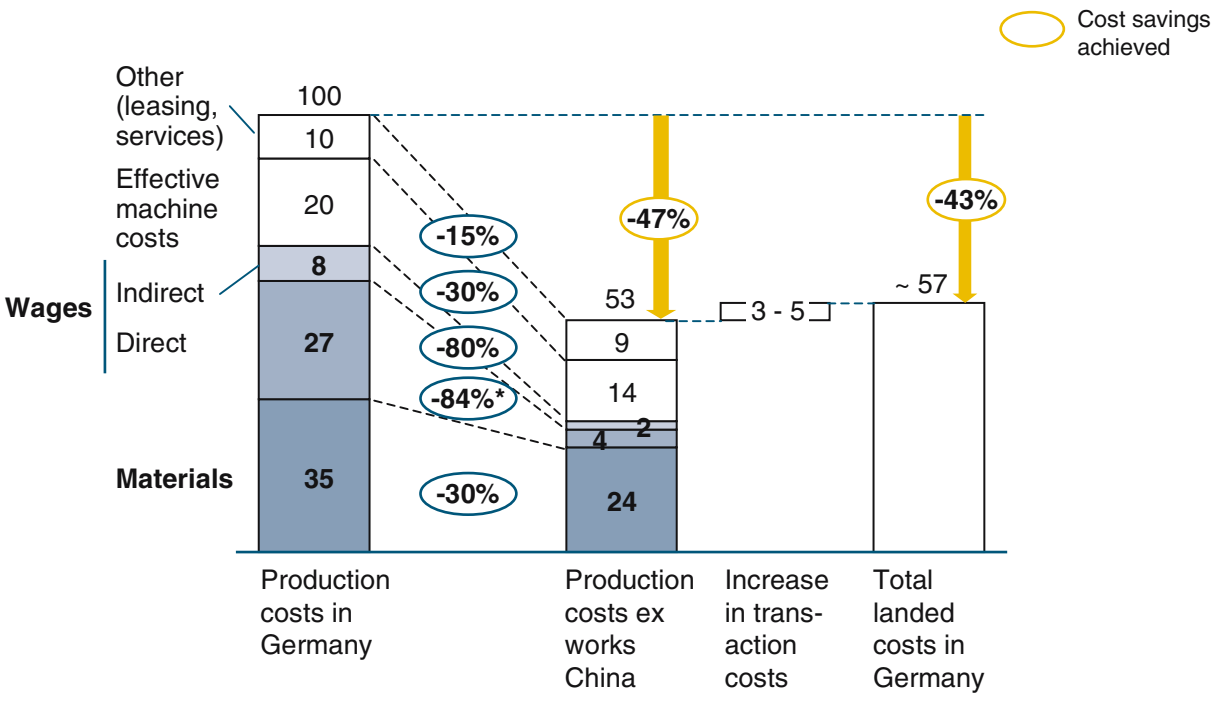
Just how high the savings can be is exemplified by a safety valve manufacturer that decided to set up a second plant in China to supply the local market (Figure 1.16). The cost advantages were so great that the works manager suggested even supplying the European market from China shortly after the start of production, and received approval. The transfer price set was 57 percent of the manufacturing costs in Germany.

The cost savings potential from globalization can be both opportunity and threat. Any company that wants full capacity utilization for expensive, state-of-the-art production facilities needs world-class sales volumes. Competitors who can capture market shares without expensive machinery and plant by tapping the cost advantages of globalization can threaten the economic viability of expensive production facilities for an entire segment. Companies too slow off the mark in this new constellation may find themselves without a future, as the fate of many laggards in Europe has shown.

Grundig, formerly a renowned brand in audio and video consumer electronics, failed to reshape its production network to make it more competitive for over a decade. Although the company had production facilities outside its German home base, these locations were not suited to balancing out structural disadvantages. As a result, Grundig was eventually forced into insolvency (see box: "The Grundig Example"). Rover – still one of the largest automotive

Main cost savings come from wage and materials costs

Fig. 1.16: Example: new foreign plant for safety valves in China
Percent



* Gross wages per worker: Germany EUR 54,000, China EUR 9,000

Source: McKinsey/PTW (ProNet analysis)

manufacturers in the world after World War II – could not keep pace with competitors for a similar reason, and went bankrupt in 2005 after a protracted decline. Sewing machine manufacturer Pfaff also failed to read the signs of the times.[15] Its production network is no longer a match for the challenges presented by new competitors from the emerging countries of Asia. The company shrank dramatically between 1981 and 2003; the number of staff fell from 9,539 to 863. Although it has meanwhile established operations in China, it remains a company with only around 1,000 employees.

