# THE FUTURE DIRECTION OF JAPANESE AUTOMOTIVE SUPPLIERS

by

**TSUYOSHI HOSHINO**

Bachelor of Laws, Keio University (1984)

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Signature of Author: _____
Alfred P. Sloan School of Management
May 7, 2001

Certified by: _____
Michael A. Cusumano
Sloan Management Review Distinguished Professor
Thesis Supervisor

Accepted by: _____
Stephen J. Sacca
Director, Sloan Fellows Program

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## ABSTRACT

Due to the downturn in the domestic economy and intense global competition with European and American automakers, the Japanese automotive industry has been forced to undergo rapid changes in recent years.

The changing environment of the Japanese automotive industry, including intense competition, changing market trends, globalization, alliances with American and European automakers, increasing needs for advanced vehicle technology, the move to modularization, and the breakdown of the traditional *Keiretsu* has dramatically changed the purchasing policies of automakers. It is essential that suppliers respond to these changes in order to survive, maintain, and expand their businesses in the 21st century.

This thesis analyzes the changes in purchasing policies among major Japanese automakers, based on automakers' expectations that suppliers will meet the following conditions:

1. continuous quality improvement
2. continuous cost reduction
3. optimum global purchasing
4. environment-responsive products and advanced technology
5. modularization and systemization programs.

Successful suppliers will achieve these conditions by strengthening their core competence and by reinforcing their weak points by means of strategic alliances with other companies.

Thesis Supervisor: Michael A. Cusumano
Title: Sloan Management Review Distinguished Professor

## TABLE OF CONTENTS


Page

**CHAPTER 1 INTRODUCTION** ..... **6**

**CHAPTER 2 CURRENT CONDITION IN THE JAPANESE AUTO INDUSTRY** ..... **11**
2.1 Current Trends ..... 11
2.1.1 Production Trends ..... 11
2.1.2 Sales Trends ..... 13
2.1.3 Profit Trends ..... 14
2.2 Present Condition of the Japanese Auto Parts Industry ..... 16
2.2.1 Production Trends ..... 16
2.2.2 Profit Trends ..... 18

**CHAPTER 3 THE CHANGING ENVIRONMENT IN THE JAPANESE AUTOMOTIVE INDUSTRY** ..... **23**
3.1 Competition Grows More Intense ..... 23
3.1.1 Cost Reductions ..... 24
3.1.2 Changing the Parts Business Connections ..... 24
3.1.3 Development and Design Rationalization ..... 25
3.1.4 Reorganization of Automakers ..... 25
3.1.5 Support for Multinational Management ..... 25
3.1.6 Promotion of Modularization ..... 26
3.1.7 New Technology Development ..... 26
3.2 Changing Market Trend ..... 26
3.3 Progress of Globalization ..... 30
3.4 Alliances With European and American Automakers ..... 34
3.5 Increasing Need For Advanced Vehicle Technology ..... 37
3.5.1 Environment Friendly Vehicle ..... 37
3.5.2 Intelligent Transport System ..... 39
3.6 Modularization ..... 41
3.6.1 Advantages vs. Disadvantages of Modularization for Automakers ..... 42
3.6.2 Advantages vs. Disadvantages of Modularization for Suppliers ..... 43
3.7 Breakdown of *Keiretsu* ..... 45

**CHAPTER 4 CHANGES IN MAJOR AUTOMAKERS' PURCHASING POLICIES ..... 51**
4.1 Introduction ..... 51
4.2 Purchasing Policies of Automaker A ..... 52
4.2.1 Purchasing Policies in 1996 ..... 52
4.2.2 Purchasing Policies in 1997 ..... 53
4.2.3 Purchasing Policies in 1998 ..... 54
4.2.4 Purchasing Policies in 1999 ..... 55
4.2.5 Purchasing Policies in 2000 ..... 56
4.2.6 Summary of Purchasing Policies for Automaker A ..... 57
4.3 Purchasing Policies of Automaker B ..... 57
4.3.1 Purchasing Policies in 1996 ..... 57
4.3.2 Purchasing Policies in 1997 ..... 58
4.3.3 Purchasing Policies in 1998 ..... 58
4.3.4 Purchasing Policies in 1999 ..... 59
4.3.5 Purchasing Policies in 2000 ..... 59
4.3.6 Summary of Purchasing Policies for Automaker B ..... 60
4.4 Purchasing Policies of Automaker C ..... 61
4.4.1 Purchasing Policies in 1996 ..... 61
4.4.2 Purchasing Policies in 1997 ..... 61
4.4.3 Purchasing Policies in 1998 ..... 62
4.4.4 Purchasing Policies in 1999 ..... 63
4.4.5 Purchasing Policies in 2000 ..... 64
4.4.6 Summary of Purchasing Policies for Automaker C ..... 65
4.5 Purchasing Policies of Automaker D ..... 65
4.5.1 Purchasing Policies in 1996 ..... 65
4.5.2 Purchasing Policies in 1997 ..... 66
4.5.3 Purchasing Policies in 1998 ..... 67
4.5.4 Purchasing Policies in 1999 ..... 67
4.5.5 Purchasing Policies in 2000 ..... 68
4.5.6 Summary of Purchasing Policies for Automaker D ..... 69
4.6 Commonalities in Purchasing Policies and Expectations For Suppliers ..... 69

**CHAPTER 5 FUTURE DIRECTION FOR JAPANESE AUTOMOTIVE SUPPLIERS ..... 72**
5.1 Introduction ..... 72
5.2 Strengthening Cost Competitive Power and Quality Assurance Capability ..... 73
5.3 Strengthening of R&D Power ..... 75
5.4 Modularization and Systematization ..... 76
5.5 Establishing a Global Management System ..... 78
5.6 Promoting Strategic Alliances ..... 79

**CHAPTER 6 CONCLUSION ..... 82**
**References ..... 85**

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More than ten years ago, while still in my twenties, I had two dreams. The first was to work in China, in which I have long been interested since my teenage years. The second dream was to study at a prominent business school in the United States and obtain an MBA.

I achieved my first dream by changing my job. However, I slowly abandoned my second dream as time passed until I almost forgot it. And then the unexpected happened—I was appointed by my company to attend the Sloan Fellows Program at MIT, and thus I realized my second dream at the age of forty. I am most grateful for my company's sponsorship.

It has been a difficult challenge, mentally and physically, to attend this one-year intensive MBA program. However, I can say that the pleasure of studying and acquiring new knowledge has more than exceeded the pain. Friendships with classmates and their families from all over the world will be one of my most important assets for the rest of my life. The experience this year will serve as a life-long source of spiritual nourishment

In completing this thesis, I would like to offer gratitude from the bottom of my heart to Professor Michael A. Cusumano who guided me as a supervisor.

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Tsuyoshi Hoshino
May, 2001
Wellesley, Massachusetts

# CHAPTER ONE

# INTRODUCTION

One of the major roles of the automobile industry in Japan—beyond the production and sale of cars—has been the promotion of export expansion to enhance the Japanese economy. The industry has borne this role for more than twenty years, since the oil crises of the 1970s. The source of Japan's competitive dominance in the international markets was its original supplier system, which has no similar counterpart in Western countries. That is, not only do the automakers support the competitive power of the Japanese auto industry, but so do the Japanese production systems built by automakers, suppliers and subcontractor companies.

Three fundamental features of the production system can be identified:

**1) High Subcontract Ratio**

When compared with European and American automakers, the ratio of subcontractors who do work for Japanese automakers is high, exceeding an average of 70%. For example, General Motor's in-house production ratio for automotive parts was 70% in the past, and has been reduced by 60% by spinning off its automotive parts division. European automakers' in-house production ratio for automotive parts was about 50% on average, but now it has been reduced to 40% (Ikeda, 1998, p.2).

**2) Continuous, long-term transactions with small number of first-tier suppliers**

The number of suppliers with whom Japanese automakers trade directly is approximately 200-300 (Ikeda, 1998, p.2). Thus, although the subcontract ratio is high, generally an automaker purchases finished parts from a small number of suppliers. This forms a layered type of structure, with a small number of first-tier suppliers who supply finished parts, and second- and third-tier suppliers who supply unit parts and single parts to first-tier suppliers—all using an automaker as the vertex.

In comparison, until the early 1980s, European and American automakers traded directly with a huge number of suppliers, on average more than 1000 companies (Ikeda, 1998, p.3). This is because European and American automakers did not have a finished parts order system like Japan's but instead a system that places an order for every unit part and single part, and then is assembled into finished parts at the subsidiary or its own plant.

In the case of dealings between an automaker and a supplier, generally the number of suppliers was limited and there dealings with those suppliers occurred over a long period of time with an associated tendency to purchase continually from same suppliers. In contrast, for European and American automakers, single fiscal-year contract was the base, and suppliers tended to change often through an annual competitive bid system.

**3) Strong Involvement of Suppliers in the Parts Development Process**

In the automobile industry, the system for developing parts can happen in two ways:

1) An automaker takes charge of design and development and gives the supplier the plans for manufacture.

2) An automaker presents basic specifications, and a supplier develops the parts based on the specifications, creates a plan, receives approval from the automaker, and manufactures the parts.

In Japan automakers purchase most of their parts using the second method. In contrast, European and American automakers purchase most parts through the first method. This suggests major differences in the relationship between an automaker and a supplier in Japan versus those in the West. That is, instructions from the automaker and some kind of support are not seen relationships between European and American automakers and suppliers.

Lately in Japan, a system known as the "spec tender method" has been used in which an automaker presents a detailed specification and design figure. Suppliers follow the specifications faithfully to actualize the development concept. What this means is both automaker and supplier work in closer cooperation. While the auto industry in Japan is later adopting this method, the existence of a version of the spec tender method in Japan can be found in the background of the industry that raised the design/development power of suppliers for a short period of time.

As noted above, the Japan supplier system is unique, based on close cooperation between automaker and supplier. It began gradually in the 1950s and 1960s, and reached its peak in the 1980s (Fujimoto, 1998). In the late 1980s, European and American automakers began to recognize the advantage of the Japanese-type supplier system.

However, the Japan-type system of suppliers also reached a turning point in recent years. That is, in the 1990s, because of the severe and lengthy "bubble" depression, a tendency toward overproduction became, and the Japanese auto industry began to mature

quickly. As a measure of the environmental change that surrounds an industry like automobiles, Japanese carmakers began promoting many severe cost reductions, such as car type and platform curtailment, reduction in the number of parts and parts commonality, unitizing of parts, and expansion of overseas procurement, beginning in the first half of the 1990s. And, corresponding with a strong world supply accompanied by development of globalization, the result has been an integration of the platform in cooperation with European and American automakers, systematization and modularization of parts, and environmental correspondence technology and information technology. Thus, Japanese automakers are changing their parts purchase policies drastically.

Under these circumstances, it is inevitable that changes will also occur in the Japan supplier system. In particular, as stagnation of home demand becomes stronger, the traditional auto parts business will also gradually collapse, and it is possible that it may shift to a system more like the Western type of dealings into which suppliers can enter freely.

## THESIS SCOPE AND STRUCTURE

The purpose of this thesis is to examine the direction that automotive parts suppliers should take in the rapidly changing environment of the Japanese auto industry.

Chapter 2 describes the present condition of the Japanese auto industry and the accompanying auto parts industry. Chapter 3 describes the factors that alter the relations between an automaker and a supplier. In Chapter 4, I will discuss changes in the purchasing policies of four major Japanese automakers that were carried out from 1996 to 2000. In

Chapter 5, I give some proposals about directions in which supplier should progress in the future based on observations and discussions in Chapters 2, 3, and 4.

The reader should note the following: unless otherwise stated, the phrase "automobile supplier" and "supplier" mean a Japanese first-tier supplier that has a direct relationship with an automaker. Therefore, the analyses and examinations in this thesis are restricted to first- tier suppliers.

# CHAPTER TWO

# CURRENT CONDITIONS IN THE JAPANESE AUTO INDUSTRY

## 2.1 CURRENT TRENDS

### 2.1.1 Production Trends

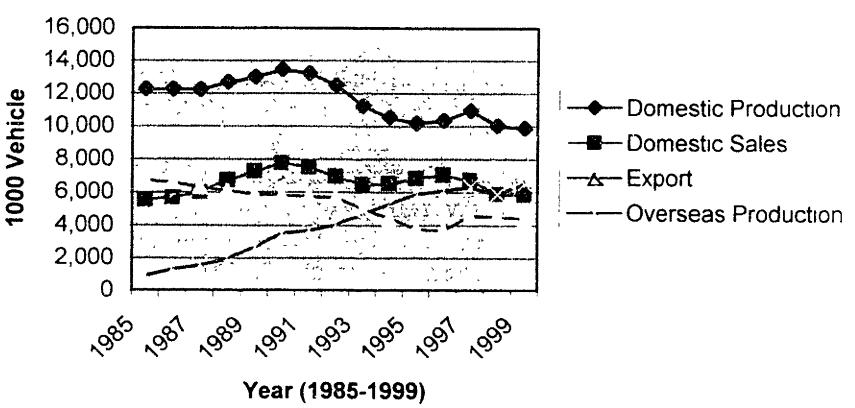
Domestic automobile production in Japan has been consistent, following a long-term growth trend until 1990. However, in the early 1990s, domestic automobile production decreased as the domestic economy began to collapse as a result of several factors: the so-called "bubble economy", maturation of the markets, an expansion of overseas production, and reduced exports. The amount of domestic automobile production reached a peak of 13,487,000 cars in 1990, and began to decline thereafter, dropping to 9,895,000 cars in 1999—the first time in twenty years the amount had dropped below 10 million. It is expected that the amount of domestic production will range from nine to ten million cars from now on (Tsuchiya & Oshika, 2000) (see Table 2-1 and Figure 2-1).

On the other hand, the domestic production capacity of eleven automakers reached a peak of 14,160,000 in 1992 (Fourin, 1999). After that, although domestic production capacity began to drop, 13 million cars were still produced in 1997, and it is expected that about 3 million cars of productive capacity are superfluous. (Tsuchiya & Oshika, 2000).

