

Social Capital and Regional Specialization in Japan

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Abstract

This article examines the results of two questionnaire surveys on the locational decisions of new manufacturing plants as well as regional social capital in order to investigate the association between social capital and the regional specialization of industries. The findings indicate that, in regard to industrial location decisions, the impact of social capital is uneven across all industries and limited to a particular group of industries. Such impact of social capital is only positively associated with the specialization of industries whose locational decisions are more dependent upon social ties. In addition, a series of correlational analyses reveals that the regional share of new locations for these industries is positively associated with many institutional indices.

1. Introduction

The concept of social capital has recently attracted an increasing number of researchers in the field of regional science (Glaeser et al. 2002; McCann et al., 2010; Roskrugue et al., 2012). Beginning in the latter half of the 1990s, the causal nexus between social capital and economic growth has been investigated by several authors such as La Porta et al. (1997), Knack and Keefer (1997), and Zak and Knack (2001). Since the theory has become commonly accepted by scholars, the role played by social capital in regional (Westlund, 2006; Glaeser & Redlick, 2009) and national (Castiglione et al., 2008; Svendsen and Svendsen, 2009) economic growth is now widely applied in economic literature (Roskrugue et al., 2012).

In addition, the application of social capital has recently become much more common in the field of economic geography as well (Cooke et al., 2005; Iyer et al., 2005; Murphy, 2006; Holt, 2008; Huber, 2009; Rutten et al., 2010). According to Malecki (2011), social capital is the key to promoting regional, innovative learning and entrepreneurial activities, which suits the concept in the current issues of economic geography. In the same year, Farole, Rodrigues-Pose, and Storper (2011) reviewed industry-cluster literature and discussed how

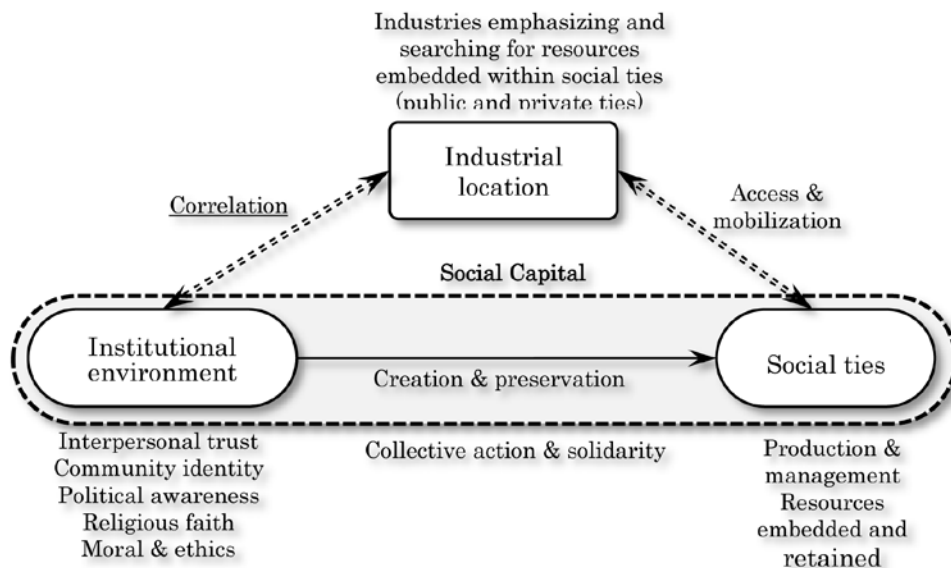


Figure 1: Causal Mechanism of How Social Capital Promotes Industrial Location

concepts of social capital, such as trust, social ties, and community identity, are theoretically associated with the institutional approach in economic geography¹⁾. With regard to these studies, 2010 might be viewed as the initial year when economic geographers began adopting a serious stance on the study of social capital.