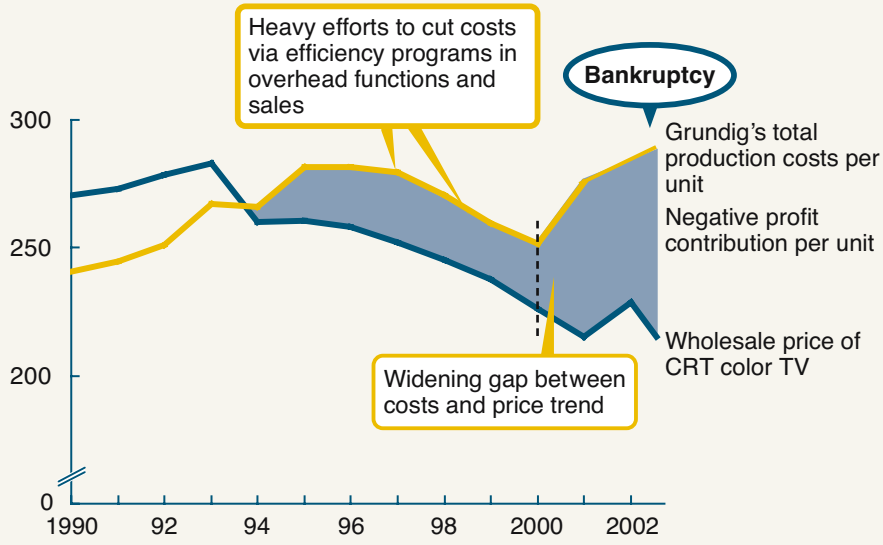
The Grundig Example

With over 38,000 employees, Grundig was a renowned manufacturer of consumer electronics products at the end of the 1980s. A symbol of the German economic miracle, the company made its name selling televisions, razors, and electronic office equipment. At the start of the 1990s, the competitive landscape altered dramatically and rapidly (Figure 1.17). New brands invaded the market – impressing buyers thanks especially to their low prices. The new providers produced at low cost, mainly in Korea, Taiwan, and Turkey initially, and later in China. Grundig, on the other hand, manufactured its appliances in Germany, Austria, France, and Spain – a large proportion of them at its home factory in Nuremberg, Germany.

Grundig had a good name and enjoyed a high market share, especially in Germany and Austria. It

Grundig was unable to close the structural gap versus competitors

Fig. 1.17: Grundig's price/costs gap over time
EUR per unit*



* Normed to color TV with standard cathode ray tube

Source: Annual reports, Reeds Electronics Yearbooks, McKinsey/PTW (ProNet analysis)

[15] *Cf. Zirbik (2003).*

did not see any pressing need to take action. But the situation rapidly grew more acute. The new manufacturers were gaining in experience, raising the quality of their products and increasing their cost advantage with improved processes. Between 1990 and 2004, the average price of comparable TVs fell by 2 percent each year. As other manufacturers pressed forward with the relocation of their production to low-cost countries, the price decline accelerated. This development found Grundig in a phase of increasing production costs. The company tried to keep up via additional investments in automation, but the gap between market price and Grundig's cost of goods manufactured continued to grow.

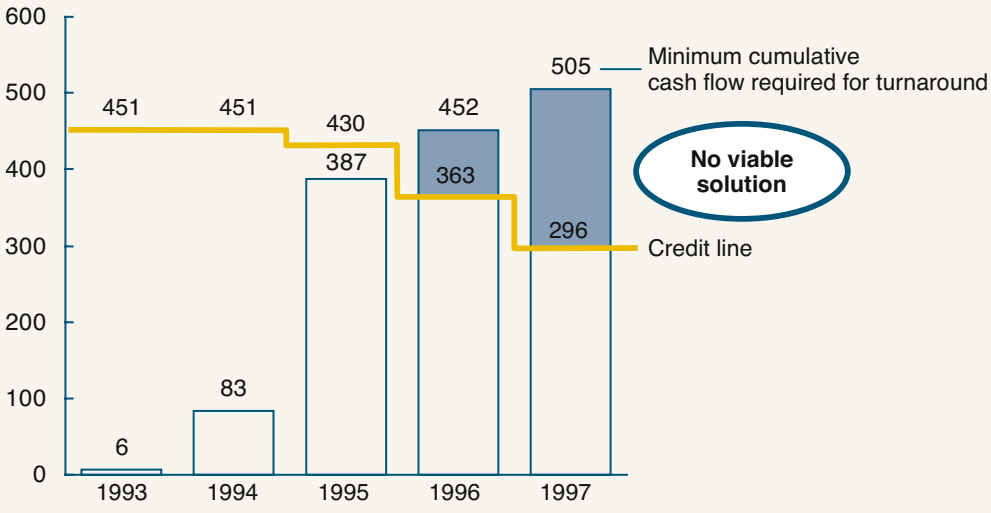
Grundig invested in cost-cutting initiatives and managed to achieve improvement rates comparable to those of other manufacturers. But the gap remained constant: costs were still higher than the prices it could charge. By now, other manufacturers had cast off the image of low-quality, cut-price providers. Grundig's share of the market was dwindling.

In response, Grundig started restructuring its own production: television assembly was discontinued in France (1992) and Spain (1993). The main factories remaining in operation were in Vienna, Austria and Nuremberg, Germany. However, this pullback did not lead to the necessary cost reductions either. In 2002, Grundig filed for bankruptcy.

An analysis of the options open to Grundig based on the annual accounts of the previous decade reveals that the company was last in a position to save itself in 1995. The funds required for restructuring and setting up new production sites were no longer available the following year – six years before the company went bankrupt (Figure 1.18). Once Grundig had fallen below the minimum liquidity limit, it could no longer be saved

The cumulative spending on relocation would have exceeded the credit line from 1996 onwards

Fig. 1.18: Credit line vs. cash-out required for the restructuring of Grundig
EUR millions



Source: Grundig annual reports, McKinsey/PTW (ProNet analysis)

without raising additional equity capital. The company's hesitation had led to a point of no return.

If this development is compared with that of other manufacturers in similar situations, one can see what might have saved Grundig: relocating production to leverage factor cost advantages.

Grundig's rival Thomson was in a similarly precarious position in 1992, but rigorously implemented a program of dramatic countermeasures. In 1996, around 80 percent of Thomson's production was in high-cost locations, but just two years later the figure was only 40 percent and falling. The company has been back in the profit zone again after 1998. The toughness gained by the organization in the "manufacturing crisis" may also enable Thomson to successfully master the current difficulties.

