

# Influence Analysis in the Keiretsu of Mazda

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## ABSTRACT

*One of the most important issues in Customer Relationship Management (CRM) is how to measure the relationship with customers. More research into quantitative approaches to this measurement is needed. To help consider this issue, the reciprocal relationship between the automobile maker Mazda and its suppliers is analyzed and the results presented in this paper. This set of interlocking business relationships is known as a keiretsu. This paper uses the influence analysis tool DEMATEL (DEcision MAKing Trial and Evaluation Laboratory), to measure one kind of reciprocal relationship, the influence, of each firm in the keiretsu of Mazda Yokokai. The results of this analysis are used to identify some characteristics of effective relationships between Mazda and its suppliers.*

**Keywords:** influence, relationship, cross-shareholdings, transactions, DEMATEL

## 1. INTRODUCTION

A keiretsu is a set of companies with interlocking business relationships. In the Japanese automobile manufacturing industry, these relationships include cross-company transactions and cross-shareholdings between automobile manufacturers and companies supplying their parts. A keiretsu can be considered as a type of network organization. In the automobile manufacturing industry, the competition between manufacturers is substantially the competition between the keiretsu of manufacturers. Generally speaking, from 60 percent to 70 percent of the cost of each vehicle is derived from the cost of auto-parts. The remaining costs are labor, equipment costs, and various other costs such as advertising and distribution. For different automobile manufacturers, for each vehicle with the same displacement volume, the selling price, wages of employees, and the price of raw materials, are approximately the same. Consequently almost all of the profit is generated from the reduction in costs of the parts obtained from suppliers. Hence, one kind of reciprocal relationship, the influence between the manufacturer and its suppliers, is a key competitive factor in the industry. The aim of this paper is to use the influence analysis tool DEMATEL (DEcision MAKing Trial and Evaluation Laboratory), to measure the influence of each firm in the keiretsu of Mazda Yokokai and hence uncover the effective structural relationships between suppliers and the automobile manufacturer.

The structure of this paper is as follows: In Section 2 the authors briefly review some previous studies of relationships; Section 3 introduces and applies the DEMATEL measurement technique, showing the result of the influence of each firm in the keiretsu of Mazda; An analysis and discussion of the implications of the measurement results are presented in Section 4. The final section (Section 5) contains some concluding remarks.

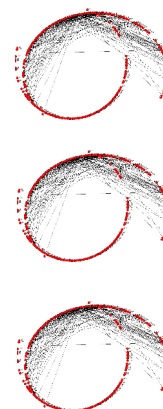
## 2. BACKGROUND

There are many kinds of reciprocal relationships that can be considered. Dyer analyzed the relationship between firms based on distances between their loca-

tions and the frequency of face-to-face communication among engineers in the automobile industry (Dyer, 1994, 1996). Bensaou identified the successful portfolios of buyer-supplier relationships from the viewpoint of effective supply-chain management (Bensaou, 1999). Ito measured the firm's relationship in the keiretsu of Toyota from the viewpoint of centrality (Ito, 2004). Ito and Sakamoto developed a new method to calculate the importance of each individual firm in the keiretsu of Toyota and Nissan (Ito and Sakamoto, 2005). Recently, inter-organizational relationships in keiretsu have been analyzed with quantitative analysis tools such as CONCOR (Lincoln and Gerlach, 2004). Fukuoka et al reported a new trend in relationships between firms in the keiretsu of Nissan from the viewpoint of network organization (Fukuoka et al, 2006). All of these researchers focused on the relationship of each firm in the keiretsu. However, there are only a few empirical studies that analyze reciprocal relationships between the firms in the keiretsu (Nohria and Eccles, 1992; Hakansson and Waluszewski, 2002). One kind of reciprocal relationship is the level of influence between firms. Measuring this level of influence helps to identify effective relationships between firms.