Among wide-ranging applications of the concept of social capital, a number of recent studies have focused on the role of social capital and the locational decision-making process of firms in particular (Dahl & Sorenson, 2007; Glaeser & Kerr, 2009; Giannetti & Simonov, 2009; Lambooy, 2010; Audretsch et al., 2011). Among the studies that challenged the influence of social capital on locational choice, Feldman et al. (2005) theoretically specified the roles of horizontal networks in local firms and vertical ties between horizontally networked firms and the government. Dahl and Sorenson (2007) attributed the determinant of why entrepreneurs and managers prefer locations near their home base to locally accumulated social capital. In addition, Glaeser and Kerr (2009) highlighted the role of social capital in new entry rates of manufacturers and discovered that US manufacturing start-ups are generally attracted to small local suppliers and abundant workers in relevant occupations. Giannetti and Simonov (2009) and Malecki (2011) argued that social interactions are the key to facilitating local innovative and entrepreneurial activity. Additionally, a series of empirical studies by Klepper (2009) implies that many firms are launched in locations where the founders currently reside since they are socially embedded in their local communities and networks. In regard to the locational behavior of firms, many recent studies have highlighted the role of social capital, particularly in regard to the formation of industrial clusters and specialized industries among networked firms (Rutten et al., 2005; Cooke et al., 2005; Feldman et al., 2005; Stam, 2007; Staber, 2007; Huber, 2009; Tomlinson, 2011).

The literatures reviewed above more or less share the same causal mechanism in terms of how the local quality of social capital consequently promotes industrial location, which is summarized in Figure. This figure represents the dual nature of social capital that is specifically associated with industrial locations, whose idea consists of the following two aspects (Lin 2008)²⁾. First, social capital consists of institutional environments such as trust, shared norms, beliefs, and values supported by local institutional environments contributing toward the creation and preservation of social ties wherein various production and management resources are embedded and retained. In this specific study, the institutional environment is represented by interpersonal trust, community identity, political awareness,

religious faith and moral & ethics, which is discussed later.

Second, since the firms are myopic (Maskell and Malmberg, 2007), their locational decisions are critically dependent upon the resources embedded and retained in local social ties, which enables firms to access and mobilize³⁾. Such resources include production knowledge, technologies, supplies, demands, and public support embedded in trust-based and long-lasting social ties that are beneficial for sustaining localized competitiveness (Portes and Sensenbrenner, 1993; Cooke and Morgan, 1998; Narayan, 2002; Inkpen and Tsang, 2005; Joshi 2006; Tura and Harmaakorpi, 2005; Lundvall, 2006; Moody and Paxton, 2009; Staber, 2011). Combining the two factors, scholars argue that better institutional environments reinforce social ties, and hence local firms become more accessible to resources embedded and retained within such ties. As a result, these environments provide more effective locational decision to local firms through locally accessed and mobilized social ties.

In addition to that, according to the causal mechanism, there must be industrial variety in the importance of social ties formed in such specific institutional environments. Clearly, there is industrial variety in locational priorities and not all industries primarily rely upon social ties. Although some industries are certainly attracted to resources embedded and retained in social ties, other locational factors such as multiple location costs and proximity to related agencies are more important for other industries. In such cases, the role played by social capital can be diminished. Based on the above points, it can be assumed that the positive impact of social capital is uneven across all industries and varies from industry to industry.

Based on the discussion so far, this article explores this particular causal mechanism by examining survey data and the essence of the idea can be translated into the following statement: social capital affects industrial location of some industries through social ties, if the positive impact of institutional environment is not even across all industries but limited to a particular group of industries, and only if the particular group of industries emphasizes social ties in the location choice.

Here, the “if-and-only-if” condition is parallel to the necessary and sufficient conditions for supporting the potential effectiveness of the causal mechanism, which can be alternatively translated into the following two hypotheses:

Hypothesis I: *In regard to locational decisions, the positive impact of institutional*

environments is uneven across all industries and limited to a particular group of industries.

Hypothesis II: *Among particular industry groups, the impact of institutional environments is only positive for industries whose locational decisions are more dependent upon social ties.*

The first hypothesis encompasses the general idea that influence of social capital is not necessarily positive for all industries since each industry has different needs for social ties and resources within their locational decision-making process. In this case, there must be industrial variety in terms of the impact of social capital. Furthermore, a positive impact must be diminished when multiple industries are aggregated since such aggregation dilutes the industry-specific dependency on social ties. The second hypothesis identifies the specific role of social capital where institutional aspects of social capital only contribute toward the locational choices of industries searching for resources within social ties. This is to ensure that the contributions of social capital are limited to the locational choice of appropriate industries.