When one looks at world production, although Japanese automakers' world market share was 37.4% in 1991, it had decreased 6.1% to 31.3% by 1998. The number of

| Table 2-1 Number of Automotive Production and Sales | | | | (Unit:1,000 Vehicles) |
|---|---|---|---|---|
| | Domestic Production | Domestic Sales | Export | Overseas Production |
| 1985 | 12,271 | 5,557 | 6,730 | 950 |
| 1986 | 12,260 | 5,708 | 6,604 | 1,320 |
| 1987 | 12,249 | 6,018 | 6,304 | 1,580 |
| 1988 | 12,700 | 6,721 | 6,104 | 1,980 |
| 1989 | 13,026 | 7,257 | 5,883 | 2,670 |
| 1990 | 13,487 | 7,777 | 5,831 | 3,510 |
| 1991 | 13,245 | 7,525 | 5,753 | 3,700 |
| 1992 | 12,499 | 6,959 | 5,668 | 4,050 |
| 1993 | 11,228 | 6,467 | 5,018 | 4,670 |
| 1994 | 10,554 | 6,527 | 4,460 | 5,290 |
| 1995 | 10,196 | 6,865 | 3,790 | 5,890 |
| 1996 | 10,347 | 7,078 | 3,712 | 6,100 |
| 1997 | 10,975 | 6,725 | 4,553 | 6,340 |
| 1998 | 10,050 | 5,879 | 4,529 | 5,870 |
| 1999 | 9,895 | 5,861 | 4,409 | 6,530 |
| Source: JAMA (Japan Automobile Manufacturers Association) | | | | |

**Figure2-1, Automobile Production and Sales Trends in Japan**




Source: JAMA

automobiles produced in the world increased by 5,690,000 cars from 45,170,00 cars in 1991 to 50,860,000 cars in 1998. However, at the same time, production of automobiles by Japanese automakers decreased by 990,000 cars, from 16,890,000 cars in 1991 to 15,900,000 cars in 1998. The European and American automakers saw similar increases in world automobile production in the 1990s (see Table 2-2).

**Table 2-2 Global Automobile Production Trend**

| | 1991 | 1995 | 1998 | 1991-1998 Growth ratio% |
|---|---|---|---|---|
| Unit: 1,000Vehicles | | | | |
| American makers | 13,857 | 17,056 | 17,069 | 23.2 |
| European makers | 11,906 | 13,120 | 14,357 | 20.6 |
| Korean makers | 1,489 | 2,526 | 1,954 | 31.2 |
| Japanese makers | 16,894 | 16,046 | 15,903 | -5.9 |
| Others | 1,025 | 1,584 | 1,461 | 42.5 |
| Total | 45,171 | 50,332 | 50,744 | 12.5 |
| Unit; Share % | | | | |
| American makers | 30.7 | 33.9 | 33.6 | 2.9 |
| European makers | 26.4 | 26.1 | 28.2 | 1.8 |
| Korean makers | 3.3 | 5.0 | 3.8 | 0.5 |
| Japanese makers | 37.3 | 31.9 | 31.3 | -6.1 |
| Others | 2.3 | 3.1 | 2.9 | 0.6 |
| Total | 100.0 | 100.0 | 99.8 | |

Source: Tsuchiya and Oshika, 2000, p. 13

### 2.1.2 Sales Trends

In the 1980s, domestic automobile sales in Japan benefited from the solid Japanese economy, so sales were generally consistent and increasing. Domestic auto sales broke through 6 million cars in 1987. This tremendous growth of 7,777,000 cars reaches a peak in 1990. However, as the economy slowed and home demand fell, the number of auto sales also dropped accordingly. Domestic sale were less than 6 million cars in 1998, and fell to 5,861,000 cars in 1999, levels not seen since 1986. Since that time, demand for replacement

autos has taken the lead, and large increases in demand are not expected from now on (refer back to Table 2-1).

On the other hand, when export sales are considered, the amount of export sales increased consistently during the first half of the 1980s. In the second half, Japanese automakers changed strategy, moving to overseas local production from an export-oriented global strategy. Although Japanese automakers' overseas production was 950,000 cars in 1985, it continued to increase, moving to 6,530,000 cars in 1999. As for the number of export sales, it reached a peak of 6,730,000 in 1985, then fell to 4,409,000 cars in 1999, and no major recovery is expected for the foreseeable future (refer back to Table 2-1).

### 2.1.3 Profit Trends

Consolidated statements of income of eleven Japanese automakers from 1996 to 1999 show that total sales have leveled off, current income also is declining. When settlement of accounts was finished for the 1999 fiscal year, sales had decreased 0.2% compared with 1998. Ordinary profit decreased 16.4%, current income decreased 13.0%, and operating profit became a deficit. The main causes of this turnaround were aggravation of overall domestic sales and export profits caused by a stronger yen and weaker Euro. The ratio of profit to net sales continued to fall in 1996 and thereafter. The total asset turnover ratio also continued to decline in 1996 and after, and a fall of property efficiency and overproduction capability can also be seen in Table 2-3.

On the other hand, the ratio of overseas sales rose from the 1997 fiscal year owing to stagnation in the domestic market and better conditions in the European and American markets. Looking to the overseas market for a way out of decline, and control of the

| Table 2-3 Total Consolidated Income Statement of 11 Japanese Automakers | | | | | |
|---|---|---|---|---|---|
| | 1996 | 1997 | 1998 | 1999 | 1998-1999 |
| (Unit: Million Yen) | | | | | Growth Ratio |
| **Total Sales** | 34,814,948 | 36,087,881 | 36,880,893 | 36,823,204 | -0.16% |
| **Overaeas Sales** | 18,003,098 | 19,989,497 | 21,722,870 | 20,180,193 | -7.10% |
| **Overseas Sales Ratio** | 51.71% | 55.39% | 58.90% | 54.80% | -4.10% |
| **Operating Profit** | 1,482,087 | 1,429,345 | 1,677,109 | 1,401,864 | -16.41% |
| **Operating Profit Ratio** | 4.26% | 3.96% | 4.55% | 3.81% | -0.74% |
| **Net Profit** | 788,583 | 669,275 | 788,752 | -68,682 | NA |
| **Net Profit Ratio** | 2.26% | 1.85% | 2.14% | -0.19% | NA |
| **Total Assets** | 33,405,157 | 36,059,629 | 36,033,795 | 38,349,971 | 6.43% |
| **Assets Turnover Ratio** | 1.04times | 1.00times | 1.02times | 0.96times | -0.06% |
| Source : "Kokunai Jidousha Chousa Geppou Vol.16" (Fourin 2000) P.1 | | | | | |

exchange risk by expanding overseas production was needed. The industry asked for curtailment of manufacturing, development, and parts cost in the domestic industry, and rationalization of sales and transportation (see Table 2-3 above).

## 2.2 PRESENT CONDITION OF THE JAPANESE AUTO PARTS INDUSTRY

### 2.2.1 Production trends

According to the Machine Statistics annual report of the Ministry of International Trade and Industry, the production amount of 57 major auto parts items changed during the period from 1985 to 1999, as shown in Table 2-4. If one looks at the long-term transition of domestic auto parts production and domestic automobile production, the amount of parts production changes while the amount of automobile production does not, from the beginning of the 1990s. In fact, parts export increased the deviation because of expanding overseas production by each automaker. Since local parts production by suppliers and local parts procurement by automakers were progressing, the deviation between domestic parts production and the domestic automobile production did not expand to match the increase in the number of overseas production.

Still looking at Table 2-4, the domestic parts production amount has a strong linkage with the global production of Japanese automakers. It can be assumed that many of the parts used in overseas production were supplied from Japan. This means that if overseas automobile production increased despite a decline in domestic automobile production, domestic auto parts production will not fall at the same rate as domestic automotive production in the short run. However, it is predicted that a downward tendency in domestic

**Table 2-4 Domestic Production Trends of Major Autoparts 57 items and Automobile**

| | 1985 | 1988 | 1990 | 1991 | 1992 | 1993 | 1994 | 1995 | 1996 | 1997 | 1998 | 1999 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **Major Autoparts 57 items Domestic Production** | | | | | | | | | | | | |
| Production Amount (¥, Billion) | 4,479 | 5,232 | 6,214 | 6,306 | 6,347 | 5,933 | 5,643 | 5,873 | 5,886 | 6,256 | 5,755 | 5,655 |
| Price Index | 93.5 | 94.8 | 100.0 | 103.2 | 104.9 | 106.3 | 107.1 | 106.9 | 107.1 | 109.0 | 109.6 | 109.6 |
| Production Amount Adjusted (¥, Billion) | 4,790 | 5,519 | 6,214 | 6,110 | 6,051 | 5,581 | 5,269 | 5,494 | 5,496 | 5,739 | 5,251 | 5,160 |
| Production Volume Index | 76.6 | 89.1 | 100.0 | 99.2 | 95.0 | 88.6 | 85.9 | 92.2 | 94.4 | 101.1 | 93.3 | 94.7 |
| **Automobile Domestic Production** | | | | | | | | | | | | |
| Number of Vehicle Production(1000Vehicles) | 12,262 | 12,687 | 13,475 | 13,231 | 12,484 | 11,217 | 10,540 | 10,177 | 10,335 | 10,964 | 10,042 | 9,894 |
| Production Amount(¥, Billion) | 12,227 | 14,336 | 16,892 | 17,142 | 16,798 | 15,201 | 14,214 | 13,984 | 14,606 | 15,839 | 14,483 | 13,751 |
| Price Index | 93.5 | 94.8 | 100.0 | 103.2 | 104.9 | 106.3 | 107.1 | 106.9 | 107.1 | 109.0 | 109.6 | 109.6 |
| Production Amount Adjusted (¥, Billion) | 13,077 | 15,122 | 16,892 | 16,610 | 16,013 | 14,300 | 13,272 | 13,081 | 13,638 | 14,531 | 13,214 | 12,547 |
| Number of Vehicle Production Index | 91.0 | 94.2 | 100.0 | 98.2 | 92.6 | 83.2 | 78.2 | 75.5 | 76.7 | 81.4 | 74.5 | 73.4 |
| **Automobile Global Production** | | | | | | | | | | | | |
| Number of Overseas Production(1000Vehicle) | 950 | 1,980 | 3,510 | 3,700 | 4,050 | 4,670 | 5,290 | 5,890 | 6,100 | 6,340 | 5,870 | 6,530 |
| Number of Global Production(1000Vehicle) | 13,212 | 14,667 | 16,985 | 16,931 | 16,534 | 15,887 | 15,830 | 16,067 | 16,435 | 17,304 | 15,912 | 16,424 |
| Production Volume Index | 77.8 | 86.4 | 100.0 | 99.7 | 97.3 | 93.5 | 93.2 | 94.6 | 96.8 | 101.9 | 93.7 | 96.7 |

Source:" Machine Statistics Annual Report", "Jidousha Buhin Snagyou 1999 "( Fourin 2000) P.1
"General Index Time Series for Japan" (Statistics Bureau & Statistics Center 2001)

auto parts production will continue in the long run owing to a decrease in domestic automobile production, an expansion of overseas production, a localization of parts procurement and production, decrease of parts export , and expansion of parts import (see Tables 2-5 and 2-6).

### 2.2.2 Profit Trends

The domestic settlement-of-accounts of 72 major Japanese parts suppliers is shown in Table 2-7. Based on the sum total of these 72 companies, sales in 1998 declined about 14% compared with 1991. Moreover, as for a current income, it is 64% of reduction, and aggravation of parts suppliers' profit is clear.

Japanese automakers embarked on cost reduction rationalizing measures beginning in the first half of the 1990s. These reductions took many forms, such as curtailment of vehicle types and platforms, curtailment and commonizing of auto parts, auto parts as a unit, and an expansion of overseas procurement.

When the average parts price in 1990 is set to 100 so that transition of the producer price index in Table 2-4 also shows, although the level of parts price went up to 107.8 in 1993, it turns out that it fell after that and continued to fall to 96.1 in 1999. When comparing the cost-of-materials sales ratio of an automaker in 1993 and 1998 (see Table 2-8), it turns out that the ratio fell sharply among all automakers including a 13.9% decrease at Toyota, and an 11% decrease at Mazda. Curtailment of cost-of-materials leads to cost-cutting request to parts suppliers, which results in a "profit pressure factor".

Cost-cutting requests from automakers increase in severity every year. Parts suppliers cannot maintain cost improvements in their production process, but need to

strengthen price competition power by rationalization that goes back to the original design, development, modularization, and systematization.