## 3. MEASUREMENT

Influence is a term that refers to the power to indirectly control or affect the actions of other persons or things. In the social sciences, influence derives from an interpersonal relationship, and most research into influence is based on a psychological approach. Fontela and Gabus (1976) developed a tool for analyzing influence networks called DEMATEL, which is an abbreviation for DEcision MAKing Trial and Evaluation Laboratory. DEMATEL is an approach for identifying the influence or the hidden or indirect power of a group of relationships, based on the principle "Friends of my friend are my friends". In this current research, DEMATEL is used as a new method to measure the influence of actors within the keiretsu of Mazda Yokokai.



**3.1 Outline of DEMATEL**

A brief overview of the mathematical basis of DEMATEL is as follows.

In a social network composed of  $n$  actors, the binary relation between each actor and the strength of this binary relation can be identified. Based upon the structure of this pattern of reciprocal relationships, an  $n \times n$  adjacent matrix  $A^*$  can be obtained. The first step in the analysis is to normalize this matrix by multiplying each element of  $A^*$  by  $1/l$ , the largest row sum of  $A^*$ . The normalized matrix  $A = 1/l A^*$  is therefore obtained. The  $(i, j)$  element of  $a_{ij}$  of this matrix denotes the level of direct influence from actor  $i$  to actor  $j$ .

The reachable matrix, denoted by  $A^x$ , refers to the fact that actor  $i$  can reach actor  $j$  through the number of steps  $x$ . For instance,  $A^2$  means that actor  $i$  can reach actor  $j$  through 2 steps. Therefore  $A^x$  measures the indirect influence from actor  $i$  to actor  $j$ . All of the levels of indirect influence can be summarized as follows, which the authors refer to as the indirect matrix.

$$A^f = A^2 + A^3 + \dots + A^n = A^2(I - A)^{-1}$$

The total influence matrix, which includes both the direct and indirect influence matrix, can therefore be expressed as follows.

$$T = A + A^f = A + A^2 + A^3 + \dots + A^n = A(I - A)^{-1}$$

**3.2 Data Collection**

In order to measure this pattern of influence, data showing the transactions and cross-shareholdings in the keiretsu of Mazda Yokokai were collected from the publications of the Japan Auto Parts Industries Association and Automotive Parts Publishing Company (JAPIA&ATJC, 2005). In 2004, the number of firms involved in transactions and cross-shareholdings was 181 and 223 respectively. This data set makes up about 42 percent of the complete set of transactions between Mazda and other firms.

The relationships between the firms in each category were identified through graph modeling. A tie shows the presence or absence of transactions or cross-shareholdings between each pair of firms. The authors collected directed 0-1