Bottom line: Failure to take prompt action can jeopardize a company's existence. Reorganizing a production network when you are already weakened is much harder than being proactive and doing so before cash and credit line reserves are prohibitively low for a broad relocation of assets to lower-cost regions.

1.3.3 Secondary Objectives: Tapping Resources and Minimizing Risks

Access to tangible and intangible resources and the reduction of risk are examples of secondary motives that also have a major influence on the decision to go global. The term "resources" covers a wide range of factors: being close to raw materials suppliers, to the industry focus, or to technology leaders. Risk reduction includes protection against currency exposure, supply bottlenecks, and production stoppages, and also special terms offered by some states, such as direct investment subsidies and tax benefits.

1.3.3.1 Resource Access

Where tangible resources are concerned, relocating production close to the source of low-cost input products can often yield great advantages. This applies, for example, to the manufacture of metal-based products in Russia. The local availability of metal ores eliminates costs for long-distance transportation, and low labor costs are a boon both for converting ore into metal and for producing intermediate products.

MNCs find emerging nations' low labor costs and high growth extremely attractive

At the same time, incumbents pursuing smart global labor strategies are finding promising talent growth in emerging nations, too. At 33 million, developing countries have more than twice the number of university-educated young professionals that developed countries do, and they can be tapped in a win-win situation for employer and employee provided multinationals install the right training and staff retention policies.

Access to intangible resources implies location close to centers of know-how in a company's industry. Companies benefit from technical and country-specific knowledge transfer and from the availability of qualified, low-cost personnel on site. When staff with specialized training are needed for low-volume production, which is often the case, companies can gain clear advantages from choosing locations where staff already have the know-how to manufacture their products efficiently. The best case is a "hat trick" or triple play: a setup that allows a company to develop products close to production, close to the market, and with a fast ramp-up.

An area with a concentration of one type of industry and a great deal of the related know-how is known as a **cluster**. Clusters act as focused pools of resources and ideas that amplify a continuous stream of innovation. Having a production site in the cluster enables companies to swiftly translate innovations into products, and is often essential if they wish to tap this know-how and play a leading industry

role. These are often called lead plants or NPI (New Product Introduction) facilities. Particularly in industries where products are highly standardized for global sales, e.g., electronics, it is common to have an NPI in a facility near the R&D center, with rapid deployment to the other production sites, including those of external contract manufacturers. Well-known examples of effective industry clusters are Silicon Valley for semiconductors, "Mainboard Road" in Taiwan, or China's electrical and electronics manufacturing cluster around Shenzhen. They are also critical in emerging industries. Several centers of technology in France, Sweden, and Germany are trying to enhance their industrial growth by establishing explicit clusters around the new European Galileo satellite navigation system. Participation in the relevant clusters is critical for companies that want to play in the top league.

"More Art than Science" – Extract from an Interview on Clusters with Professor Porter

Michael E. Porter, Professor at Harvard Business School, is considered one of the world's greatest experts on competitive strategy and international competitiveness. How can regions and countries sustain and promote growth, innovativeness, and employment? Originally an aviation engineer, Professor Porter has been focusing on these central issues throughout his career.

Professor Porter, what are clusters, and why are they important for the competitiveness of an economy?
Clusters are a spatial organizational form for industry that generates greater productivity and innovation than more physically disparate structures. In a cluster, a variety of businesses and associated entities important to competition are gathered together in a relatively small area: manufacturers, suppliers, service providers, universities, and other training institutes.

What impact does a cluster have?
A cluster influences the market in three ways. First, it creates greater efficiency. Transactions can take place without high costs for logistics or transportation. Lines of communication are shorter, market participants can respond to one another faster. Clusters also produce goods that firms within the cluster can obtain relatively favorably. Anyone working outside the region has to conduct transactions and pay to access them. Skilled staff in a specific sector are a good example. You can simply hire them, they'll move from one enterprise to another. Anywhere else, you'd have to train them first. This applies to a whole range of inputs: labor, market knowledge, technology. In a cluster they virtually become public goods to which everyone has access.

Second, opportunities drive innovation. If a large number of companies and market participants are concentrated in a small space, it is easier to detect gaps in the market. New goods or services seem to emerge all the more readily, the appropriate technical expertise is at your feet. You can also commercialize opportunities faster. All the elements of the value creation process, from the idea through to the product, can be combined in an instant. A cluster also provides better access to capital. Financial institutions that work with a cluster have sector-specific experience – from wine-growing to automotive production – and can make faster and better venture capital decisions.

Third, clusters stimulate new businesses in their field. The thresholds to market entry are lower for the reasons I've just described. It is easier to raise capital, access key suppliers, and find customers.

Source: "Mehr Kunst als Wissenschaft" by Steffan Heuer in McK Wissen 01 (2002)

1.3.3.2 Risk Reduction

A further important goal of location planning is to **minimize risks**. One way to reduce risks lies in spreading them through **diversification**. Having plants in various countries can balance out production outages in the event of political and social unrest, terrorist threats, or war, which mostly affect only one location. Diversification is also an advantage in dealing with everyday risks, such as currency fluctuations, which can threaten a company's survival.

If a company's costs are primarily incurred in the eurozone (because it has only one production location – Europe), and its sales are chiefly earned in the US dollar zone, a change in the exchange rate will have a direct impact on the company's profits. In the past five years alone, the euro/dollar exchange rate has seen swings of 40 percent. No manufacturer has that high a margin. Without countermeasures such as hedging,[16] this inevitably leads to periods of extreme losses.