**Table 2-5 Export Trend of Major Autoparts 79 Items**

| | 1990 | 1991 | 1992 | 1993 | 1994 | 1995 | 1996 | 1997 | 1998 |
|---|---|---|---|---|---|---|---|---|---|
| **Export Amount of 79 items(100 Million Yen)** | 34,598 | 33,166 | 34,347 | 35,376 | 37,842 | 38,030 | 39,372 | 39,767 | 36,821 |
| **Price Index** | 100.0 | 103.2 | 104.9 | 106.3 | 107.1 | 106.9 | 107.1 | 109.0 | 109.6 |
| **Export Amount Adjusted(100 Million Yen)** | 34,598 | 32,138 | 32,743 | 33,279 | 35,333 | 35,575 | 36,762 | 36,483 | 33,596 |
| **Volume Index** | 100.0 | 95.6 | 97.3 | 102.9 | 110.6 | 111.0 | 105.4 | 108.2 | 96.0 |

Source:"Japan Trade Monyhly Report","Jidousha Buhin Sangyou 1999" (Fourin 2000) P.3
"General Index Time Series for Japan" (Statistics Bureau & Statistics Center 2001)

**Table 2-6 Import Trend of Major Autoparts 85 Items**

| | 1990 | 1991 | 1992 | 1993 | 1994 | 1995 | 1996 | 1997 | 1998 |
|---|---|---|---|---|---|---|---|---|---|
| **Import Amount of 85 items(100 Million Yen)** | 3,088 | 3,354 | 3,524 | 3,104 | 3,251 | 3,583 | 4,585 | 5,718 | 5,866 |
| **Price Index** | 100.0 | 103.2 | 104.9 | 106.3 | 107.1 | 106.9 | 107.1 | 109.0 | 109.6 |
| **Import Amount Adjusted(100 Million Yen)** | 3,088 | 3,250 | 3,359 | 2,920 | 3,035 | 3,352 | 4,281 | 5,246 | 5,352 |
| **Volume Index** | 100.0 | 114.2 | 125.9 | 125.3 | 142.0 | 162.3 | 187.8 | 223.5 | 219.2 |

Source:"Japan Trade Monthly Report","Jidousha Buhin Sangyou 1999" (Fourin 2000) P.3
"General Index Time Series for Japan" (Statistics Bureau & Statistics Center 2001)

**Table 2-7 Major 72 Japanese Automotive Suppliers' Profit Status ( Non-Consolidated)**

| (Unit: ¥100 Million) | | 1991 | 1992 | 1993 | 1994 | 1995 | 1996 | 1997 | 1998 |
|---|---|---|---|---|---|---|---|---|---|
| Body Assembly | Sales | 2,424.1 | 2,510.9 | 2,173.0 | 2,116.4 | 2,079.3 | 2,201.8 | 2,182.6 | 1,978.9 |
| (7 Companies) | Net Income | 25.3 | 22.8 | 16.7 | 16.8 | 22.4 | 26.8 | 27.5 | 16.1 |
| Engine Parts | Sales | 1,427.6 | 1,396.6 | 1,275.2 | 1,309.8 | 1,282.0 | 1,323.0 | 1,372.7 | 1,264.7 |
| (13 Companies) | Net Income | 13.9 | 13.7 | 9.6 | 15.0 | 16.7 | 17.3 | 18.0 | 1.1 |
| Transmission, Shaft | Sales | 399.4 | 387.1 | 429.4 | 433.1 | 410.4 | 424.7 | 410.8 | 366.3 |
| (5 Companies) | Net Income | 9.0 | 5.7 | 4.0 | 7.3 | 8.1 | 9.2 | 5.9 | 1.3 |
| Brake | Sales | 422.7 | 411.8 | 385.7 | 403.8 | 388.2 | 387.2 | 377.9 | 320.9 |
| (6 Companies) | Net Income | 3.6 | 3.1 | 3.8 | 2.9 | 5.1 | 4.0 | 6.1 | -11.1 |
| Body Parts | Sales | 1,262.1 | 1,273.6 | 1,182.1 | 1,181.2 | 1,120.5 | 1,142.0 | 1,128.2 | 1,037.1 |
| (16 Companies) | Net Income | 25.7 | 18.6 | 10.6 | 21.2 | 20.4 | 22.3 | 15.4 | -2.9 |
| Interior Parts | Sales | 704.2 | 669.7 | 576.6 | 519.5 | 518.5 | 546.3 | 566.8 | 535.5 |
| (7 Companies) | Net Income | 9.1 | 7.5 | 5.5 | 5.6 | 7.2 | 6.3 | 5.3 | 3.7 |
| Instrument | Sales | 514.7 | 506.0 | 473.0 | 467.7 | 456.8 | 484.7 | 503.2 | 477.6 |
| (6 Companies) | Net Income | 7.9 | 8.7 | 7.4 | 8.6 | 7.2 | 8.8 | 7.5 | 4.6 |
| Electronics Parts | Sales | 2,403.9 | 2,398.1 | 2,230.9 | 2,520.4 | 2,124.1 | 2,331.8 | 2,344.4 | 2,254.0 |
| (12 Companies) | Net Income | 56.8 | 42.7 | 26.4 | 46.2 | 44.1 | 63.1 | 59.2 | 42.1 |
| **72 Companies Total** | **Sales** | **9,558.7** | **9,553.8** | **8,725.9** | **8,951.9** | **8,379.8** | **8,841.5** | **8,886.6** | **8,235.0** |
| | **Net Income** | **151.3** | **122.8** | **84.0** | **123.6** | **131.2** | **157.8** | **144.9** | **54.9** |

Source: "Jidousha Buhin Sangyou 1999" (Fourin 2000) P.30

**Table 2-8 Transition of 11 Automakers' Material Cost Ratio**
**(Material Cost / Sales x 100)**

| (Unit: %) | 1993 | 1994 | 1995 | 1996 | 1997 | 1998 | 1993-1998 Growth Ratio |
|---|---|---|---|---|---|---|---|
| **Toyota** | 76.6 | 73.4 | 71.6 | 69.2 | 62.9 | 62.7 | -13.9 |
| **Honda** | 58.5 | 53.7 | 536.0 | 53.9 | 53.7 | 50.8 | -7.7 |
| **Nissan** | 73.3 | 73.3 | 71.1 | 68.5 | 69.3 | 68.0 | -5.3 |
| **Mitsubishi** | 65.6 | 65.7 | 62.1 | 61.4 | 61.8 | 57.7 | -7.9 |
| **Mazda** | 77.0 | 75.8 | 73.2 | 70.7 | 70.7 | 66.0 | -11.0 |
| **Fuji Heavy Industry** | 68.7 | 65.1 | 63.7 | 60.7 | 60.9 | 60.1 | -8.6 |
| **Isuzu** | 76.3 | 73.2 | 71.0 | 68.9 | 70.4 | 72.0 | -4.3 |
| **Suzuki** | 73.3 | 73.8 | 73.8 | 69.4 | 73.2 | 68.7 | -4.6 |
| **Dauhatsu** | 59.6 | 58.9 | 56.6 | 57.2 | 58.5 | 59.1 | -0.5 |
| **Hino** | 72.7 | 70.6 | 68.3 | 69.9 | 69.9 | 69.9 | -2.8 |
| **Nissan Diesel** | 74.9 | 72.1 | 70.6 | 70.0 | 70.1 | 73.9 | -1.0 |

Source: "Kokunai Jidousha Chousa Geppou Vol.6" (Fourin 1999) P7.

# CHAPTER THREE

# THE CHANGING ENVIRONMENT IN THE JAPANESE AUTOMOTIVE INDUSTRY

## 3.1 COMPETITION GROWS MORE INTENSE

Today, the worldwide auto industry is facing a state of excessive production capacity, and each automaker is under intense pressure to gain market share. Technically, the market is in transition to a new stage, one that is focused on environmental measures and information technology. To win this competition, large amounts of capital and technology and a world-scale competitive strategy are needed.

The Japanese auto industry is no exception. Competition is occurring along the following four lines:

1) reducing production costs by rationalizing production and development, restructuring, and transfer of production to lower-cost countries.
2) developing production systems that perform production efficiently, such as modularization.
3) improving competitive power by shortening the term of development, commonizing platforms, developing world strategies, and entering the markets of newly emerging countries.
4) technical development of new environment-friendly engines, intelligent transportation system (ITS), etc.

The intensified competition between automakers also has had a major impact on suppliers, who face the following problems.

### 3.1.1 Cost Reductions

Since the middle of the 1990s, Japanese automakers have made severe cost reduction requests to their suppliers. A cost reduction request is usually a planning directive that becomes stronger in the future. For example, Toyota is planning to reduce its parts cost by 30% in three years after 2001. This means that that design, procurement, and manufacturing engineering sections at Toyota must propose cost reductions of manufactured goods in cooperation with the suppliers.

Similarly, at Nissan a 20% parts cost reduction program will be in effect for three years, from 1999 to 2002, as part of the company's revival plan—which it decided in 1999. Mazda also aims at parts cost reductions of 15% by 2004, focusing on commonizing parts with Ford. (*Nihon Keizai Shinbun, 12/21/00).*

### 3.1.2 Changing the Parts Business Connections

Because of globalization among automakers and development of global optimum purchasing, many parts business connections are becoming more fluid among suppliers who do not have past business connections or are part of a *keiretsu*. For example, as part of Nissan's 1999 Revival Plan, the company is planning to reduce the number of suppliers from the current 1145 companies to 600 companies—an action which caused considerable shock among *keiretsu* suppliers (Fourin, 1999).

Automakers no longer guarantee continuing transactions with suppliers unless they can respond to the automaker's needs on issues such as cost reduction, quality, and technical power. On the other hand, this leaves suppliers free to establish relationships with other automakers with whom they may not have had transaction before.

### 3.1.3 Development and Design Rationalization

Recently, as a result of the automakers' development rationalization and cost reduction, the lead-time for new product development has been shortened. With this shortening, the participation by suppliers in development from the initial stage is indispensable, and the role of suppliers is increasing.

### 3.1.4 Reorganization of Automakers

When an automaker reorganizes, it looks over the conventional development and purchase organization from the viewpoint of global strategy. In connection with this, massive changes in conventional transactions with former suppliers often occur, and in many cases suppliers are being asked to cooperate with foreign suppliers.

### 3.1.5 Support for Multinational Management

The progress of international reorganization among automakers and the strategy that supplies a common model to markets not only in Japan, the U.S., and Europe but also in emerging markets such as Asia, Central America, and East Europe, is increasingly important. In this scenario, the model will developed by a development section somewhere

in the world and will be manufactured and sold all over the world. Therefore, suppliers will be asked to supply the requisite parts to a global automaker production base when required.

### 3.1.6 Promotion of Modularization

European and American automakers are promoting modularization as a means of achieving development and production efficiencies and to improve profitability. Japanese automakers have also started to consider modularization. Each supplier is facing the need to establish its own strateg, to succeed with the new requirements of modularization.

### 3.1.7 New Technology Development

The greatest technical points at issue in the auto industry of the future may be the development of environmentally sound new engine systems, such as electric vehicles and a new type of fuel cell. Moreover, development of Intelligent Transport Systems (ITS) which relate technology to the growing information society, is also progressing, and it is expected that suppliers will play a large role in these fields.

## 3.2 CHANGING MARKET TRENDS

The changes in new passenger car sales performance in Japan, from 1989 to 2000, is shown in Table 3-1. The following points are known when considering the sales patterns among small passenger cars, common passenger cars, and light passenger cars. First, the long-term downward tendency among small passenger cars is remarkable. Moreover, although the number of sales grew every year until 1996 with the recreational vehicle and

**Table 3-1 Sales Trend of New Car in Japan**

(Unit: Vehicles)

| | Passenger Car | | Truck | | Bus | Light Vehicle | | Total Sales |
|---|---|---|---|---|---|---|---|---|
| | Common | Small | Common | Small | | Passenger | Truck | |
| 1989 | 276,538 | 3,734,727 | 186,636 | 1,340,163 | 23,530 | 392,484 | 1,302,595 | 7,256,673 |
| 1990 | 467,490 | 3,839,221 | 193,775 | 1,449,678 | 24,925 | 795,948 | 1,006,456 | 7,777,493 |
| 1991 | 663,611 | 3,364,285 | 187,235 | 1,506,022 | 23,796 | 840,337 | 939,473 | 7,524,759 |
| 1992 | 713,828 | 2,966,003 | 147,367 | 1,485,009 | 21,577 | 774,181 | 851,108 | 6,959,073 |
| 1993 | 683,750 | 2,743,336 | 122,046 | 1,319,019 | 19,025 | 772,365 | 807,738 | 6,467,279 |
| 1994 | 687,463 | 2,712,682 | 146,769 | 1,346,894 | 17,843 | 810,023 | 805,022 | 6,526,696 |
| 1995 | 889,260 | 2,654,291 | 177,264 | 1,411,296 | 17,303 | 900,355 | 815,265 | 6,865,034 |
| 1996 | 897,985 | 2,813,362 | 168,299 | 1,478,732 | 17,227 | 957,381 | 744,759 | 7,077,745 |
| 1997 | 873,220 | 2,701,686 | 150,871 | 1,370,964 | 15,763 | 917,097 | 695,425 | 6,725,026 |
| 1998 | 756,117 | 2,389,671 | 93,818 | 1,081,571 | 14,141 | 947,360 | 596,747 | 5,879,425 |
| 1999 | 723,999 | 2,193,920 | 85,091 | 970,243 | 14,478 | 1,236,165 | 637,320 | 5,861,216 |
| 2000 | 770,220 | 2,208,387 | 84,626 | 1,015,313 | 16,571 | 1,281,181 | 586,615 | 5,962,913 |

Source: Japan Automobile Sales Union

multi-purpose vehicle boom in the 1990s, there has been little increase after 1996, and the number of sales is decreasing.

When looking at light passenger cars, because of the long-term stagnation in domestic business, the number of sales rose, from 390,000 cars in 1989 to 1,280,000 cars in 2000. It is clear that the demand for passenger cars is growing along with the demand for economy and practical use.

Disposable income in national worker households has increased 9.8%, from a monthly average of ¥440,539 in 1990 to ¥483,910 in 1999 as shown in Table 3-2. According to the Family Income and Expenditure Survey Report of the Management and Coordination Agency (2000), consumption expenses grew 4.4%, from ¥331,595 in 1990 to ¥346,177 in 1999. Among other consumption expenditures, automobile purchases repeated a pattern of rise and fall in a cycle of two to three years from ¥6,842 in 1990, and it remains at ¥7,335, a

| Table 3-2 Disposable Income and Automotive Purchase Expenditure in Japan | | | |
|---|---|---|---|
| | | | (Unit: Yen) |
| | Disposable Income | Consumptive Expense | Automobile Purchase |
| 1990 | 440,539 | 331,595 | 6,842 |
| 1991 | 463,862 | 345,473 | 6,993 |
| 1992 | 473,738 | 352,820 | 6,479 |
| 1993 | 478,155 | 355,276 | 8,891 |
| 1994 | 481,178 | 353,116 | 7,144 |
| 1995 | 482,174 | 349,663 | 7,734 |
| 1996 | 488,537 | 351,755 | 8,409 |
| 1997 | 497,036 | 357,636 | 8,795 |
| 1998 | 495,887 | 353,552 | 9,278 |
| 1999 | 483,910 | 346,177 | 7,335 |
| Source: Management and Coordination Agency " Family Income & Expenditure Survey" | | | |
| "Kokunai Jidousha Chousa Geppou Vol.12" (Fourin 2000) P.25 | | | |

decrease of 21% compared with 1999. Thus, the consumers' control of their tendency to buy automobiles is remarkable.

Table 3-3 shows the transition of the mean unit price of a passenger car and the unit price index, where the mean unit price of a small passenger car and a common passenger car, which is an automaker's best seller, has fallen every year. On the other hand, the mean unit price of light passenger cars is increasing sharply. However, the profit margin of small passenger cars and common passenger cars is higher than that of light passenger cars. It is thought that the unit price fall of the small and common passenger cars is a factor in the decline of automakers' profit.