Figure 1. Relationship graph of transactions of Mazda Yokokai in 2004

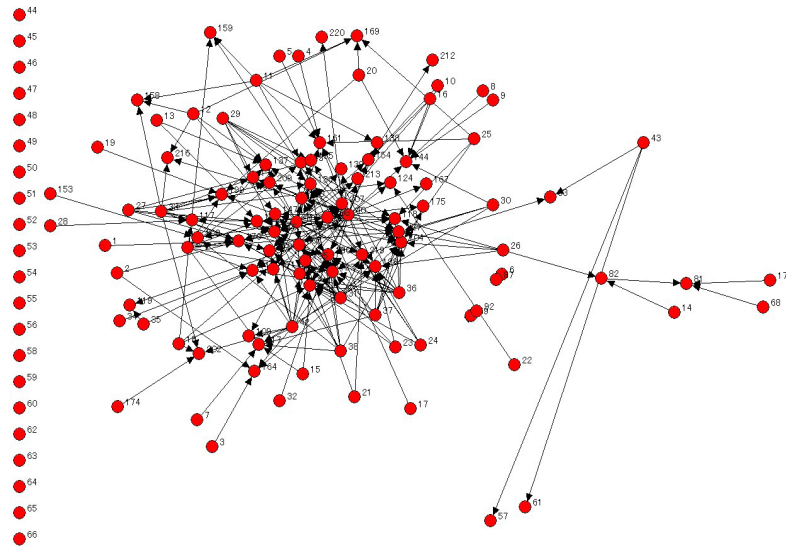
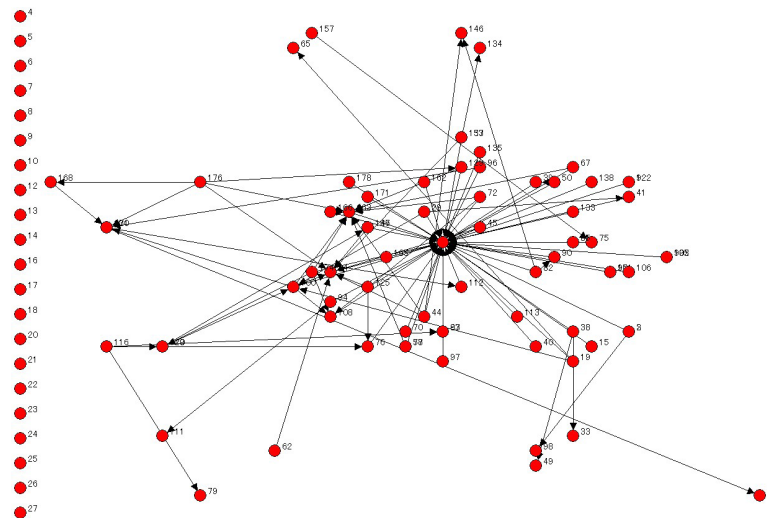


Figure 2. Relationship graph of cross-shareholdings of Mazda Yokokai in 2004



relationships to model the influence of each firm. The network of transactions in the Mazda keiretsu is shown in Figure 1, and the network of cross-shareholdings in the Mazda keiretsu is shown in Figure 2. The numbers in both Figures 1 and 2 refer to various companies in the keiretsu. The list of company names is provided in Appendix I.

**3.3 Influence Measurement**

Using a computer program developed by the authors, the influence of each firm in the Mazda keiretsu was calculated. The result of the influence of transactions is shown in Figure 3.

Figure 3 shows that the influence from Mazda to other suppliers is zero, but the influence from other suppliers to Mazda is quite high. Figure 4 shows the influence from other suppliers to Mazda in more detail. The total influence from other

suppliers reaches 5.46. This shows Mazda received many parts from suppliers. The influence of cross-shareholdings was calculated using the same method. The influence from Mazda to other suppliers is 0.50, but the influence from other suppliers to Mazda is zero.

The results of this analysis clearly show that Mazda has investments in many of the companies that supply its parts, and consequently receives many parts from these suppliers.

**4. ANALYSIS AND IMPLICATIONS**

The finding that the more investment that Mazda makes in its supplier firms the more transactions Mazda will have with them, is not an unexpected result. The question that can now be asked is: "How strong is this relationship between level of investment and number of transactions?" To answer this question, the correlation coefficients between transaction and cross-shareholdings were calculated. The results of this analysis are shown in Table 1.

This analysis shows that two correlations, that between influence B of transactions and influence A of cross-shareholdings, and that between influence A of