Corporations can hedge on the financial markets. However, the more obvious course of action is to eliminate the imbalance via operational hedging – by aligning the currency structure of costs with the currency structure of sales. In the example above, a balance could be achieved by purchasing more parts in the dollar area, or by adding value (i.e., producing) there. Having similar currency structures eliminates the risk of exchange rate fluctuations. With global sales, global production is an obvious solution.

Companies can also use diversification to reduce sourcing risks, by using several suppliers. Depending on one supplier or even one production site only can cause severe problems and bring entire production networks to a standstill should the supplier face any number of challenges. This may happen for quality reasons or due to issues in the parts logistics. Another example of risk due to lack of operational hedging is the case of the Sony factory producing high-performance batteries for mobile phones. After a major fire in the plant in the mid-1990s, the plant ceased to supply the units for Sony and Siemens, seriously hampering sales in a critical phase of the exploding mobile handset market.

1.4 Current Production Networks of the Three ProNet Focus Industries

The three focal industries of this book – automotive engineering, electrical and electronics, and machine tool manufacturing – have widely differing cost structures (Figure 1.19). Almost 70 percent of the cost base of an automotive OEM are for materials and supplied parts. These items account for over 50 percent of costs in the electrical and electronics industry, but less than half in machine tool manufacturing. Since labor costs represent a relatively large cost factor in the latter, the cost pressure on in-house production is all the more intense. This explains why two-thirds of machine tool manufacturing companies – more than in the other two industries – produce abroad largely for cost reasons.

Most current production networks have a legacy structure, without any strategic planning

Interestingly, both machine tool manufacturing and automotive engineering appear to be fairly successful in high-cost locations, as indicated by their high share of exports and especially their high net export surplus.[17] The numbers tell a different story in the electrical and electronics industry. Although this industry exports a significant share of its output, the share of high-tech products imported by high-cost countries is also high, sometimes making the import-export balance a zero-sum game. The position and behavior of HCC-based companies in the electrical and electronics industry are therefore quite

[16] *Hedging safeguards a transaction against risks such as exchange rate fluctuations or changes in raw materials prices. The person or company wishing to hedge a transaction enters into a second transaction linked with the underlying one. This normally takes the form of a forward transaction.*

[17] *The net export surplus shows how many percent more of the production value is produced than consumed in a particular country.*

different from in the automotive or machine tool sectors, as the following profiles show.

1.4.1 Automotive Industry

While automotive mass production has its origins in North America, all three US OEMs are struggling. Global markets are dominated by European and Japanese players.

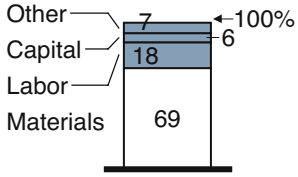
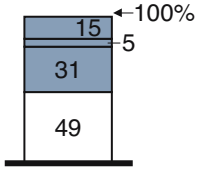
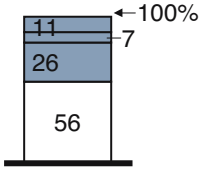
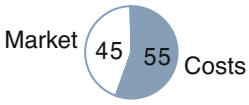
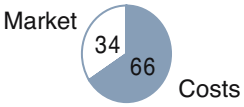
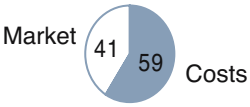
The successful globalization strategies of automakers can be divided into two classes, based on the nature of their product orientation (loosely termed "premium" and "value"). Illustrating the premium product strategy, many European players have successfully leveraged their outstanding engineering skills to establish a strong position at the upper end of the market. They are realizing price premiums that allow them to maintain an engineering and production footprint largely in high-cost countries (after making massive productivity improvements during the last industry downturn). German manufacturers are particularly strong despite the very high factor costs in their home base. Both German companies and the location of Germany itself have benefited from the strong growth of the premium segment in passenger cars.

Japanese and Korean players, on the other hand, are focusing more on the lower and middle market segments, with an emphasis on value for money. As a result, they have established global manufacturing footprints that rely increasingly on low-cost production sites.

Two highly successful companies in the automotive sector illustrate the divergent manufacturing footprint

Great structural differences in the industries analyzed

Fig. 1.19: Structural indicators, three selected industries

	Automotive engineering	Machine tool manufacturing	Electrical/electronics industry
Cost structure Percent			
Reasons for producing abroad Percent of responses			
Intensity of R&D activity Percent of employees	9.5	3.1	7.0
Export share Percent	59	51	43
Net export surplus (difference between exports and imports per gross output) Percent	29	34	1
Ratio of direct investments (direct investments per gross output) from Germany : to Germany Percent	37.4 : 4.0	8.3 : 6.8	6.8 : 4.8

Source: Treier (2005), German Federal Office of Statistics (2005)