In light of these trends, it is clear that automakers are seeing a slow increase in the quantity of autos sold; that consumers are controlling their expenditures for automobiles; and there is a downward trend in the selling price in the small and common automobile market. These factors have the largest market scale, and therefore, automakers have little

| Table 3-3 Average Price of Passenger Car in Japan | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| | | | | | | | | (Unit: Yen) |
| | 1990 | 1993 | 1994 | 1995 | 1996 | 1997 | 1998 | 1999 |
| **Price Index** | 100.0 | 106.3 | 107.1 | 106.9 | 107.1 | 109.0 | 109.6 | 109.6 |
| **Light Passenger Car** | | | | | | | | |
| Average Price | 684,000 | 759,000 | 789,000 | 863,000 | 879,000 | 909,000 | 950,000 | 974,000 |
| Adjusted Average Price | 684,000 | 714,017 | 736,695 | 807,297 | 820,728 | 833,945 | 866,788 | 888,686 |
| **Small Passenger Car** | | | | | | | | |
| Average Price | 1,179,000 | 1,161,000 | 1,163,000 | 1,176,000 | 1,213,000 | 1,206,000 | 1,190,000 | 1,148,000 |
| Adjusted Average Price | 1,179,000 | 1,092,192 | 1,085,901 | 1,100,094 | 1,132,586 | 1,106,422 | 1,085,766 | 1,047,445 |
| **Common Passenger Car** | | | | | | | | |
| Average Price | 2,123,000 | 2,128,000 | 2,013,000 | 2,016,000 | 2,082,000 | 2,089,000 | 2,054,000 | 1,947,000 |
| Adjusted Average Price | 2,123,000 | 2,001,881 | 1,879,552 | 1,885,875 | 1,943,978 | 1,916,514 | 1,874,088 | 1,776,460 |
| Source: "Machine Statistics Annual Report" | | | | | | | | |
| "Kokunai Jidousha Chousa Geppou Vol.12" (Fourin 2000) | | | | | | | | |
| "General Index Time Series for Japan" (Statistics Bureau & Statistics Center 2001) | | | | | | | | |

other choice but to seek profit through cost reductions. Therefore, automakers pass the pressure on to suppliers in the form of severe parts cost reduction requests.

## 3.3 PROGRESS OF GLOBALIZATION

For Japanese automakers, prior to 1982, overseas production was mainly restricted to the assembly of knockdown kits in the Asian region. Overseas local production moved into high production at the time Honda began local production in the U.S. in 1982, following by Nissan's production of its pickup truck in the U.S. in 1984. Nissan also started production of a passenger car the following year. Thereafter, Toyota began to produce passenger cars in California under a joint venture with GM in 1985. Toyota also started a passenger car in Kentucky the next year. With the exception of Daihatsu Motor, eight of nine companies that manufacture passenger cars in Japan began local production in North America. Similarly, in Europe, Nissan started passenger car production in Britain in 1984, and Honda started passenger car production there in 1992.

In order to meet Japanese automakers' international expansion, Japanese suppliers also began developing internationally in the latter 1980s. According to statistics of the Japanese Automotive Parts Industry Association (JAPIA), the number of overseas production and development positions among JAPIA member companies reached 1,212 as of October 1999. Southeast Asia serves 347 positions (28.2%), North America 322 positions (26.6%), East Asia 275 positions (22.7%), and Western Europe 114 positions (9.4%) (see Table 3-4).

**Table 3-4 Japanese Suppliers' Overseas Production/Development Positions(As of October,1999)**

| | North America | Middle&South America | Western Europe | Eastern Europe | East Asia | Southeastern Asia | South Asia | Oceania | Middle East | Africa | Total | Ratio |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **Engine Parts** | 60 | 7 | 15 | 1 | 71 | 80 | 11 | 1 | | | **246** | **20.30%** |
| **Transmission, Shaft** | 54 | 15 | 26 | 3 | 38 | 49 | 6 | 1 | 1 | | **193** | **15.90%** |
| **Brake, Frame** | 18 | 3 | 3 | | 8 | 32 | 7 | | | | **71** | **5.90%** |
| **Body Parts** | 76 | 14 | 20 | | 42 | 53 | 9 | 2 | 1 | | **217** | **17.90%** |
| **Other Parts, Material** | 27 | 2 | 6 | | 27 | 35 | 3 | | | | **100** | **8.30%** |
| **Electric, Electronics** | 65 | 20 | 36 | 7 | 69 | 77 | 17 | 9 | 1 | 2 | **303** | **25.00%** |
| **Accessory** | 15 | 8 | 8 | | 18 | 15 | | 1 | 1 | | **66** | **5.40%** |
| **Others** | 7 | | | | 2 | 6 | 1 | | | | **16** | **1.30%** |
| **Total** | **322** | **69** | **114** | **11** | **275** | **347** | **54** | **14** | **4** | **2** | **1,212** | **100%** |
| **Ratio** | **26.60%** | **5.70%** | **9.40%** | **0.90%** | **22.70%** | **28.60%** | **4.59%** | **1.20%** | **0.30%** | **0.20%** | **100%** | |

Source: Japan Automotive Parts Industry Association " Nihon no Jidousha Buhin Kogyo" (JAPIA 2000)

By parts category, internationalization is put electric and electronic products at the top in terms of orders for engine parts and body parts.

When supplier internationalization is looked at by age (Table 3-5), it turns out that the overseas expansion of suppliers who have expanded continuously since 1985 is locked together with the internationalization of an automaker, and is growing since the second half of the 1980s. In the 1990s, although overseas expansion among suppliers settled temporarily, it began expanding again from the mid-1990s because of emerging automobile markets.

While foreign operations have expanded quickly, it is difficult to say that suppliers generate sufficient profit from overseas production operations. According to JAPIA investigations, in Asia where suppliers' elapsed years are longer, the automotive industry and market developing, and suppliers have stabilized, many suppliers are seeing profits. However, in the U.S. 60% of suppliers still show an accumulated loss (JAPIA, 1997). JAPIA suggests that in order for suppliers to develop further internationalization, it is necessary to solve four problems:

1) maintain high operating ratios, reserve sufficient mass production volume
2) acquire value through local operation
3) establish independent management
4) acquire a business entity system and global management know-how(JAPIA, 1997).

Overseas expansion has not only followed in the footsteps of Japanese automakers, but suppliers can say that they have been asked to internationalize based on original global strategy from now on.

**Table 3-5 Japanese Suppliers' Timing of Overseas Presence**

| | Before1980 | 1980-1984 | 1985-1989 | 1990-1994 | 1995-1999 | Not Clear | Total | Ratio |
|---|---|---|---|---|---|---|---|---|
| **Engine Parts** | 37 | 10 | 55 | 55 | 88 | 1 | **246** | **20.30%** |
| **Transmission, Shaft** | 32 | 6 | 54 | 39 | 60 | 2 | **193** | **15.90%** |
| **Brake, Frame** | 3 | 5 | 15 | 12 | 36 | 0 | **71** | **5.90%** |
| **Body Parts** | 18 | 10 | 63 | 37 | 89 | 0 | **217** | **17.90%** |
| **Electric, Electronics** | 39 | 19 | 87 | 51 | 106 | 1 | **303** | **25.00%** |
| **Other Parts, Material** | 17 | 3 | 31 | 22 | 27 | 0 | **100** | **8.30%** |
| **Accessory** | 10 | 8 | 7 | 25 | 15 | 1 | **66** | **5.40%** |
| **Tire** | 3 | 0 | 1 | 0 | 1 | 0 | **5** | **0.40%** |
| **Others** | 0 | 1 | 7 | 1 | 2 | 0 | **11** | **0.90%** |
| **Total** | **159** | **62** | **320** | **242** | **424** | **5** | **1212** | **100%** |
| **Ratio** | **13.10%** | **5.10%** | **26.40%** | **20.00%** | **35.00%** | **0.40%** | **100%** | |

Source: Japan Automotive Parts Industry Association " Nihon no Jidousha Buhin Kogyo" (JAPIA 2000)

## 3.4 ALLIANCES WITH EUROPEAN AND AMERICAN AUTOMAKERS

After the 1970s and until the early 1990s, automakers in Japan demonstrated overwhelming competitive power in the world market. However, the Japanese automakers that entered the markets under a European or American automaker's influence have increased in number.

Beginning with Ford's increased investment in Mazda to 33.4% in 1996, GM increased its investment in Suzuki and Isuzu to 9.99% and 49.0% in 1998, respectively. Renault invested 36.8% in Nissan in 1999. GM also decided on a 20% capital participation in Subaru (Fuji Heavy Industry) in the same year. Finally, Daimler Chrysler invested 34% in Mitsubishi in 2000.

The main purpose of capital investment for these European and American automakers is the desire to acquire a Japanese automaker's development power and Asia position. For Japanese automakers, since profits have declined owing to the long-term economic depression in Japan, and their global enterprise strategy has failed and cannot cover the cost or risk of advanced automobile technical development, those automakers have cooperated with European and American automakers in order to survive.

Only Toyota and Honda are not under the influence of another automaker among the present 11 automakers in Japan (see Table 3-6). However, Toyota has entered into a cooperative relationship in the areas of environmental technology and ITS technology with GM and Volkswagen. Honda has agreed on a mutual supply of engines with GM.

As for the auto industry at present, automakers such as GM, Ford, Toyota, Volkswagen, and Daimler Chrysler, are striving for dominance. The industry is currently at

**Table 3-6 Capital Tie-up of Japanese Automakers(As of February,2001)**

| Automakers | Automaker as a Stakeholder and Ratio of Shareholding |
|---|---|
| Toyota | N/A |
| Honda | N/A |
| Nissan | Renault 36.8% |
| Mitsubishi | Daimler Chrysler 34%, Volvo 5% |
| Mazda | Ford 33.4% |
| Fuji Heavy Industry | GM 20% |
| Isuzu | GM 49% |
| Suzuki | GM 9.99% |
| Daihatsu | Toyota 51.2% |
| Hino | Toyota 20.1% |
| Nissan Diesel | Renault 22.5%, Nissan 22.5% |

Source: Tsuchiya and Oshika, 2000, p. 8

the point where each automaker is using its skills in multinational management, and its strategic superiority, and the result may be larger-scale strategic alliances among automakers in the future.

As a result of the world reorganization in the auto industry, so too for the auto industry of Japan, the company that accepts capital participation from a foreign automaker will acquire about 50% of production and sales in Japan. These Japanese automakers promote the commonization of platforms and parts in conjunction with a foreign automaker as its stakeholder.

This brings an expansion of opportunities for foreign suppliers to enter the Japanese market, and along with it, intensified competition. On the other hand it also becomes an opportunity for Japanese suppliers to expand their parts market into the rest of the world by delivering parts to the Japanese automaker that accepted foreign capital. Establishing cooperative relationships with foreign suppliers may become very important for world market share expansion for Japanese suppliers when domestic demand reaches a point of

little increase and profits continue to shrink. However, in order to match the product development of the foreign automakers' initiative and meet their global commonization strategy, Japanese suppliers must become much more competitive in cost, quality and technology than ever before.

At present, strategic alliances containing a capital relationship between Japanese suppliers and foreign suppliers are increasing. According to investigations by JAPIA, reorganizations of suppliers in Japan can be classified into the following ten types.

| |
|---|
| 1) Globalization is promoted independently, foreign companies are acquired, and a world leading system supplier is aimed at. |
| 2) An alliance relation is built, it cooperates in an equal position with a foreign company, and world strategy is developed. |
| 3) Emphasizing the original significance of existence in a Japanese market and Asia especially, it enters under the influence of a huge foreign system supplier, and a base is stabilized. |
| 4) The status as a component supplier is established in the field differentiated on the basis of the core competence, and enters into the international market of Japan, the U.S. and Europe. |
| 5) Cooperation relation between domestic suppliers are established and developed, and a company base is strengthened uniquely. |
| 6) Stocks are held between Japanese suppliers in order for companies for foreign funding entry evasion and a mutual complement, and a cooperation relation is established. |
| 7) Reorganization is advanced by merger and cooperation of domestic companies, however, when international deployment is considered, there may also be cooperation with foreign funding. |
| 8) It cooperates with a foreign company for the purpose of development and a mutual complement of a production base for every individual part. |
| 9) The cooperation in a group is strengthened for the improvement in modularization correspondence capability, continuing an original route. |
| 10) The stocks are sold based on the strategy of a automakers that is a investor, and be involved in the reorganization in nevertheless it doesn't want to be reorganized. |

Source: JAPIA, 2000, pp. 63-64.

As noted above, it is necessary for each supplier to have an original strategy that aims to change the rapid and worldwide enterprise environment and acquire new business opportunities.

## 3.5 INCREASING NEED FOR ADVANCED VEHICLE TECHNOLOGY

### 3.5.1 Environment Friendly Vehicles

Today, the technical requirements for cars are changing dramatically. These technical requirements, which will attract attention for most of the first fifty years of the 21st century, correspond to social demands for earth/environment resolution and development of information technology.

Cars in the 21st century will take into consideration man's relationship to the earth and its environment. This means not only the basic concepts of recycling from the design stage forward, but also technology and designs that result in efficient energy consumption, including a trend toward environmentally favorable power train development (see Table 3-7).