Figure 3. Transactional relationships in the Keiretsu of Mazda Yokokai

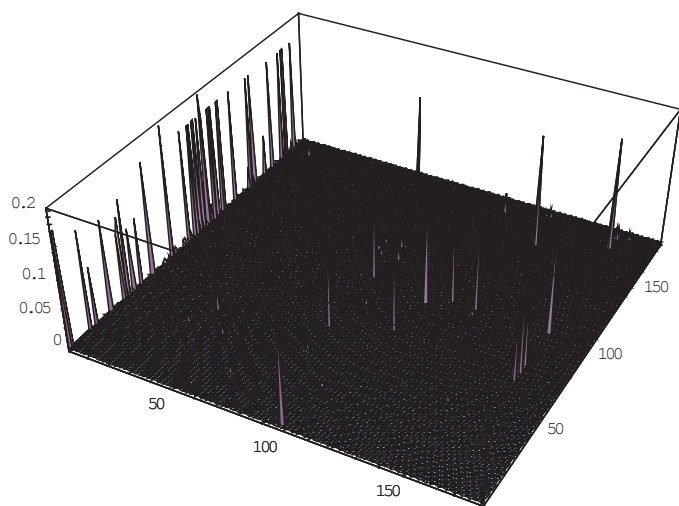


Figure 4. Influences from other suppliers to Mazda

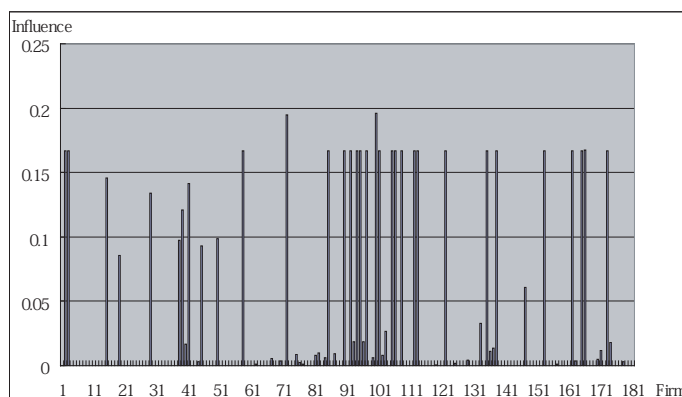


Table 1. Matrix of correlation coefficient between transaction and cross-shareholdings

|                      |             | Cross-shareholdings |             | Transaction |             |
|----------------------|-------------|---------------------|-------------|-------------|-------------|
|                      |             | Influence A         | Influence B | Influence A | Influence B |
| Cross- shareholdings | Influence A | 1                   | 0.030       | 0.039       | 0.678**     |
|                      |             | -                   | 0.687       | 0.604       | 0.000       |
|                      | 181         | 181                 | 181         | 181         |             |
|                      | Influence B | 1.000               | 0.399**     | -0.033      |             |
| -                    |             | 0.000               | 0.660       |             |             |
| 181                  | 181         | 181                 | 181         |             |             |
| Transaction          | Influence A | 1.000               | -0.036      |             |             |
|                      |             | -                   | 0.633       |             |             |
|                      | 181         | 181                 |             |             |             |
|                      | Influence B | 1.000               |             |             |             |
| -                    |             |                     |             |             |             |
| 181                  | 181         |                     |             |             |             |

\*\*p < 0.01

Note: The first layer is the Pearson's correlation coefficient; the second layer is the probability (two-side test), and the third layer is the sample size. Influence A means actor i directly influences actor j; and Influence B means actor i is influenced from actor j.

transactions and influence B of cross-shareholdings, were significant ( $p < 0.01$ ). The correlation values were 0.678 and 0.399 respectively, which shows that a strong relationship exists between the level of transactions and cross-shareholdings. In other words, the statement that “the more a firm invests in a supplier, the more the firm receives parts from that supplier” is valid. The reciprocal finding that “the higher level of investment that a firm accepts, the more parts that firm will supply” is also valid.

## 5. CONCLUSIONS

In this paper, the influence of each firm was measured in order to investigate the pattern of relationships in the keiretsu of Mazda. The study found that the influence of cross-shareholdings in other firms is closely related to the influence of the transactions between them. This means that the higher influence of cross-shareholdings has a strong impact on the influence of transactions. The implication of this finding for the automobile manufacturer Mazda is that an important strategy for them is to find those firms that have higher influence in the keiretsu and strengthen their reciprocal relationship with them.

One limitation of the paper is that the data of transactions and cross-shareholdings in this analysis are restricted to one fiscal year. Data from more years would be required in order to more completely study the trend of these identified influences through time series analysis. In addition, the form of influence investigated in this study is only one aspect of the reciprocal relationship between an automobile manufacturer and its supplies. Further quantitative research, such as the use of capacity analysis between two actors and clique analysis of the network structure, will be undertaken in the future, to attempt to capture the complexity of the relationships in the keiretsu of Mazda.