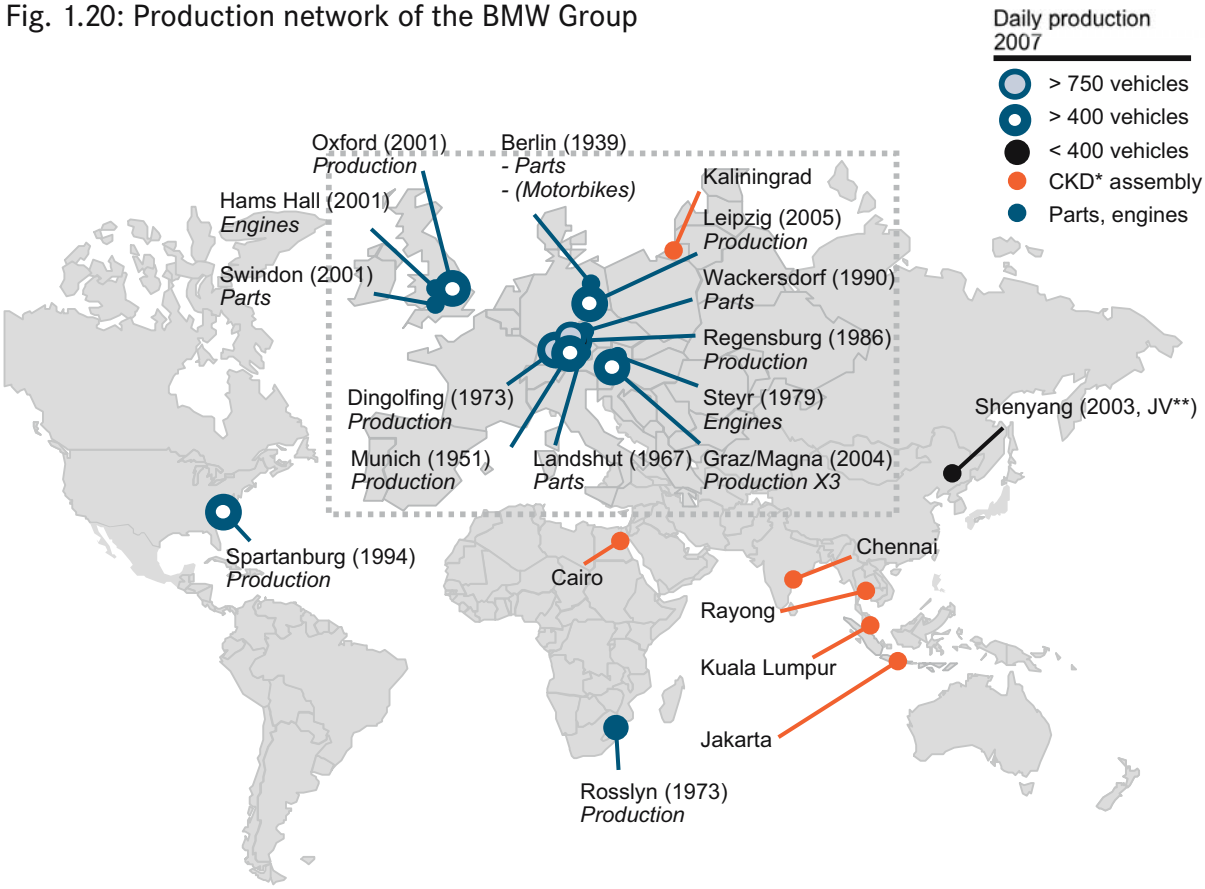
strategies well: BMW and Toyota. BMW pursues a strategy of producing its cars and critical large components such as engines mainly in high-cost locations with highly skilled labor forces. Most of its production is in Germany, Austria, and the UK (for the Mini), close to its engineering centers (Figure 1.20). The most recent addition was the new plant in Leipzig to manufacture some 3 Series cars and the new 1 Series. Beyond these, BMW has only two other manufacturing sites of note: a major plant in the US and a smaller one in South Africa. All of its other manufacturing operations are smaller joint ventures for SKD (semi-knocked down) in China and CKD (completely knocked down) car kits to gain easier access to markets such as Thailand, Malaysia, Russia, Egypt, and Indonesia.[18]

By contrast, Toyota pursues a much more international manufacturing footprint strategy. Strongly on track to become the largest global OEM, it is firmly established across all market segments, including the lower end. It also has tremendously high volumes – well over 9 million vehicles in 2007 – and growth. This positioning provides different imperatives for a broader production footprint geared to low costs (Figure 1.21).

Toyota still makes over 50 percent of its cars in its home base, Japan, where its plants are already the