These two hypotheses, based on the necessary and sufficient conditions, can be linked to the concept of “double embeddedness” (Baker & Faulkner, 2008)⁴⁾. As shown in Table 1, the analytical framework consists of two qualitative axes where the horizontal axis discerns the variety of regional qualities for institutional aspects of social capital, which is determined by the regional institutional indices in the analytical section of this article. The first hypothesis, associated with this axis, examines whether the quality of institutional factors is positively associated with the overall frequency of new industrial location. In order to show

Table 1: Analytical framework of “double embeddedness”

		Institutional Environment (trust, shared norms, and values)	
		<i>Better</i>	<i>Worse</i>
Locational Determinants	<i>Social Ties</i>	Type I	Type III
		Better institutional environments improve new locations based on social ties.	Better institutional environments reduce new locations based on social ties.
	<i>Other</i>	Type II	Type IV
		Better institutional environments improve new locations based on other determinants.	Better institutional environments reduce new locations based on other determinants.

that the role played by social capital varies across industries, some industries are classified under Types I and II while other industries are classified into Types III and IV.

Furthermore, industrial dependency on social ties is represented by the vertical axis, which distinguishes the determinants of industries whose locational decisions are either based on social ties or other determinants such as economic costs and proximity to related agencies. The second hypothesis is associated with this axis. After the first horizontal analysis classified some industries to either Types I or II due to the positive influence of local institutional environment, this vertical analysis investigates whether the locations of these industries are determined primarily by social ties or other determinants. If locations are determined by social ties, then these industries are classified as Type I since their locational behavior is determined by social ties that are more accessible and mobilizable due to the better institutional environment. Therefore, this study concludes that institutional environments reinforce social ties and simultaneously cause new industrial locations of Type I industries based on such ties.

In order to examine the first hypothesis, 20 manufacturing industries are initially classified into groups based on their locational determinants. In addition, we investigate the influence of social capital across these industry groups. In regard to the second hypothesis, we search for the most significant impact of social capital on industry groups whose locational determinants are associated with social ties.

2. Methodology and Data

This empirical section examines the correlation between institutional indices and the regional share of new plant locations. The institutional indices, which measure the regional characteristics of local institutional environment and the improvement of institutional quality, is expected to strengthen social ties and subsequently lead local firms to new industrial locations through such ties.

In order to examine the two hypotheses, this study first disaggregates the industries based on the results of an industry-specific, locational survey where industries are grouped by a cluster analysis. These survey results help to characterize the locational determinants of individual industries and identify a group of industries whose locations are more oriented toward social ties. Every industry group that is disaggregated by locational priority is examined. When significant correlations are found not for all groups of industries but only

for a particular group, we consider that the first hypothesis is valid and there is variety in the influence of social capital across industries.

Moreover, in regard to the second hypothesis, we discuss the qualitative aspects of the industry group. Among particular industry groups, if institutional quality is only positively and significantly associated with the regional share of a particular industry group, the study concludes that the second hypothesis is affirmative and the benefits of local institutional environment is only significant for industries whose locational determinants are social ties.

The analytical portion of this study performs a series of correlational analyses. The explanatory variables include several intuitional indicators, which consist of both orthodox and unique survey statistics. The dependent variable is the regional share of new plants in each industry group. In this case, we focus on the regional share of new plants instead of the absolute number since the absolute number is significantly affected by the size of the local economy, which is almost proportional to the local population for all industry groups. In order to isolate the unique impact of social capital from the overall impact of economic size, the relative share is a more useful variable compared to the absolute number.

Also, correlational analysis is by no means one of the most sophisticated methods in current advanced econometric approaches. However, this specific study applies such analysis due to the following two reasons. First, correlational analysis is more suitable for this type of data since the objective of the study is a comparison of two collections of real numbers. While other econometric approaches are possible for discrete data, it is not befitting for the particular data in this study. Second, there are no preliminary theoretical modes that define how institutional factors shape social tie-based (public and private) locations and no econometric modeling is justifiable unless the working mechanism among independent variables is appropriately specified. This specific study is particularly interested in the question of what institutional factors contribute the most toward social tie-based locations. Among the many factors that have been classified into five overall categories, the analytical portion of this study performs one-by-one examinations of the specific factors.