Each company responds with various methods, such as a joint project for original developments, and the introduction and use of technological know-how from other companies. This has meant, for example, the technical acquisition of the direct injection diesel engine and direct injection gasoline engine, which is the center of present low miles-per-gallon technology, the fuel cell vehicle which will become the core of environmental conforming technology, and a hybrid-type vehicle. With regard to the fuel cell vehicle and hybrid vehicle, since immense development costs are involved with the aim of establishing a global standard for the technology, joint development relations between the major automakers have already been established. Ford and Daimler Chrysler are cooperating in the development of a fuel cell vehicle, and GM and Toyota have established a comprehensive

**Table 3-7 Major Automakers' Environmental Correspondence Power Train Development**

**A: Already on sale**
**B: Already come into practical use**
**C: Under development**

| | | Toyota | Nissan | Honda | Mitsubishi | Mazda | Fuji | Daihatsu | Suzuki | ND | Hino | Isuzu |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Direct Injection Gasoline Engine | | A | A | | A | B | B | C | | | | |
| Direct Injection Diesel Engine | Passenger | B | B | | | B | | | | | | A |
| | Commerce | | | | A | | | | | A | A | A |
| Natural Gas Vehicle | | A | A | A | A | A | | A | | A | | A |
| Electric Vehicle | Lead Battery | | | | A | A | A | A | A | | | A |
| | NiCd Battery | A | | A | | | | | | | | |
| | Lithium Battery | | A | | B | B | | | | | | |
| | Other | | | | | | | | | | | |
| Hybrid Vehicle | Passenger | A | A | A | C | | C | C | | | | |
| | Commerce | A | | | A | | | | | A | A | A |
| Fuel Cell Vehicle | | C | | C | | | | | | | | |

| | | Daimler | BMW | VW | Volvo | Renault | PSA | Fiat | GM | Ford |
|---|---|---|---|---|---|---|---|---|---|---|
| Direct Injection Gasoline Engine | | C | | B | B | B | C | | B | C |
| Direct Injection Diesel Engine | Passenger | A | B | A | | A | B | A | A | B |
| | Commerce | A | | | A | | | | | |
| Natural Gas Vehicle | | | A | | A | C | C | A | A | A |
| Electric Vehicle | Lead Battery | | | | | A | | A | A | A |
| | NiCd Battery | | | | | | | | | |
| | Lithium Battery | | | | | | | | | |
| | Other | C | C | A | | | | | | |
| Hybrid Vehicle | Passenger | | | A | C | C | C | | C | C |
| | Commerce | | | | | | | | | |
| Fuel Cell Vehicle | | C | C | C | | | | | C | C |

Source:Y. Tsuchiya and T. Oshika " Nihon Jidousya Sangyou no Jitsuryoku " (Diamond-sha 2000) P.138-139

cooperative relationship to develop an electric vehicle, a hybrid vehicle, and a fuel cell vehicle.

An environment-friendly power train has big impact on suppliers. Such technology may requires many changes in car parts manufactured and quantities. For example, since a fuel cell vehicle has no exhaust discharge, the exhaust pipe is unnecessary. The vehicle will not need a fuel injection pump, ignition system parts, engine oil, or an oil pump. Many major auto parts will become unnecessary, thereby reducing business for suppliers, and other competitors from other industries will enter the market to supply the new products (Oshika, 1999)

### 3.5.2 Intelligent Transport Systems

The trend toward Intelligent Transport Systems (ITS) will influence greatly the supplier industry. ITS meets user needs and social needs by providing safety improvements, improvement in transportation efficiency, and improvement in comfort, by using the latest information communication technology by building traffic infrastructures, such as roads and cars as a whole system.

In Japan, ITS activity is occurring in nine different fields:

1. Advances in navigation system
2. Electronic toll collection
3. Assistance for safe driving
4. Optimization of traffic management
5. Increasing efficiency in road management
6. Support for public transport
7. Increasing efficiency in commercial vehicle
8. Support for pedestrians
9. Support for emergency vehicle operations

These efforts are being promoted by the Ministry of Land and Natural Resources, Management and Coordination Agency, Ministry of Economy, Trade and Industry, the National Police Agency, and VERTIS, a private sector organization.

A new system, Vehicle Information Communication System (VICS), interlocked with a car-navigation system, can receive and send road service assistance. Beginning in 2000, an automatic high toll collection system was started in some regions. It is planned in 2002 to introduce a control support system that assesses information about vehicle obstacles and their circumference, and can then guide vehicles around the obstacles. The driving force behind the spread of the navigation system and VICS is clear: falling prices, improvements in product value-added, development competition among domestic AV equipment makers and comprehensive electrical equipment manufacturers who have strong international competitive power (Oshika, 2000, p.11).

VERTIS, a private enterprise organization promoting ITS, calculates that the market for ITS-related apparatus will increase to ¥50 trillion in the future (Website, Ministry of Land and Resources). There are many new ITS-related products to which the technology of electronic device makers and communication apparatus makers—other than conventional auto parts supplier—can be applied. Therefore, if suppliers expect to enter this market, it is necessary for them to clarify the position of their technology in the ITS field. Technical alliances with other companies are one method that might enable conventional suppliers to enter this new and growing market.

## 3.6 MODULARIZATION

Modularization is defined as "the activity in which a carmaker outsources development or assembly in larger units to a supplier" (JAPIA, 1999, p.1). European automakers were the first to begin promoting modularization. They originally had high in-house production of parts, i.e., 50% or more were inside parts in the 1980s (JAMA Magazine, 1998, p.2). Automakers such as Volkswagen, Daimler, Renault, and Europe Ford, promoted modularization as a new method of cost-cutting in the 1990s.

In the basic concept of modularization, an automaker transfers the assembly of parts, the selection of a second-tier supplier, purchasing, and quality control to the first-tier supplier who is used as a module supplier. Moreover, the supplier builds a module factory next to the automaker's assembly plant, thus reducing physical distribution and inventory costs by carrying out synchronous production. The aim was "assembly cost reduction for carmakers", and "management cost reductions through supplier curtailment" (JAPIA, 1999, p.3). In Europe and America, the assembly of all individual parts has in the past been performed conventionally by the automaker's main production line. Therefore, assembly by modularization and outsourcing the process to a supplier has many advantages. However, in Japan, the automaker has traditionally assembled parts delivered by the supplier as a unit to the sub-assembly line. Thus, for Japanese automakers there are fewer advantages of modularization as promoted by European and American automakers.

### 3.6.1 Advantages vs. Disadvantages of Modularization for Automakers

According to an investigation by JAPIA, the introduction of modularization among Japanese automakers has both advantages and disadvantages, which can be divided roughly into the following three points (JAPIA, 1999, pp.3-4).

- First, there is dramatic cost reductions and added value creation accompanied by design improvements when using modular units. In the 1990s Japanese suppliers achieved severe cost reductions requested by Japanese automakers by doing VA/VE activities. However, cost reduction on single parts is limited, so achieving the required cost reductions and value-added by design improvements in a modular unit is viewed as a solution to this problem.
- Second, modularization reduces the development burden on automakers. Demand is increasing for automakers to invest in next-generation technology around environmental and safety issues, or shorten development terms, and remain on the cutting edge of information technology. By introducing modularization, it becomes possible for automakers to use fewer development resources because they can outsource development based on existing technology to suppliers.
- Third, European and American automakers promoted modularization promptly, but their current concept of modularization is a simple transfer of the parts assembly process from the automakers to the suppliers. However, while European and American automakers accumulate know-how about modularization, Japanese automakers can develop innovations and advanced measures which will position them well in the future.

On the other hand, one negative is automakers' fear that they will lose the advantage in parts development power and technology. Automakers worry that too much transfer of parts development and related technology will result in increasing unfamiliarity in these areas. Also, the higher the degree of dependence on supplier, the lower automakers control becomes. Third, too much empowerment to the supplier in development and manufacturing automobile parts results in the loss of core technology to the automaker.

### 3.6.2 Advantages vs. Disadvantages of Modularization for Suppliers

JAPIA's investigation (1999, p.20) also found a number of advantages and disadvantages of modularization for Japanese suppliers. The following are advantages:

- A supplier's sphere of business is expanded. As long as the supplier is confident about the global competitiveness of its module product, then promotion of modularization represents a good opportunity to expand business.
- A second advantage is expansion of sales. Since modularization expands the unit parts, it is expected that sales will inevitably expand. However, there is no guarantee that the profit ratio will increase because of modularization.
- Development power should improve. Suppliers will gain know-how because they can consider a vehicle as a whole when developing parts, which leads to enterprise expansion.

Disadvantages are:

- Development and guarantee-of-quality costs will rise.
- Many suppliers worry about an added burden of investment for inspection equipment.

- Added investment for product development or new production
- Additional personnel training may be required
- Management risk will increase.

As mentioned above, there are advantages and disadvantages for both automakers and suppliers if they decide to promote and adopt modularization. At the moment, modularization is at the trial-and-error stage in the Japanese auto industry. However, it is clear that modularization is becoming a common trend in the world auto industry, and no one can ignore it. For example, suppliers who do not adopt modularization run the risk of losing profitable dealings with European and American automakers when these automakers strengthen their tendency to order parts based on modularization in the future. The same is true for Japanese automakers.

As automakers prepare for modularization, that action is a kind of insurance for suppliers who will participate in the international auto parts market in the future. However, there are questions that remain for suppliers: What format does the supplier/automaker relationship take if modularization is adopted? Will the supplier directly supply an automaker as a module supplier? Or will the supply take place as a second-tier supplier? Suppliers need to establish a strategy to cope with modularization.

When the supplier aims to be the primary module supplier, the following measures need to be considered:

- Investigation of the technology in related fields
- Strengthen cooperation with other suppliers
- Takeovers, mergers, external sources for talented personnel
- Technical evaluation of parts, strengthening of quality evaluation capability

As a second-tier supplier, these issues need to be considered:

- Investigation of the technology in an elated field
- An injection of the management resources to an elated field

Making the decision as to which type of supplier is important. As long as a supplier has not chosen which field, participation in modularization will be difficult and the supplier will not be able to progress to the following step.

## 3.7 BREAKDOWN OF *KEIRETSU*

A *keiretsu* originally meant "related groups of companies" in Japanese. In the Japanese auto industry and electronics device industry, for instance, intimate relationships have been formed among such groups, based on such things as capital investment from large-scale manufacturers to suppliers, long and stable dealings, exchange of talented personnel, and technical instruction between large-scale manufactures and suppliers. These types of relationships are also called *keiretsu* in Japan. While *keiretsu* were thought to be one factor explaining the competitiveness of Japanese products in the international market, it is also true that it was a symbol of exclusive business connections that are peculiar to Japan.

Automakers had *keiretsu* suppliers under their influence, and mutual developments between an automaker and suppliers have brought long-term, stable dealings and close exchanges. In particular, Toyota and Nissan have built large-scale *keiretsu* supplier groups through capital investment and personnel exchange. In the 1990s, however, each automaker was forced to reconsider its policy toward *keiretsu* suppliers due to the sharp decrease in domestic production and sales and intensified competition in the domestic market.

These relationships are satisfactory if the *keiretsu* supplier is equal to its international competitors in areas of cost, quality, and technology. However, when the *keiretsu* is not, then continued dealings with such supplier causes a decline in an automaker's competitive power. Therefore, the tendency to purchase parts beyond the *keiretsu* suppliers has grown. For automakers, choosing suppliers based solely on cost, quality, and technology factors as the first priority, whether or not they belong to a *keiretsu,* is becoming common.

This change of the relations between automakers and *keiretsu* suppliers can be seen in the suppliers' sales dependence. Table 3-8 shows the sales dependence of suppliers whose sales depend more than 10% on Toyota, Nissan, Honda and Mazda. Although it is difficult to conclude that there is a general tendency, because the number of suppliers is restricted, it appears that sales dependence is leveling off or moving downward with each automaker. It is clear from the table that the business connections between automakers and *keiretsu* suppliers is gradually becoming more flexible.

When looking at automakers' policy regarding *keiretsu* suppliers, it turns out that Toyota and Nissan are taking opposite paths. Toyota has increased its capital investment ratio in eleven major *keiretsu* companies, including Hino and Daihatsu, in March 1998, as shown in Table 3-9. For example, as modularization as developed, the role that suppliers play in development and production of cars becomes larger. Closer relations between an automaker and suppliers is therefore required. The decision to increase the ratio of capital investment is aimed at strengthening the union with the Toyota group in order to succeed in future international competition.

**Table 3-8 Transition of Supplier's Sales Dependence**

**Suppliers whose sales depends more than 10% on sales for Toyota**

| | 1991 | 1992 | 1993 | 1994 | 1995 | 1996 | 1997 | 1998 |
|---|---|---|---|---|---|---|---|---|
| **Denso** | 54.3% | 52.1% | 50.5% | 48.4% | 47.8% | 46.2% | 44.8% | 45.0% |
| **Tokai Rika** | 62.3% | 60.9% | 58.3% | 57.4% | 57.3% | 57.2% | 59.0% | 60.3% |
| **Koito Seisakusho** | 44.8% | 47.1% | 46.4% | 42.5% | 42.7% | 43.3% | 43.6% | 44.1% |
| **Ichiko Kogyo** | 16.0% | 19.5% | 19.4% | 20.0% | 19.9% | 21.1% | 20.7% | 19.9% |
| **Aisin Seiki** | 67.5% | 65.3% | 63.1% | 60.8% | 56.9% | 57.1% | 57.6% | 57.6% |
| **Aisan Kogyo** | 74.5% | 75.0% | 76.0% | 74.2% | 73.7% | 72.9% | 72.1% | 74.4% |
| **Toyo Radiator** | 13.9% | 17.7% | 18.0% | 18.9% | 19.1% | 18.0% | 18.5% | 18.7% |
| **Nihon Gasket** | 70.5% | 69.6% | 70.9% | 72.2% | 72.8% | 75.0% | 71.3% | 72.9% |
| **Nihon Cable System** | 9.9% | 11.0% | 11.8% | 11.4% | 10.4% | 10.7% | 12.1% | 11.8% |
| **Jidousha Kiki** | 11.6% | 11.8% | 11.9% | 11.2% | 10.1% | 11.7% | 11.4% | 12.1% |
| **Akebono Brake** | 12.7% | 12.0% | 13.1% | 13.1% | 10.9% | 11.2% | 10.9% | 11.2% |
| **Futaba Sangyo** | 55.4% | 58.1% | 58.4% | 56.4% | 55.5% | 55.5% | 52.6% | 54.8% |
| **Shiroki Kogyo** | 48.1% | 49.0% | 48.5% | 46.9% | 45.8% | 47.6% | 46.6% | 44.2% |
| **Owari Seiki** | 23.5% | 25.8% | 26.2% | 26.1% | 25.9% | 26.2% | 26.1% | 26.6% |
| **Taiheiyou Kogyo** | 45.8% | 49.8% | 50.6% | 49.5% | 47.6% | 48.9% | 48.8% | 49.8% |
| **Topi Kogyo** | 10.1% | 11.3% | 10.8% | 10.7% | 10.4% | 11.4% | 11.5% | 13.0% |
| **Nifuco** | 10.0% | 11.4% | 11.8% | 12.1% | 12.9% | 14.2% | 12.9% | 12.7% |
| **Toyota Gosei** | 59.1% | 59.2% | 58.7% | 57.4% | 58.0% | 57.2% | 54.8% | 55.1% |
| **Nishikawa Gum** | 8.1% | 10.1% | 10.7% | 9.2% | 9.2% | 12.9% | 12.4% | 11.2% |
| **Jeko** | 38.8% | 41.8% | 43.7% | 44.0% | 45.6% | 51.5% | 54.4% | 58.0% |