BMW's vehicle assembly is particularly close to the market

Fig. 1.20: Production network of the BMW Group



* CKD = completely knocked down
** Joint Venture with Billiance

Source: BMW

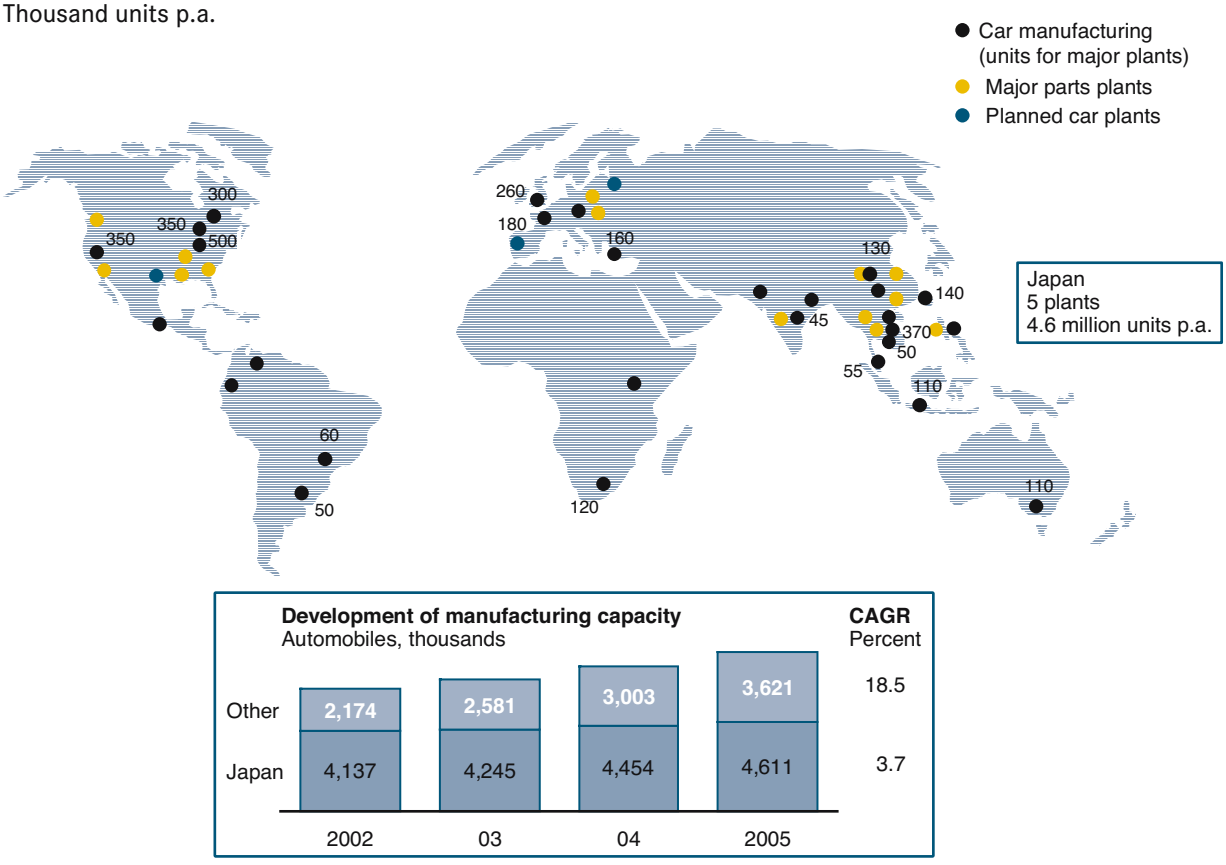
[18] *BMW Web site.*

most efficient in the world, outperforming competitor productivity by significant margins. Nonetheless, the increase in new capacity in the Toyota network to match its globally rising demand averaged around 3 percent p.a. in its Japanese plants and over 18 percent in its plants outside Japan. Its newest additions to the plant portfolio are sites in the Czech Republic, China, and Russia (planned for 2007 or 2008).[19]

To fend off the threats of lower-cost attackers, volume players based in HCCs need to rigorously improve performance along three fronts. The first and most immediate imperative is to optimize their manufacturing efficiency. Second is the ongoing drive to move additional manufacturing to low-cost locations, such as Eastern Europe. This is especially important for the growing low-cost car segment, as the success of Renault's Dacia Logan shows. Built in Romania, the Dacia Logan has plans to expand production to numerous other low-cost production sites to gain better access to new markets without compromising its low-cost position. The third imperative is to move the supply base to low-cost regions as well. Today, of the 15,000 components installed in cars made in Eastern Europe, 80 percent are imported from the West.[20] This imperative also extends to first-tier automotive suppliers, but is only truly beneficial if excess transport costs are consistently eliminated along the supply

Toyota's manufacturing footprint spans the globe

Fig. 1.21: Toyota's global presence
Thousand units p.a.



Source: Toyota Yearbook 2006

[19] *Toyota Yearbook 2006.*

[20] *Economist.com, "The big car problem," Feb 22, 2007.*

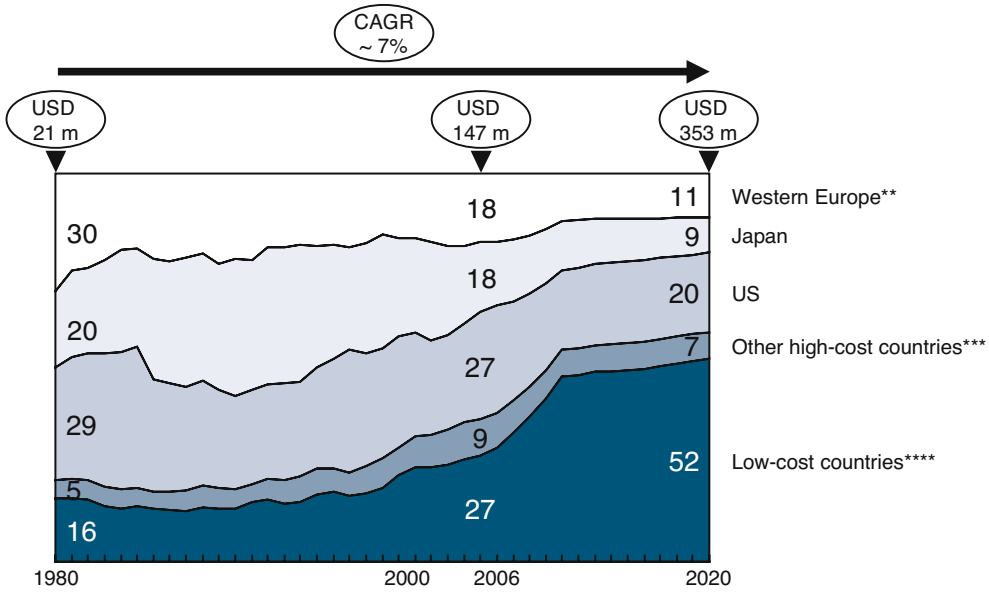
chain. In reality, this is often not the case. As the manager of an (automotive) electronics plant in Hungary reports: "The setup did not really make economic sense. We shipped 90 percent of the parts from Germany to Hungary, added about 5 percent value in manufacturing, and shipped them back to our customers in Western Europe for assembly in the vehicle."