## ACKNOWLEDGMENT

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## APPENDIX I: KEIRETSU MEMBERS SHOWN IN FIGURES 1 AND 2

| No.* | No.# | Company                                     | No.* | No.# | Company                                |
|------|------|---|------|------|--|
| -    | 1    | The Daishi Bank,Ltd.                        | 71   | 113  | N.E.CHEMCAT CORPORATION.               |
| -    | 2    | Mitsui Trust Holdings, Inc.                 | 72   | 114  | NOK CORPORATION                        |
| -    | 3    | TAIYO LIFE INSURANCE COMPANY                | 73   | 115  | ENKEI Corporation                      |
| -    | 4    | The Ashikaga Bank,Ltd.                      | 74   | 116  | Autoliv, Inc.                          |
| -    | 5    | SECOM General Insurance                     | 75   | 117  | KYB Co.,Ltd.                           |
| -    | 6    | The Yamaguchi Bank, Ltd.                    | 76   | 118  | CALSONIC KANSEI CORPORATION            |
| -    | 7    | Nissei Dowa General Ins.                    | 77   | 119  | Kyosan Denki Co.,Ltd.                  |
| -    | 8    | Saitama Resona Bank, Limited                | 78   | 120  | Kyowa Leather Cloth Co.,Ltd.           |
| -    | 9    | Nisshin Fire & Marine Insurance Co.,Ltd.    | 79   | 121  | Clarion Co.,Ltd.                       |
| -    | 10   | ASAHI MUTUAL LIFE INSURANCE CO.             | 80   | 122  | Continental Teves AG & Co.             |
| -    | 11   | The Bank of Yokohama, Ltd.                  | 81   | 123  | KOITO MANUFACTURING CO., LTD.          |
| -    | 12   | Mizuho Bank, Ltd.                           | 82   | 124  | Sanoh Industrial Co.,Ltd.              |
| -    | 13   | Fukoku Mutual Life Insurance Company        | 83   | 125  | SANYO Automedia Co.,Ltd.               |
| -    | 14   | The Hiroshima Bank, Ltd.,                   | 84   | 126  | JATCO Ltd.                             |
| -    | 15   | Tokio Marine & Fire Insurance Co., Ltd.     | 85   | 127  | SHOWA Corporation.                     |
| -    | 16   | Shinsei Bank, Limited.                      | 86   | 128  | Shin-Kobe Electric Machinery Co., Ltd. |
| -    | 17   | Mizuho Trust & Banking Co.,Ltd.             | 87   | 129  | STANLEY ELECTRIC CO., LTD.             |
| -    | 18   | Aioi Insurance Co., Ltd.                    | 88   | 130  | VALEO THERMAL SYSTEMS JAPAN            |
| -    | 19   | DAIDO LIFE INSURANCE COMPANY                | 89   | 131  | CENTRAL GLASS co.,Ltd.                 |
| -    | 20   | Nichido Fire & Marine Insurance Co., Ltd.   | 90   | 132  | TAKATA Co.,Ltd.                        |
| -    | 21   | Sumitomo Life Insurance Company.            | 91   | 133  | TRAD CORPORATION.                      |
| -    | 22   | The Jyo Bank, Ltd.                          | 92   | 134  | TOKYO ROKI co.ltd.                     |
| -    | 23   | Mitsui Sumitomo Insurance Company, Ltd      | 93   | 135  | GKN Driveline Torque Technology KK     |
| -    | 24   | Resona Bank, Limited.                       | 94   | 136  | TOPY Industries Ltd.                   |
| -    | 25   | Mitsubishi Trust and Banking Corporation    | 95   | 137  | Nisshinbo Industries,Inc.              |
| -    | 26   | The Sumitomo Trust & Banking Co., Ltd.      | 96   | 138  | Nittan Valve Co.,Ltd.                  |
| -    | 27   | SOMPO JAPAN INSURANCE INC.                  | 97   | 139  | Nifco Inc.                             |
| -    | 28   | Meiji Yasuda Life Insurance Company         | 98   | 140  | Nippon Sheet Glass Co., Ltd.           |
| -    | 29   | Trust & Custody Services Bank, Ltd.         | 99   | 141  | NIPPON THERMOSTAT CO.,LTD.             |
| -    | 30   | UFJ Trust and Banking Corporation           | 100  | 142  | NSK Ltd.                               |