Source: "Jidousha Buhin Sangyou 1999" (Fourin 2000) P.104

**Table 3-8 (continued)**

**Suppliers whose sales depends more than 10% on sales for Nissan**

| | 1991 | 1992 | 1993 | 1994 | 1995 | 1996 | 1997 | 1998 |
|---|---|---|---|---|---|---|---|---|
| **Ichiko Kogyo** | 46.0% | 41.7% | 42.9% | 40.0% | 43.6% | 41.7% | 41.9% | 43.7% |
| **Calsonic** | 76.1% | 75.1% | 75.1% | 71.4% | 72.7% | 71.5% | 73.0% | 68.9% |
| **Nihon Kika Kiki** | 43.9% | 35.1% | 25.5% | 17.3% | 14.5% | 13.4% | 10.4% | 12.6% |
| **Zexel** | 15.3% | 20.7% | 20.8% | 16.9% | 15.4% | 16.9% | 16.8% | 15.4% |
| **Fuji Unibans** | 68.0% | 70.5% | 68.3% | 63.9% | 60.5% | 54.1% | 53.0% | 58.2% |
| **Tochigi Fuji Sangyo** | 43.6% | 39.1% | 39.2% | 36.4% | 34.7% | 35.5% | 31.1% | 32.2% |
| **Unisia Jex** | 77.6% | 75.1% | 76.3% | 74.7% | 74.9% | 75.7% | 71.7% | 69.3% |
| **Kiryu Kikai** | 58.8% | 61.4% | 66.6% | 59.6% | 55.9% | 53.4% | 51.0% | 48.2% |
| **Tokiko** | 24.6% | 24.1% | 24.7% | 25.6% | 27.8% | 25.5% | 25.2% | 24.4% |
| **Akebono Brake** | 16.9% | 17.4% | 15.1% | 12.4% | 12.3% | 12.8% | 12.0% | 11.2% |
| **Hashimoto Forming** | 55.3% | 54.3% | 54.9% | 54.3% | 51.8% | 47.6% | 46.1% | 50.4% |
| **Kinugawa Gum** | 56 2% | 57.6% | 59.1% | 54.8% | 54.8% | 54.2% | 55.9% | 57.7% |
| **Jidousha Denki Kogyo** | 40.3% | 38.6% | 35.6% | 30.9% | 29.5% | 28.5% | 31.4% | 34.7% |
| **Yorozu** | 64.9% | 70.9% | 66.2% | 66.6% | 70.8% | 61.4% | 62.5% | 57.6% |
| **Tachiesu** | 26.0% | 24.9% | 29.0% | 22.0% | 19.3% | 19.0% | 15.9% | 18.9% |
| **Kasai Kogyo** | 64.7% | 65.6% | 72.3% | 70.8% | 74.4% | 70.0% | 68.3% | 62.4% |
| **Fuji Kikou** | 54.5% | 53.3% | 53.4% | 47.3% | 44.8% | 41.8% | 39.1% | 37.2% |
| **Ikeda Bussan** | 62.2% | 61.6% | 63.3% | 63.6% | 68.0% | 68.3% | 65.8% | 68.0% |
| **Kansei** | 68.8% | 67.2% | 65.3% | 58.8% | 65.7% | 67.4% | 66 5% | 65.3% |
| **Tosoku** | 44.9% | 50.9% | 50.0% | 55.3% | 52.3% | 50.3% | 46.0% | 42.7% |

Source: "Jidousha Buhin Sangyou 1999" (Fourin 2000) P.105

**Suppliers whose sales depends more than 10% on sales for Honda**

| | 1991 | 1992 | 1993 | 1994 | 1995 | 1996 | 1997 | 1998 |
|---|---|---|---|---|---|---|---|---|
| **Mitsuba** | 47.5% | 45.6% | 42.6% | 38.8% | 38.5% | 38.6% | 38.6% | 35.9% |
| **Fujisawa Denki** | 31.1% | 33.1% | 34.4% | 37.0% | 38.4% | 39.4% | 43.2% | 49.7% |
| **Stanley Denki** | 23.6% | 23.5% | 21.4% | 18.5% | 19.0% | 21.4% | 21.9% | 21.9% |
| **Kehin** | 73.1% | 69.3% | 67.8% | 63.9% | 62.5% | 64.3% | 71.8% | 68.0% |
| **Nihon Cable System** | 18.6% | 17.9% | 18.5% | 19.5% | 18.5% | 19.1% | 19.3% | 19.1% |
| **Showa** | 51.4% | 50.5% | 59.4% | 54.8% | 54.4% | 60.5% | 61.5% | 58.6% |
| **Tachiesu** | 13.0% | 13.8% | 11.2% | 9.2% | 16.5% | 17.6% | 16.8% | 12.2% |
| **Nishikawa Gum Kogyo** | 12.3% | 12.1% | 11.5% | 11.3% | 14.2% | 13.6% | 14.5% | 14.0% |
| **Sanou Kogyo** | 23.6% | 21.3% | 19.0% | 14.8% | 13.6% | 14.2% | 14.7% | 14.8% |
| **Nihon Seiki** | 33.9% | 34.6% | 33.3% | 25.4% | 21.4% | 22.7% | 20.4% | 19.2% |

Source: "Jidousha Buhin Sangyou 1999" (Fourin 2000) P.105

**Table 3-8 (continued)**
**Suppliers whose sales depends more than 10% on sales for Mazda**

| | 1991 | 1992 | 1993 | 1994 | 1995 | 1996 | 1997 | 1998 |
|---|---|---|---|---|---|---|---|---|
| **Yushin** | 40.5% | 35.8% | 38.3% | 40.3% | 30.8% | 30.5% | 27.9% | 30.5% |
| **Nihon Gasket** | 13.3% | 13.7% | 13.0% | 11.2% | 8.8% | 7.6% | 8.9% | 9.6% |
| **Eksedy** | 14.3% | 15.9% | 14.3% | 12.9% | 10.5% | 11.0% | 10.9% | 10.4% |
| **Nihon Cable System** | 12.3% | 10.8% | 9.7% | 11.0% | 9.5% | 9.6% | 9.3% | 8.5% |
| **Owari Seiki** | 16.6% | 15.2% | 14.9% | 14.8% | 12.5% | 10.7% | 11.5% | 11.8% |
| **Nishikawa Gum Kogyo** | 18.8% | 20.0% | 18.8% | 15.6% | 12.4% | 11.2% | 10.3% | 9.1% |

Source: "Jidousha Buhin Sangyou 1999" (Fourin 2000) P.105

**Table 3-9 Toyota's Investment Ratio in each of the Group Companies**

| Company Name | March 1997 | March 1998 |
|---|---|---|
| **Kanto Auto Works Ltd** | 48.9% | 48.9% |
| **Toyota Body** | 45.2% | 47.1% |
| **Toyota Gosei Co. Ltd** | 42.1% | 42.5% |
| **Toyota Machine Works Ltd** | 22.7% | 24.8% |
| **Toyota Automatic Loom Works Ltd** | 23.1% | 24.7% |
| **Denso Corporation** | 23.0% | 24.7% |
| **Aisin Seiki Co Ltd** | 22.5% | 24.5% |
| **Aichi Steel Works Ltd** | 23.8% | 24.2% |
| **Toyota Tsusho Corporation** | 22.4% | 22.7% |
| **Toyota Boshoku Corporation** | 11.0% | 11.9% |
| **Daihatsu Motor Co Ltd** | 33.4% | 34.5% |
| **Hino Motors Ltd** | 15.6% | 20.1% |

Source: *Kokunai Jidousha Chousa Geppou*, Vol. 6 (Fourin, 1999), pp. 18-21

On the other hand, in its 1999 Revival Plan, Nissan decided to sell off all its *keiretsu* suppliers' stock until 2003, retaining only four companies (Fourin 1999, pp. 8-13). The intent of this decision is to acquire competitive power without depending on *keiretsu* suppliers. As a result of the Nissan pullback, some European and American suppliers (Valeo, Delphi and Johnson Control), aiming at acquiring a production base and new dealings with Japanese automakers, tried to invest in or buy the Nissan *keiretsu* suppliers that had been cut loose (Fourin, 2000, pp. 12-17).

Suppliers should not depend on conventional transactions of goods and services between *keiretsu*. It is necessary for suppliers to adopt a clear strategy to sell their products outside of the *keiretsu*, to develop new products, and to expand their businesses to non-automotive areas. Moreover, each supplier should establish a corporate strategy for survival, such as accepting investment from foreign suppliers and/or mergers with domestic suppliers.

# CHAPTER FOUR

# CHANGES IN MAJOR AUTOMAKERS' PURCHASING POLICIES

## 4.1 INTRODUCTION

The environment of the Japanese auto industry continues to undergo considerable change, as described in Chapters Two and Three. One important response among automakers to this environmental change is significant changes in their purchasing policies. In this chapter, I examine how the purchasing policies among Japan's major automakers' have changed in recent years.

Each Japanese automaker generally holds a meeting with all its suppliers at the beginning of every year. The purchasing policy for the year is explained to all suppliers at the meeting. As part of the purchasing policy, the automaker's requests concerning cost, quality, and technology are clarified. Thus, by analyzing changes in purchasing policies from year to year, we can gain some understanding of the direction automakers are taking.

It is extremely important that suppliers be able to forecast future trends among automakers in order to draw up long-term corporate strategy and to respond to requested changes in the automakers' purchasing policies.

I have chosen four automakers that represent Japan as subjects for analysis and verification. To verify the degree of influence on a foreign automaker's purchasing policy, I selected two companies in which foreign automakers have made a capital investment. The

verification time span was set for five years, from 1996 to 2000. Since the content and form differs greatly with each automaker, I summarized the main points of each company's purchasing policy for every fiscal year. My information comes from materials that were distributed to attendants at the meeting held by the automakers. Note that automakers' names have been changed in order to maintain the confidentiality of the automakers discussed in this chapter.

## 4.2 PURCHASING POLICIES OF AUTOMAKER A

### 4.2.1 Purchasing Policies in 1996

- Make the world's top-rated parts
- Realize global optimum purchasing power
- Establish purchasing organizations in four world "poles": North America, Europe, Asia, Japan
- Improve the management structure of suppliers
- Improve quality

To achieve the goal, "Make the world's top-rated parts," Automaker A asked suppliers to establish corporate systems in the areas of technology, cost, development lead time, etc.

Automaker A needed to strengthen its international supply base in connection with its anticipated internationalization of automobile production locations. The policy that enabled them to realize this goal was "global optimum purchasing power." The policy supplied the best parts in terms of price, technology, and quality to its world production

locations, and it also opened the door for a superior supplier both inside and outside the country for its global purchasing program. Moreover, the policy also asked suppliers to strengthen their management structures by reducing fixed costs, promoting globalization, etc.

### 4.2.2 Purchasing Policies in 1997

- Strengthen the previous year's policy of making the world's top-rated parts
- Strengthen global optimum purchasing power
- Strengthen the domestic supply base

The purchasing policy in 1997 continued the policies from 1996, and continued to ask for powerful promotion. While still desiring to make "the world's top-rated parts", the development of new products also looked forward in the 21st century to developing cutting-edge, low-cost products.

This year's "global optimum purchasing" policy asked suppliers to strengthen their business management of overseas subsidiaries and improve the price and quality of overseas production parts.

The policy of establishing a "domestic supply base" asked suppliers to respond to limited production with a wider variety and more rapid production changes by developing a flexible development and production structure. In addition, it asked first-tier suppliers to guide second-tier suppliers in their response to these business environment changes.

### 4.2.3 Purchasing Policies in 1998

- Make the world's top-rated products by a high-tech injection method and improved competitive costs
- Realize global optimum purchasing through strong mutual trust between suppliers and Automaker A.
- Promote purchasing activities to start production of a new type of a car
- Construct a purchasing system for global deployment
- Train a staff of internationally focused purchasing personnel

By establishing a *de facto* standard and aiming to "make the world's top-ranking products," the policy emphasized earth environment, safety, and technology relevant to advanced information technology.

Given that each supplier aimed to produce the world's top-rated parts, three methods were identified for that purpose: (1) aim to be number one as a system integrator in the field of module parts and system parts; (2) aim to be the supplier of the world's best performing parts; and (3) aim for the world's highest level of manufacturing techniques as a parts supplier.

Automaker A asked suppliers to establish their related strategy for becoming the world's number one.

The most noteworthy feature of the 1998 purchasing policy is Automaker A mentions systematization and modularization for the first time. Automaker A provided the following four points for purposes of systematization and modularization:

1. Shortening of development lead-time
2. Standardization of parts by global parts suppliers

3. Reduction of development cost and administration cost
4. Reduction of assembly cost.

Moreover, the importance of meeting this request for systematization and modularization was suggested to suppliers by explaining the concepts of systematization and modularization, and trends along those lines that were appearing in European and American carmakers.

### 4.2.4 Purchasing Policies in 1999

- Respond to requirement for globalization
- Measure innovative cost reductions
- Reduce fixed costs
- Early realization of key technology
- Promote quality improvement activities

Cost reduction that is not measured in conventional ways or with conventional methods was what this automaker meant by "innovative cost reductions" in its 1999 purchasing policy.

"Early realization of important high technology" emphasized the importance of measuring earth-environment preservation. Specifically, measures for reducing carbon dioxide emissions, improvements in miles-per-gallon, and lighter-weight vehicles were recommended. Moreover, acquisition of the ISO14001 ranking was recommended for all suppliers working with Automaker A.

Automaker A's directive about systematizing and modularizing (originally in the 1998 policies) was further clarified. After the first directive, suppliers may not have

achieved dominance, but Automaker A had. For the second directive, powerful global suppliers were utilized to realize modularization and systematization. Moreover, as this impact of this policy began to attract attention, Automaker A could explain its business promotion and sales promotions to European and American suppliers. It also stimulated Japanese suppliers that already had dealings and added to their understanding of what Automaker A was attempting to achieve.

### 4.2.5 Purchasing Policies in 2000

- Reduce gross costs toward the overall strategic target
- Early realization of new technologies and new products
- Promote quality improvement activities
- Reform purchasing operations

Four activities were mentioned in the policy to "reduce gross costs": (1) standardization and commonization; (2) system development in cooperation with suppliers; (3) optimize global production, and (4) reduce fixed costs.