1.4.2 Electrical and Electronics Industry

The picture in the electrical and electronics industry is very different – particularly in the growth segment of communications and consumer electronics. The share of electronics products from production in low-cost countries is growing by leaps and bounds. High-cost countries are irrevocably losing out in this field. However, to date, most of the action has concentrated on the manufacture of simple components and the assembly of end products. The distribution of global value added in this industry clearly reveals that the loss of HCC market share has occurred mainly in Europe, primarily due to competition from LCCs (Figure 1.22). The US and Japan have more or less maintained their share of value added to date. However, in the future, all high-cost countries are expected to lose significant market shares in electrical and electronics production to low-cost competitors. While these trends highlight continuing country and regional differences, the absolute size of the industry has been growing significantly in all regions due to the strong growth of the global electronics market between 1980 and 2020, which is projected to see continuous growth rates of about 7 percent p.a. over this 40-year time period.

Although some regional differences in the Triad persist, electronics production is clearly moving to low-cost countries

Fig. 1.22: Value added in electronics* by region, 1980 - 2020 (estimated)
Percent



* ISIC 3832, 3833, 3839
** Austria, Belgium, Denmark, Finland, France, Germany, Greece, Ireland, Italy, Netherlands, Norway, Portugal, Spain, Sweden, Switzerland, UK
*** Australia, Canada, Israel, New Zealand, South Korea
**** Rest of world not mentioned elsewhere

Source: Global Insight (WIM, Aug 9, 2007)

The once thriving Western European electrical and electronics industry, for example, has only preserved a global presence worth mentioning in two areas: as suppliers to the automotive industry and in electricity generation and distribution. The only way to retain (and attract) the extremely capital-intensive manufacture of semiconductors in Western Europe has been high subsidies. However, European companies have been largely driven out in the greatest growth arena of the last decade, communications and consumer electronics. They are not succeeding in developing a premium segment through innovative and high-quality products, unlike the German automotive industry. Manufacturers find they cannot compensate for the comparatively poor cost structure and are losing market shares. This has already led to subcritical unit volume for mass-market products and a barely competitive cost position, and has frequently resulted in the sale or closure of factories.

Western Europe has lost significance in almost all fields of electronics, from communications and consumer electronics, office machinery, and computer segments to electrical equipment. Analysis shows that the Western European share of value added has fallen from 30 to less than 20 percent since 1980. In the field of consumer electronics, Western Europe has retained value added almost exclusively for goods with a low value density (e.g., washing machines and driers) that are very costly to ship over large distances – and even this sector has been facing increasing competition recently from locations in Eastern Europe and Turkey.

Once a manufacturing segment in this industry is gone, it is unlikely ever to return. The only opportunity for HCCs is to leverage technological breakthroughs that redefine the rules of the game of the industry for the coming one to two decades. Unfortunately, manufacturers in Germany and other HCCs missed out on the last round of such fundamental innovations in the electronics sector – whether the development of TFT and plasma television sets, DVD and hard drive recorders, or portable MP3 players – although a considerable share of the basic ingredients for these were developed in Germany. To reestablish profitable production in high-cost locations, manufacturers in the electrical and electronics industry must find a way of minimizing the time to maturity for series production and full production ramp-up by intensifying the interaction between R&D and production.

1.4.3 Machine Tool Manufacturing

The situation in the machine tool industry is fundamentally different, though closer to that of the automotive industry. Measured against world production volume, the industry has grown nominally by an average of only 0.5 percent in the last 20 years – meaning that it has shrunk in real terms (Figure 1.23). Also, the industry is predominantly characterized by small and medium-size enterprises (SMEs). The average company employs around 160 people – compared with 863 in automotive engineering.

As the ProNet survey reveals, many companies attempted to move some of their activities to LCCs when they recognized the cost pressure and competition from emerging players. However, due to a lack of scale and limited management experience and bandwidth, these efforts were often unsuccessful. Many companies eventually retreated from their ventures abroad and refocused on their activities at home instead. In many cases, this retrenchment appears to have been successful. The market share of leading German (high-cost) manufacturers has risen in the past two decades from 17 to 25 percent[21], and their sales volume has remained about constant after adjustment for inflation. The unique value proposition of these players is their engineering expertise and mature process chain throughout the entire manufacturing process. Their operations are backed up by global service concepts, and they have succeeded in tapping attractive markets.

However, a second look reveals that this success is closely linked to that of the German automakers. In 2003, more than half of the machine tools produced

[21] *Excluding parts and accessories.*

in Germany went to the automotive industry and its suppliers. Machine tool manufacturers' sales figures correlate closely with automotive investment activities rather than reflecting structural strength and competitive advantage based on superior operational performance.

Consequently, a fast-growing competitor is increasingly threatening the position of high-cost manufacturers: China – now the world's fourth-largest producer of machine tools. Growth rates of over 20 percent per annum suggest that its role will continue to expand and pose a serious threat to the viability of incumbents.