| -    | 31   | Nippon Life Insurance Company               | 101  | 143  | NHK SPRING CO.,Ltd.                    |
| -    | 32   | Tokio Marine & Nichido Fire Insure Co. Ltd. | 102  | 144  | NIPPON PISTON RING CO.,LTD.            |
| -    | 33   | The Bank of UFJ                             | 103  | 145  | Japan Brake Industrial Co., Ltd.       |
| -    | 34   | The Nomura Trust and Banking Co., Ltd.      | 104  | 146  | HARADA INDUSTRY CO.,LTD.               |
| -    | 35   | NIPPONKOA INSURANCE CO.,LTD.                | 105  | 147  | Pioneer Corporation                    |
| -    | 36   | The Dai-ichi Mutual Life Insurance Company  | 106  | 148  | PIOLAX, Inc.                           |
| -    | 37   | The Bank of Tokyo-Mitsubishi, Ltd.          | 107  | 149  | Hitachi Metals, Ltd.                   |
| -    | 38   | Meiji Yasuda Life Insurance Company         | 108  | 150  | Hitachi, Ltd.                          |
| -    | 39   | Mizuho Corporate Bank., Ltd.                | 109  | 151  | Hitachi Cable, Ltd.                    |
| -    | 40   | The Master Trust Bank of Japan, Ltd.        | 110  | 152  | Fujikura Ltd.                          |
| -    | 41   | Japan Trustee Services Bank, Ltd.           | 111  | 153  | Bridgestone Corporation                |
| -    | 42   | SUMITOMO MITSUI BANKING CORP                | 112  | 154  | THE FURUKAWA ELECTRIC CO.,LTD.         |
| 1    | 43   | Mazda Motor Corporation                     | 113  | 155  | PRESS KOGYO Co.,LTD.                   |
| 2    | 44   | ASTEER co., Ltd.                            | 114  | 156  | Benteler Automotive K.K.               |
| 3    | 45   | Ishizaki Honten Company, Limited            | 115  | 157  | Bosch Corporation                      |
| 4    | 46   | UCHIYAMA MANUFACTURING CORP.                | 116  | 158  | Marui Industrial Co., Ltd.             |
| 5    | 47   | UBE INDUSTRIES, LTD.                        | 117  | 159  | Mikuni Corporation                     |
| 6    | 48   | OHMORI TECHNOS CO.,LTD                      | 118  | 160  | mitsui MINING & SMELTING CO.,LTD.      |
| 7    | 49   | OGINO INDUSTRY CO.,LTD                      | 119  | 161  | Mitsuba Corporation                    |
| 8    | 50   | ONDO CORPORATION                            | 120  | 162  | Mitsubishi Electric Corporation        |
| 9    | 51   | Kautex Textron                              | 121  | 163  | Minebea Co.,Ltd.                       |
| 10   | 52   | KAINAN IRON WORKS CO.,LTD                   | 122  | 164  | Meiwa IndustryCo.,Ltd.                 |
| 11   | 53   | KATAYAMA KOGYO CO., LTD.                    | 123  | 165  | YAZAKI CORPORATION.                    |
| 12   | 54   | KAWAKAMI IRONWORKS.CO.LTD                   | 124  | 166  | U-SHIN LTD.                            |
| 13   | 55   | KAWADA Corporation                          | 125  | 167  | Unipres Corporation                    |
| 14   | 56   | KANDA CO.,LTD.                              | 126  | 168  | THE YOKOHAMA RUBBER CO.,LTD.           |
| 15   | 57   | KEYLEX corporation.                         | 127  | 169  | YOROZU Corporation                     |
| 16   | 58   | Kitagawa Iron Works Co., Ltd.               | 128  | 170  | RIKEN CORPORATION                      |
| 17   | 59   | KIYO INC                                    | 129  | 171  | AISAN INDUSTRY CO LTD Hiroshima Sales  |
| 18   | 60   | KUBOTA IRON WORKS CO.,LTD                   | 130  | 172  | Aisin AI CO.,LTD.                      |
| 19   | 61   | KURASHIKI KAKO CO., LTD.                    | 131  | 173  | Aisin AW CO.,LTD.                      |
| 20   | 62   | KUROISHI IRONWORKS.CO.LTD                   | 132  | 174  | AICHI STEEL CORP. Hiroshima Sales      |