In the policy of "realizing new technologies and a new products", Automaker A is looking for (1) environmentally responsive technology; (2) safety responsive technology; (3) information communication technologies; (4) new technologies for lightweight vehicles, (5) new functions; and (6) low-cost process. Automaker A expects suppliers to manufacture the best parts in the world and to increase their market share.

The ultimate goal for Automaker A is to manufacture the best automobile for the least amount of cost and in the shortest lead-time. In order to achieve these goals,

Automaker A is strongly promoting these four parts of its purchasing policy in Japan, North America, Asia, and Europe for 2000.

### 4.2.6 Summary of Purchasing Policies for Automaker A

Automaker A's purchasing policies toward suppliers present requirements from several specific perspectives. The new purchasing strategy, including global optimum purchasing, environmental correspondence, and modularization, was introduced prior to being introduced by other automakers. By telling suppliers about new European and American automaker trends and overall future trends in the auto industry, the suppliers were further educated so that preparations for the future were not neglected.

The purchasing policy also referred to strengthening the management structure of suppliers. It seems clear that Automaker A intends to win the global competition by establishing a strong team with its suppliers.

## 4.3 PURCHASING POLICIES FOR AUTOMAKER B

### 4.3.1 Purchasing Policies in 1996

- Establish a competitive cost base
- Promote global purchasing
- Achieve further quality improvements

In order to "establish a competitive cost base", Automaker B promoted cost reductions and functional improvements of parts.

With regard to global purchasing, the company tried to achieve cost reductions and some stability against exchange fluctuations by promoting localization of parts and expansion of parts imports. The automaker aimed to reduce by half the expenses pertaining to quality improvements. In addition, the company asked suppliers to recognize that improvements in quality were the minimum requirement in order to be successful in a highly competitive market.

### 4.3.2 Purchasing Policies in 1997

- Further improve cost competitiveness
- Promote global purchasing
- Further improve quality

The 1997 purchasing policies were almost the same as those in 1996. Three items—cost reduction, quality improvement, and promotion of global purchasing were still emphasized. Future issues, such as prospective new technical developments, were not yet included, no demand were made on suppliers for new technical developments.

### 4.3.3 Purchasing Policies in 1998

- Strengthen global competitiveness
- Further improve quality
- Promote common programs with foreign Automaker E

Automaker B came under the control of a foreign automaker in 1996. The influence of that change on purchasing policy was clear in 1998. With regard to "strengthening global competitiveness," the development of technology needed for cars in the 21st century was

emphasized for the first time. Specifically, development of environment- and safety-responsive technology, and the introduction of modularization and systematization were clarified. Moreover, developing a common platform and power train with Automaker E was announced as part of the "promotion of common programs with Automaker E".

### 4.3.4 Purchasing Policies in 1999

- Make the best parts/units
- Reform supply activities based on optimum global purchasing
- Further improve quality
- Specific promotion of common programs with foreign Automaker E

The 1999 purchasing policies clarified the fact that Automaker B would promote modularization as a part of the policy of "making the best parts/units".

Automaker B's policy for reforming supply activities took into consideration the following three items: (1) responding to environmental and safety problems; (2) responding to Intelligent Transport System (ITS); and (3) working toward modularization and systematization. It was said that this purchasing policy brought the 21st century into view in the cooperation with Automaker E.

### 4.3.5 Purchasing Policies in 2000

- Maintain cost reduction activities at a high level
- Improve quality and promote environmental response
- Introduce a Full Service Supplier system

Since Automaker E sent someone to be the purchasing director at Automaker B, new subjects were emphasized in the Year 2000 purchasing policies. Automaker B announced that the company would stop dealing with suppliers who showed no improvement in quality. It was recommended that suppliers acquire the ISO9001 and ISO14001 rating as quickly as possible.

The Full Service Supplier system came from Automaker E as another result of the takeover. This program is inclusive, even making contracts for parts development, design, and quality guarantees, and a reduction in the number of suppliers is expected as fallout from the implementation of this new program. In addition, personnel exchanges between the purchasing staff of Automaker E and Automaker B were carried out.

One thing is clear—the purchasing methods of Automaker E have largely replaced the methods formerly used by Automaker B.

### 4.3.6 Summary of Purchasing Policies for Automaker B

Relatively simple purchasing policies that contained cost, globalization, and quality components were part of the policies until 1997. After coming under the influence of Automaker E as a result of the takeover, a positive purchasing policy that included introduction of advanced technology and modularization appeared from 1998.

It is highly likely that Automaker B's purchasing policies will henceforth be strongly influenced by the purchasing policies of Automaker E as a result of common programs following the takeover.

## 4.4 PURCHASING POLICIES OF AUTOMAKER C

### 4.4.1 Purchasing Policies in 1996

- Promote cost reductions that go back to the development origin
- Improve the degree of satisfaction of durable quality
- Purchase top-rated parts from the whole world.
- Support independent overseas position in cost, quality, and delivery

Automaker C's purchasing policies in 1996 presumed that cost reductions going back to the origin of development would be promoted further. For Automaker C, cost reductions achieved by a reexamination of design requirements, reducing the number of parts, and establishing optimum specification, were performed for specific cars. Applying this same know-how to another new car was described in the policies.

Improvements in durable quality were emphasized. Moreover, a world information network for parts purchasing was built, and a world-wide purchasing policy was clarified. Support was requested for suppliers working with overseas production locations in North America, South America, Europe, and Asia, in terms of quality, cost, and delivery.

### 4.4.2 Purchasing Policies in 1997

- Reduce costs and improve product value
- Construct a quality assurance organization for overseas positions
- Aim for top-level world-quality, cost, delivery, and development through optimum global production in Asia, Japan, America, and Europe
- Develop environmental improvement technology and advanced safety technology

With regard to cost, the policy asked for improvements in goods value and a simultaneous reduction of cost. About quality, it asked suppliers to transfer know-how about quality improvements already cultivated in Japan to overseas locations so Automaker C could establish a strong quality assurance program in the overseas locations.

Moreover, it asked for a speedy response from suppliers regarding design changes, advanced delivery management, and flexible production so Automaker C could perform global optimum production.

With respect to technology, Automaker C expected to develop environmental improvement technology and advanced safety technology, so expanded development and implementation of creative proposals were recommended to the supplier.

### 4.4.3 Purchasing Policies in 1998

- Promote further development of the quality assurance program
- Simultaneous development and implementation of higher added value and lower cost
- Introduce a full digital development system
- Strengthen local functions
- Establish an advanced information network

The importance of improving quality was emphasized again in the 1998 purchasing policy. Automaker C presumed that quality assurance would be promoted. In particular, the quality of overseas parts did not meet Japanese standards, but it was pointed out that many of the reasons lie with the suppliers; thus the policy asked for improvements in quality in goods produced in suppliers' overseas positions.

With regard to cost, the simultaneous introduction of low cost and high value-added were described. In order to achieve this, Automaker C required the adoption of advanced technology, modularization, and global standard specifications. It was expected that digitization of a development system would shorten the length of the development term, and there would be an informational speedup, information sharing, and improvements in the efficiency of business development.

About global operations, the functional strengthening of overseas positions and construction of an advanced information network were emphasized. Automaker C asked suppliers to ensure that management was able to balance Japan and the overseas locations. It should be noted that Automaker C's views about environmental problems and modularization was clarified as a future directive in the 1998 purchasing policy. Automaker C predicted that intense competition with technical development, diversification of needed technologies, and a strategic alliance would occur concerning the environmental problem.

With regard to modularization, Automaker C noted that it would promote its own modularization by modifying Europe-type modularization with Automaker C's methods. Broad technology was required for that purpose, and it was difficult for one supplier to respond with all the modularization needs. Thus, Automaker C proposed that suppliers promote strategic cooperation.

### 4.4.4 Purchasing Policies in 1999

- A challenge to create innovative high quality
- Make the strongest cost structure in the world to survive competition
- A challenge to cooperate in innovative tasks

- Improve QCD competitive power with digital development
- Establish a market linkage-type production structure
- Reduce environmental concerns for the entire product life-cycle

For Automaker C, a middle term purchasing policy was announced every three years, and the first year of a new middle term purchasing policy came 1999. The following points had to correspond with environmental changes in the automobile industry. First, like the automobile industry at large, competition between automakers was intensifying and market share for automakers and supplier was decreasing. In the area of technical development, competition regarding development of fuel cells, an electronic distribution system, and a lightweight vehicle were intensifying. It was difficult for a supplier to independently respond to these changes, so the need to respond through strategic cooperation was suggested. Furthermore, as a trend in the auto parts industry, it was noted that the market share of large-scale suppliers was increasing every year.

### 4.4.5 Purchasing Policies in 2000

- Implement quality improvements in all vehicles
- Promote powerful cost reductions in Japan, Asia, America, and Europe
- Strengthen cooperation toward developing advanced technology
- Purchase products that are environmentally friendly

There were few differences between the purchasing policies in 1999 and 2000, because the 2000 purchasing policy was based on the 1999 middle-term purchasing policy. In the 2000 purchasing policy, Automaker C clarified its requests to suppliers. It is asked for

a strengthening of the quality assurance system that was promoted through cooperation between Automaker C and suppliers.

It asked for proposals for positive new technology, and promotion of cooperation with other suppliers about advanced technology. Furthermore, introduction of an environmental management system was recommended.

### 4.4.6 Summary of Purchasing Policies for Automaker C

The many-sided and concrete purchasing objectives were shown to Automaker C's suppliers. Direction is clarified in the purchasing policy about environmental improvement technology, advanced safety technology, and modularization. Cooperation and strategic alliances were strongly recommended to suppliers to respond to advanced technical development or modularization. However, although Automaker C educated its suppliers, it also tried to keep a certain distance from suppliers, not taking any initiative toward management improvement of suppliers.

## 4.5 PURCHASING POLICIES OF AUTOMAKER D

### 4.5.1 Purchasing Policies in 1996

- Promote cost reductions
- Improve quality
- Implement global optimum purchasing
- Strengthen development power

Cost-reduction programs were promoted in an effort to reduce costs. Reducing market claims about quality was also promoted.

Regarding global optimum purchasing, the policy emphasized purchasing parts that had competitive international price power according to world economic market principles. Moreover, shortening the development lead-time and attractive product development were also stressed.

### 4.5.2 Purchasing Policies in 1997

- Become "competitive power #1" in parts and price
- Implement measures for global optimum purchasing
- Improve quality assurance
- Shorten development term

With the 1997 purchasing policy, a concept called "competitive power #1" appeared. This meant parts with the quality, price, and performance that exceeded the level of other parts suppliers. Automaker D asked its suppliers to supply competitive power #1 parts in order to create attractive automobiles.

Regarding global optimum purchasing, this policy indicated that Automaker D wanted suppliers to become a partner with Automaker D by building global development and manufacturing power.

As for quality assurance, Automaker D asked suppliers to consider quality assurance issues when they developed parts.

About development, in order to stay abreast of rapid changes in the market environment and customer needs for development, and to produce in a new product in the

shortest time frame, Automaker D said they were promoting the shortening of development lead time.

### 4.5.3 Purchasing Policies in 1998

- Promote a mid-term cost reduction plan
- Improve quality assurance power
- Achieve a price level appropriate as competitive power #1
- Develop greater power and shorten development lead time
- Promote global optimum purchasing

The purchasing policy for 1998 was almost the same as that of 1997. However, with regard to developing greater power, new technical proposals for lightweight vehicles, miniaturization, and a miles-per-gallon improvement were encouraged from suppliers. In addition, a proposal for systematization and modularization was also recommended.

### 4.5.4 Purchasing Policies in 1999

- Promote thorough cost reduction
- Encourage early realization of next-generation technology
- Promote quality improvement activities

In the 1999 purchasing policy, cost is positioned as the highest priority. For cost reduction, suppliers were invited to reexamine conventional specifications and consider cost reductions through modularization.

Development of new-generation technology in the areas of earth-environment, ITS, and modularization were specified, with requests for specific proposals from suppliers.

Moreover, it was assumed that cooperation from suppliers would be needed in order to develop such new technology, and this was recommended.

### 4.5.5 Purchasing Policies in 2000

- Reduce purchasing costs
- Pursue program of intensive purchase of raw materials for parts
- Reduce the number of suppliers
- Enter into partnerships with competitive global suppliers
- Establish specifications and a standard
- Establish an alliance with Automaker F

Automaker D entered into an alliance with Automaker F in 1999. Automaker D's restructuring plan was announced by leadership sent from Automaker F. The 2000 purchasing policy was part of the restructuring plan.

As for cost reductions, Automaker D strove for reductions of 8 % in 2000, 7% in 2001, and 6.5% in 2002.

Purchasing that was currently done by area and by country was centralized and globalized. In addition, the number of supplier at that time (1145 companies) will be reduced to 600 or fewer companies by 2002.

Partnerships with global suppliers that were based on excellence in quality, cost, technology, and delivery time were promoted.

Superfluous parts specification and a superfluous part standard were reexamined and improved.

Finally, economies of scale were pursued through common purchasing, common specifications, and a common supplier in cooperation with Automaker F. Thus, a concrete and decisive purchasing policy was carried out.

### 4.5.6 Summary of Purchasing Policies for Automaker D

The purchasing policies for Automaker D were simple ones consists of items such as cost, quality, development power, and global purchasing from 1996 until 1998. Although the concept of "competitive power #1" parts appeared 1997, in actuality this was similar to world-ranked #1 parts which Automaker A had adopted in 1996.

In 1999 Automaker D faced a management crisis, at which point cost reduction became the highest priority. After entering into an alliance with Automaker F, a severe purchasing policy that included 20% purchase cost reductions over three years and a decrease of half the number of suppliers was undertaken in order to achieve management reconstruction. It is expected that the purchasing policy of Automaker F will have a major influence on the purchasing policies of Automaker D from now on.

## 4.6 COMMONALITIES IN PURCHASING POLICIES AND EXPECTATIONS FOR SUPPLIERS

Although there are differences in priorities and a difference approaches to the introductory timing of a purchasing policy for every automaker, it is also apparent that, on the whole, there are many commonalities among these automakers' policies. Some of these common subjects in purchasing policies and automakers' expectations of their suppliers are discussed below.