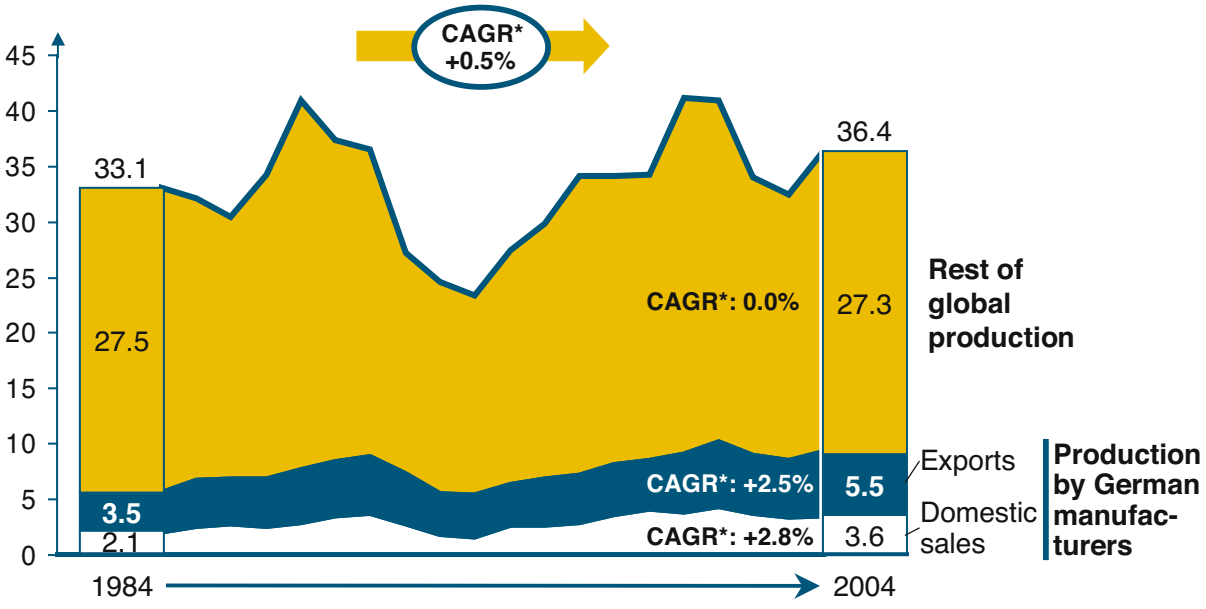
Trends in the machine tool industry give indications of future development in other sectors

The reason for this rapid development, apart from manufacturing costs, is primarily the booming Chinese market. China contributes 20 percent to world demand, making it the biggest market for machine tools. This dominance of the Chinese market, which is the leader in other industries "only" in terms of growth rates, is explained by a peculiarity of the capital goods industry: Investments are always the forerunners of future production. As a result, what is happening in machine tool manufacturing previews a development that will follow in other industries. Taiwanese and Indian machine tool manufacturers are also profiting from high domestic demand, and expanding their offerings in the standard segment.

Overall, the industry situation is problematic. Lack of growth in the market as a whole makes it difficult to simply expand the network into other countries,

Global production of machine tools is stagnating; however, Germany's market share is increasing slowly but steadily

Fig. 1.23: Nominal global production of machine tools
EUR billions, excluding parts/accessories



* Compound annual growth rate

Source: German Machine Tool Manufacturers' Association (2004)

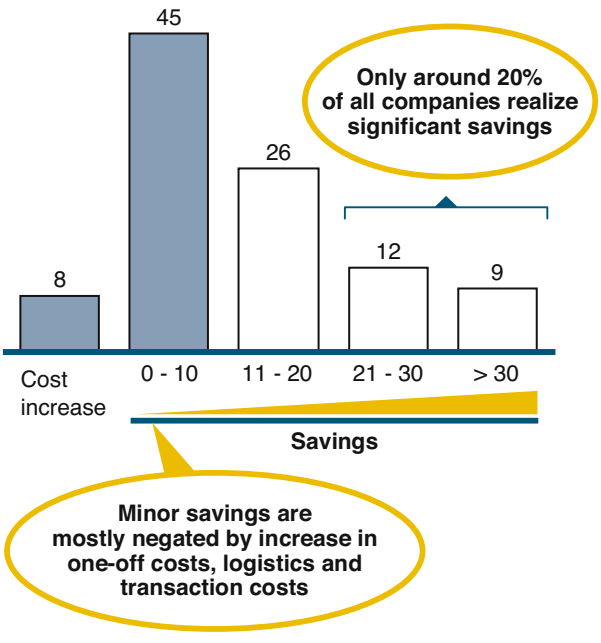
since capacity utilization at existing factories would shrink as a result. If manufacturers maintain existing structures, however, they will become exposed to new competitors from emerging nations. The only path to long-term success for European manufacturers is well-planned redesign of their production networks – especially in the standard segment. Otherwise, they risk following in the footsteps of their former peers in the electronics sector.

* * *

There are many reasons for globalizing production. Most companies are aware of the potential advantages. But how familiar are they with the challenges and hurdles? Do they know how to find the right location, minimize risks, and integrate new locations into existing structures? The relationships are complex, and the answers differ widely depending on the company.

Most companies capture less than 10 percent savings at new production sites

Fig. 1.24: Production cost savings relative to lead plant
Percent*



* Cost position of the 77 plants opened by survey participants in the previous five years across all countries

Source: McKinsey/PTW (ProNet analysis)

The ProNet survey showed that many companies fall down on the task (Figure 1.24). More than half achieve cost savings of no more than 10 percent with a new location. The reasons are numerous, spanning a lack of resources or experience in implementation, hesitant and incomplete implementation, and excessively low expectations about the savings potential.

Around 20 percent of the companies we surveyed, however, emerged as truly successful globalizers. They have managed to strike the right balance between high aspirations and realistic planning of available skills and resources. Analyzing the differences between what those 20 percent did and the other 80 percent provided us with invaluable insights into patterns that appear to yield success and pitfalls to avoid. In the remaining chapters, we will describe these findings through every area of the value chain, highlighting analyses and decisions that have helped companies to get it "right first time." Because companies only have one chance with a move as radical as footprint redesign.

Further reading

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