|    |     |  |     |     |  |
|----|-----|--|-----|-----|--|
| 21 | 63  | Kostal Japan Co.,Ltd.                    | 133 | 175 | Ashimori Industry,Co., Ltd.              |
| 22 | 64  | Kolbenschmidt K.K.                       | 134 | 176 | ADVICS CO.,Ltd.                          |
| 23 | 65  | SANKEI INDUSTRY CO., LTD.                | 135 | 177 | INOAC CORPORATION                        |
| 24 | 66  | SANWA INDUSTRY CO.,LTD.                  | 136 | 178 | Imasen Electric Industrial Co., Ltd.     |
| 25 | 67  | Sigma.co.ltd.                            | 137 | 179 | EXEDY Corporation                        |
| 26 | 68  | GP Daikyo Corporation.                   | 138 | 180 | NTN Corp.                                |
| 27 | 69  | SUGHARA CO.,LTD                          | 139 | 181 | Osaka Rashi Mfg. Co., Ltd.               |
| 28 | 70  | Sumitomo Electric Sintered Alloy Ltd.    | 140 | 182 | OKUMURA FORGE CO.,LTD.                   |
| 29 | 71  | SUMINO KOGYO CO., LTD                    | 141 | 183 | owari precise products co.,ltd.          |
| 30 | 72  | Dairiki IronWorks Co., Ltd.              | 142 | 184 | Kanemitsu Corporation                    |
| 31 | 73  | CHUO INDUSTRIES, LTD.                    | 143 | 185 | Kawashima Selkon Textile Co.,Ltd.        |
| 32 | 74  | CHUO SPRING INDUSTRY                     | 144 | 186 | KYOWA INDUSTRIAL CO.,LTD.                |
| 33 | 75  | DELTA Inc.                               | 145 | 187 | GATES UNITTA ASIA COMPANY.               |
| 34 | 76  | Toyo Advanced Technologies Co.,Ltd.      | 146 | 188 | JTEKT Corporation.                       |
| 35 | 77  | TOYO SEAT Co.,Ltd.                       | 147 | 189 | KOKUSAN PARTS INDUSTRY CO.,LTD.          |
| 36 | 78  | NAGATO CORPORATION                       | 148 | 190 | Samtech Co.,Ltd.                         |
| 37 | 79  | NANJO SOBI KOGYO CO., LTD.               | 149 | 191 | GS Yuasa Corporation                     |
| 38 | 80  | NIITECH CO., LTD.                        | 150 | 192 | ShinMaywa Industries, Ltd.               |
| 39 | 81  | Nishikawa Kasei Co.,Ltd.                 | 151 | 193 | STARLITE Co.,Ltd.                        |
| 40 | 82  | Nishikawa Rubber Co., Ltd.               | 152 | 194 | Sumitomo Metal Industries, Ltd.          |
| 41 | 83  | Japan Climate Systems Corporation        | 153 | 195 | Sumitomo Electric Industries, Ltd.       |
| 42 | 84  | HAMADA CORPORATION.                      | 154 | 196 | SUMINOE Co.,Ltd.                         |
| 43 | 85  | Visteon Asia Pasific                     | 155 | 197 | SEIREN Co.,Ltd                           |
| 44 | 86  | HIRUTA KOGYO CO., LTD                    | 156 | 198 | Daido Steel Co.,Ltd.                     |
| 45 | 87  | HIROSHIMA ALUMINUM CO., LTD              | 157 | 199 | DAIDO METAL Corporation.                 |