*1) Continuous cost reduction*

- Low parts price as the most important element when selecting a supplier
- Continuous improvement in parts function, quality, and cost
- Cost reductions through modularization and systemization

*2) Continuous quality improvement*

- Continuous improvement of manufacturing quality
- Development of the parts that make it easier to ensure quality
- Improvement in parts quality from suppliers' overseas factories by transferring quality control know-how

*3) Global optimum purchasing*

- Establishing a parts supply structure in the four poles of the business world (Japan, America, Europe, Asia)
- The transfer of manufacturing technology know-how, quality control, and production control to the suppliers' overseas factories from Japanese head office suppliers
- The transfer of business management know-how to suppliers' overseas factories and training of local talented personnel by Japanese head office suppliers

*4) Develop products to meet need for environment-responsive and advanced technology*

- Promote new technical proposals to automakers
- Strengthen the supplier's original technology
- Strengthen technical development power through cooperation and alliance with other suppliers

*5) Promote programs of modularization and systemization*

- Strengthen of the supplier's original technology
- Clarify a strategy with each supplier for modularization and systematization
- Participate in modularization and systematization through cooperation and alliances with other suppliers

Every automaker's purchasing policy is established not just for establishing requests and purchasing guidelines to suppliers. When major changes occur in the future, automakers may very well sound an alarm to suppliers with regard to their purchasing policies. Through an established purchasing policy, many automakers can suggest the prospective direction of trends in the auto industry and educate suppliers.

Therefore, it is very important that suppliers be able to predict an automaker's purchase activities so the suppliers strive to align themselves with the automakers by analyzing purchasing policies.

# CHAPTER FIVE

# FUTURE DIRECTION FOR JAPANESE AUTOMOTIVE SUPPLIERS

## 5.1 INTRODUCTION

Based on the discussion in Chapters 2, 3, and 4, I can now examine what I believe is required in order for Japanese automotive suppliers to maintain or expand their businesses in the 21st century by responding to environmental changes in the auto industry as well as changes in the relationships between automakers and suppliers.

Based on my earlier analysis and discussion, the following are subjects that suppliers must consider:

1. Strengthen cost competitive power and quality assurance capability
2. Strengthen research-and-development power
3. Establish measures for modularization and systematization
4. Establish a global management system
5. Promote strategic alliances.

I will discuss each of these problems from the perspectives of the automakers requests to suppliers, the problems suppliers encounter, and measures to deal with these issues.

## 5.2 STRENGTHENING COST COMPETITIVE POWER AND QUALITY ASSURANCE CAPABILITY

Japan's major automakers continually examine and change their purchasing policies, as was confirmed in Chapter Four. That analysis showed that continuous improvement was demanded at all times by all automakers, particularly with regard to cost and quality. In order to succeed in the harsh competition with U.S. and European automakers in the global market, the simultaneous creation of low cost and high quality are minimum requirements. Therefore, suppliers who desire to establish long-term dealings with automakers will need to meet these demands for quality and cost.

When an automaker selects a supplier, low cost and high quality are the most important conditions. If cost and quality are comparable, then which is most important? If it comes to that point, cost becomes more important thereafter. It is generally said that Japanese auto parts are among world's best, therefore high quality is already a precondition, and it is harder for a supplier to differentiate itself from other competitors only on the basis of quality. But a high-quality supplier that can also supply low-priced parts obviously has an edge and will undoubtedly be able to maintain and expand its business. Moreover, the automaker that purchases low-priced parts is more likely to remain at the top in international competition.

The cost reductions that automakers ask for are significant, and in addition automakers ask for improvements in the parts function simultaneously with cost reductions. As described in Chapter Three, automakers have imposed on suppliers severe cost reduction targets, such as a 30% reduction for three years, or a 20% reduction for three years. This level of reduction in manufacturing costs cannot be attained simply by improving

manufacturing processes like before. Suppliers are now required to make fundamental changes in their ways of thinking, such as reexamining designs, consideration of raw materials, and reexamination of manufacturing locations.

In addition to VA/VE, which was the typical technique suppliers used in the past to achieve cost reduction, it is now necessary to promote cost reduction by requesting cost reductions to second-tier and third-tier suppliers, or in some cases changing suppliers altogether.

It has also become critical to improve the manufacture of parts and add more functionality by promoting modularization and systematization because there is no longer any room for cost reduction among single parts. Although every supplier has already promoted cost reductions by increasing management efficiency, it will be necessary to plan additional reductions by reducing the number of development projects and trimming excess personnel.

With regard to quality assurance, automakers not only require suppliers to improve quality in parts manufacturing but also to develop parts that are easy to assure quality in cooperation with other automakers. It will be necessary for suppliers to reflect quality assurance know-how in the conventional manufacturing process of parts design and development. Furthermore, automakers will ask suppliers to attain levels of quality equivalent to Japan at overseas factory locations in connection with increases overseas production by automakers. Suppliers should establish strong management capability at their overseas factories and understand how to transfer technology that will enable them to achieve the same level of quality in their overseas factories—where language, culture, and the local infrastructure are different—as is currently being achieved in Japanese factories.

## 5.3 STRENGTHENING OF R&D POWER

I have confirmed that automakers' needs for environmentally responsive technology and information communications-related technologies are increasing dramatically. Owing to changes in such technical needs, new entries into the auto parts market by electronics, electricity, and communications-related companies may also be encouraged.

In addition, my research confirmed that design and development technology and evaluation capability are becoming more focused on modular and systematized parts than the technology and evaluation capability for single parts.

With careful attention to the following three points, suppliers will be able to strengthen their development power to respond to such environmental changes.

- First, strengthening the technology of a product field is crucial. Specifically, establishing an enterprise base and high added value are achieved by securing technical advantage in the specific field. Suppliers should pursue the core technology of the product thoroughly, and when the strong and weak points are understood, suppliers can then develop prospective new technologies and a new product based on this understanding. Suppliers should also strengthen their core technology through a strong injection of development capital into the initial R&D.
- Second, it is necessary to acquire knowledge of the technologies surrounding a core technology or core products. The technology required for parts development changes with developments in modularization and systematization; indeed there are significant differences in the technology of single parts from the technology of the

whole system. Therefore, suppliers must understand and be able to evaluate core technology and the surrounding technology relevant to the core product.

- Third, suppliers should be prepared with substitute technology to replace the core technology if needed. As described in Chapter 3, the fuel cell car has the possibility of completely changing the power system of cars in the future. In such a case, many parts in the conventional internal combustion engine will no longer be in demand. This is an example where rapid change and rapid development of automobile-related technology will likely occur from now on. Automakers that discern the possibility and respond by developing prospective substitute technologies and products will also decide the fate of suppliers. Research and development should be based on long-term views of whether a supplier will withdraw from a present core product, or whether they will develop a substitute product by themselves, or whether they will develop a substitute product through an alliance or cooperative venture with other suppliers.

## 5.4 MODULARIZATION AND SYSTEMATIZATION

Modularization, begun by European automakers, is a strong trend in the world auto industry today. This trend includes the possibility of progressing to a system that places an order for development of an entire module from two or more suppliers with one company of specific suppliers in the future. In Japan, where the supplier system are different from Europe and the U.S., automakers were prudent in adopting modularization from the beginning. However, Japan's main automakers deal with modularization in a different form,

as seen in Chapter 4. A Japanese automaker who enters into an alliance of some kind with a European or American automaker may find their purchasing policies changed due to the module used a European and American product. Moreover, by improving the design per module, innovations that were not in the former product may be produced.

The competitive power of Japanese suppliers in the international parts market will be lost if Japanese suppliers do not advance their measures for modularization. Preparation for modularization and systematization is a subject that cannot be bypassed for suppliers. When promoting modularization, it is necessary for suppliers to make their position clear about the following three points:

- First, suppliers need to determine what strategy each automaker is going to take regarding modularization, and thence to the parts supplied by a supplier. Even if a big trend toward modularization becomes common, individual strategies may differ for every automaker. Suppliers will be required to discern each automaker's strategy and then position themselves to respond.
- Second, it is necessary for each supplier to discern whether their parts, technology, and management resource are most suitable as a module supplier or a single parts supplier. If a role as module supplier is chosen, the supplier has overwhelming technical power with the major parts which lead the module, and technology and quality can fully be evaluated regarding the composition parts of the module. Moreover, talented personnel and enough fund are indispensable because of significant equipment investment and related technology.
- Third, for a supplier to be a module supplier, it needs to discern the cooperating company which complements the resources of the supplier. On the technical side,

what cannot be handled with the supplier's existing technology needs to be acquired through cooperation with the other company or through purchase. Moreover, the complementary production function is also important. For example, in order to respond to an automaker's global purchasing policy, it is necessary to have a worldwide production base, which requires a major capital investment. If there is no production capacity—even if there is technology corresponding to the module—it cannot respond to an automaker's needs. So it is worth planning and encouraging a supplemental relationship between a supplier with strong technology and weak production capacity and a supplier with weak technology and strong production capacity. What pairs will emerge from the various choices available for building supplemental relationships? Success depends on each supplier's strategy.

## 5.5 ESTABLISHING A GLOBAL MANAGEMENT SYSTEM

Japanese main automakers attach considerable importance to global optimum purchasing as one of their purchasing policies, as seen in Chapter Four. While domestic automobile production is currently in a long-term declining trend, overseas automobile production by Japanese automakers is increasing. In order for a supplier to maintain the expansion of its business, it is necessary to acquire a stable business with Japanese automakers' in their overseas production locations. Therefore, after the 1980s, most suppliers quickly began promoting overseas deployment.

In connection with overseas deployment, suppliers need to establish a global management capability. Automakers are asking suppliers to guarantee the same price,

quality, and technology in the products that are supplied from overseas factories. Therefore, suppliers need to understand how to transfer quality assurance capability, production control, and manufacturing technology to the overseas factory for short periods of time. Suppliers need to build a strong management system that includes personnel and purchase management, as well as construct an international management system in which the supplier in the head office in Japan manages the worldwide overseas subsidiaries.

However, such multinational management cannot be operated smoothly simply by constructing a management system. In fact, suppliers must station talented personnel who can handle a multinational enterprise both in the Japanese head office and in an overseas subsidiary. Therefore, it is necessary to develop and train such talented persons. Furthermore, as a global supplier, it may be necessary to change the company organization in order to utilize management resources for maximum efficiency.

The auto industry is an industry in which internationalization has made significant progress. Internationalization is indispensable in order for suppliers to respond to automakers' global purchasing. Suppliers are required to recognize the risk of foreign investment in order to attain global optimum development and global optimum production.

## 5.6 PROMOTING STRATEGIC ALLIANCES

In recent years, automakers have demanded that suppliers respond to requirements for advanced technology, modularization, systematization, and global purchasing. It has often proven difficult for suppliers to respond to these demands within the framework of a

single company. Strategic cooperation has proven to be one means of complementing the management resources that may be required to achieve the automakers' demands.

The first method of strategic cooperation is merger and acquisition (M&A). M&A is an effective method when utilizing a company's capital and international position, in addition to various management resources. If advanced technology, modularization, systematization, and global purchasing are considered, it can be said that M&A is one method for maximizing management resources. However, it is runs the risk of producing friction within the management of a new organization after M&A, and their expectations may not be fulfilled. Moreover, there may also be problems such slowed decision-making speed owing to the expanded size of the company, which is generally not advantageous.

The second method of alliance is through some form of cooperation, business tie-up or alliance with others. This method mutually complements insufficient resources by partial cooperation that includes some form of capital tie-up. This method also has the advantage of flexibility in responding to change in a situation without requiring a full-scale expansion. It is considered the most realistic technique for building various cooperative relations, and for strengthening core technology and a core product—especially if the speed of change in the present auto industry is considered.

Ultimately, the selection of a cooperative method and a partner is only the first step in a strategic alliance. It is crucial to establish the best method and structure for the new organization after an M&A. It is also important to run the new organization without friction and to maximize synergies between each asset and resource. Differences in culture may also become a source of friction in some cases. This is especially true if one of the partners is a

Japanese company with its inherent unique cultural system, in which case it will be necessary to carefully consider all aspects of such an alliance.

# CHAPTER SIX

# CONCLUSION

In this thesis, I have offered an outline of the future direction Japanese suppliers may wish to go in order to survive, maintain, and expand their business by responding to rapid changes in the Japanese auto industry.

In developing this framework, the situation of the present auto industry, the situation of auto parts industry, various environmental changes in the auto industry, and changes in automakers' purchasing policies were analyzed. These led to Chapter Five where I discussed a set of balanced responses for suppliers:.

- Strengthening their cost competitive power and quality assurance capability
- Strengthening their R&D power
- Establishing measures for modularization and systematization
- Establishing a global management system
- Promoting strategic alliances

However, it must be said that there is probably no supplier that can promote all of these items itself. Michael. E. Porter wrote that the choice of what should and should not be done is a key part of corporate strategy (Porter, 2000). Selection and concentration are basic concepts of corporate strategy. In order for a supplier to survive and succeed in severe international competition, it must establish a stable position of dominance in one's most related field. It is likely that strategic alliance is not possible without such a core competence.

The most important thing for each supplier is to clarify what is the supplier's core competence, what the supplier can do by itself, and what the supplier should procure from outside. In other words, it is necessary for each supplier to strengthen its strong points and reinforce its weak points through strategic alliance with others.

In order to continue attaining excellent achievements in the company, both strategic and operational efficiency are indispensable. However, it has become almost a matter of course to investigate operational efficiency because it is now regarded as a best practice that has spread all over the world. However, excellent achievements cannot be attained only through operating efficiency. Attempting to succeed on strategy alone is what separates the winners from the losers (Porter, 2000, p.141).

In order to implement strategy at a high level when another company is also involved, the role of top management becomes enormous. It is necessary for top management to have both the function that pursues operation efficiency and the function that creates and executes corporate strategy. Many Japanese companies already have resource such as talented personnel, corporate culture, know-how, skills, and teamwork. What is missing is the power to think strategically, to utilize valuable corporate resources, and to connect them to customers and international competitive power (Nobeoka, 2000).

Today, every automaker is promoting its own unique strategy worldwide. It is difficult for suppliers to respond to every automaker's strategy individually. However, if a supplier can manage to both establish and strengthen its core competence and at the same time develop a corporate strategy and operating efficiency, then it is responding sufficiently to the five item discussed above, and that supplier should ultimately be able to achieve

success in the 21st century—whether in a time of prosperity or severe international competition.

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