| 46 | 88  | HIROSHIMA SEIKEN KOGYO CO.,LTD           | 158 | 200 | Taihei Koki MGF Co.,Ltd.                 |
| 47 | 89  | HIROSHIMA SEIMITSUKOGYO CORP             | 159 | 201 | Goodyear Japan Ltd.                      |
| 48 | 90  | HIROTANI Co.,Ltd.                        | 160 | 202 | Chuo Spring Co.,Ltd.                     |
| 49 | 91  | HIROTEC.Co.,Ltd.                         | 161 | 203 | TSUBAKIMOTO CHAIN CO.                    |
| 50 | 92  | FUTABA KOGYO CO., LTD.                   | 162 | 204 | TRW Automotive Japan.                    |
| 51 | 93  | Webasto Japan Co. Ltd.                   | 163 | 205 | DENSO CORPORATION                        |
| 52 | 94  | MICROTECHNO CORPORATION                  | 164 | 206 | TOKAI Corp.                              |
| 53 | 95  | Mazda Engineering & Technology Co.,Ltd.  | 165 | 207 | Tokai Rubber Industries, Ltd.            |
| 54 | 96  | MAPS CO.,LTD                             | 166 | 208 | TOKAI RIKI CO.,LTD.                      |
| 55 | 97  | MALOX Co.,Ltd.                           | 167 | 209 | TOYO TIRE & RUBBER CO.,LTD.              |
| 56 | 98  | Matsumoto Heavy Industry Co.,Ltd.        | 168 | 210 | TOYOTA MACHINE WORKS.LTD.                |
| 57 | 99  | Minoru Kasei Co.,Ltd.                    | 169 | 211 | TOYOTA GOSEI CO.,LTD.                    |
| 58 | 100 | Molten Corporation.                      | 170 | 212 | Nikkei Kakoh Co., Ltd.                   |
| 59 | 101 | Yumex Corporation,                       | 171 | 213 | Nihon Cable System Co.,Ltd.              |
| 60 | 102 | YOSHIWA INDUSTRY CO.,LTD                 | 172 | 214 | JAPAN DROP FORGE CO.,LTD.                |
| 61 | 103 | LEAR CORPORATION JAPAN                   | 173 | 215 | NGK SPARK PLUG CO.,LTD.                  |
| 62 | 104 | Ryobi Limited.                           | 174 | 216 | Hanshin Electric Co.,Ltd.                |
| 63 | 105 | Ring Techs Hiroshima Co.,Ltd.            | 175 | 217 | BANDO CHEMICAL INDUSTRIES, LTD.          |
| 64 | 106 | YNS INC.                                 | 176 | 218 | HIKARI SEIKO CO.,LTD.                    |
| 65 | 107 | Y-TEC CORPORATION                        | 177 | 219 | Matsushita Electric Industrial Co., Ltd. |
| 66 | 108 | Akebono Brake Industry Co., Ltd.         | 178 | 220 | MARUYASU INDUSTRIES CO.,LTD.             |
| 67 | 109 | ASMO CO.,LTD.                            | 179 | 221 | MITSUBOSHI BELTING LTD.                  |
| 68 | 110 | Ishikawajima-Harima Heavy Industries Co. | 180 | 222 | MIYAGAWA KASEI INDUSTRY CO.,LTD.         |
| 69 | 111 | ICHIKOH INDUSTRIES,LTD.                  | 181 | 223 | METALART CORPORATION                     |
| 70 | 112 | Usui Kokusai Sangyo Kaisha, Ltd.         |     |     |  |

Note: No.\* is the sequential number in the transaction network, and No.# is the sequential number in the cross-shareholdings network.

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