This study utilizes two overall sets of survey data. One is the locational survey of Japan's manufacturing sector, and the other is an institutional survey. The remainder of this section describes the details of these two surveys beginning with a description of the former survey.

2.1 Locational Survey

The locational survey data used in this study are published annually by the Japan

Industrial Location Centre (JILC). In close affiliation with the Ministry of the Economy, Trade and Industry (METI), JILC has promoted the strengthening of Japan's industrial structure. The objective of the questionnaire survey is to investigate the locational choice determinants of new plants in Japan. The results are used for the reorganization of land development and the improvement of locational efficiency. The type of participants (the respondents) and the timing of the survey are described below.

- Participating industries: two-digit SIC manufacturing industries.
- The range of participants: all plant managers (including research institutional environment) that bought or rented more than 1,000 m² of land from 1997 to 2004.
- Timing of the questionnaire: when the contract is made between the land owner and the buyer (debtor).

New plants include those of existing firms and new start-up firms⁵⁾. Plants whose size is smaller than 1,000 m² are excluded from the sample due to the regulation of the survey. If we express the size of 1,000 m² by a square, the length of one side becomes approximately 31.62 m. Therefore, the samples of this survey only include large- and medium-sized plants and

Table 2: summary of the locational survey

Location reason	Primary determinant		Secondary determinant	
	freq.	%	freq.	%
Total	5495	100.0%	7581	100.0%
Access to airport	23	0.4%	106	1.4%
Access to harbor	74	1.3%	94	1.2%
Access to highway	507	9.2%	999	13.2%
Access to railroad	6	0.1%	71	0.9%
Business and logistic service	178	3.2%	472	6.2%
Availability of land	2038	37.1%	1622	21.4%
Availability of industrial zone	696	12.7%	1099	14.5%
Environment and neighborhood	372	6.8%	1024	13.5%
Commuting convenience	388	7.1%	903	11.9%
Support from local government	549	10.0%	682	9.0%
Manager's personal ties	225	4.1%	225	3.0%
Co-location with other firms	66	1.2%	89	1.2%
Others	373	6.8%	195	2.6%

unfortunately small plants are excluded from the sample by the agency⁶⁾.

Table 2 exhibits a summary of the result of the locational survey and contains the actual list of the location reasons. An astute reader may wonder why some of the most presumably important determinants, such as proximity to markets, raw materials, headquarters and affiliated firms, are not included in the list. The reasons are as follows. The first stage of the questions was intended to identify reasons related to the choice of the locational region on a country-wide scope, where proximity to market and raw materials is important. However, social capital is found to have more of an effect on the decision of locational points within a given home region. Therefore, this study focuses on the second stage of the questions, whose determinants are much more narrowly specified for the locational determinants when the locational region is broadly specified.

Additionally, it should be noted that the determinants in the list are by no means arbitrarily chosen by the JILC. All respondents are allowed to state other important locational determinants if they are not included in the list. The JILC has consistently updated the determinant list by ensuring that no important locational factor is left out during each new survey period. Therefore, it is fair to say that the list includes a reasonable selection of possible determinants.

2.2 Institutional Survey

This section describes the details of the institutional survey⁷⁾. The result is used to characterize the local institutional aspect of social capital in individual regions. The dataset is from *Zenkoku Kenmin Ishiki Chousa 1997* (National Survey on Prefectural Residents in 1997), which was conducted by the *Nihon Housou Kyokai* (Japan Broadcasting Association) Culture Research Institute. The survey was conducted from 28 June to 7 July in 1996. It consisted of 60 questions regarding social and political awareness, interpersonal relationships, religion and ethics and opinions to the mass media, based on the interview method. The subject of the survey is 42,300 residents in Japan with 900 residents per prefecture who are above 16 years of age. Since the location survey was conducted from 1997 to 2004, this institutional survey corresponds to the first year of the location survey and it is useful to characterize the initial institutional environment where location decision is made. Among the 60 available questions some questions are deliberately selected as being particularly relevant to the improvement of social ties, and they are summarized into five categories as arranged in Table 3⁸⁾.

Table 3: The summary of National Survey on Prefectural Residents in 1997 in five institutional categories; the percentages are the national averages of the response

<i>Trust and Relationship</i>	Yes (Former)	No (latter)
Do you want to follow the example of your parents?	51.4%	28.7%
Do you want to spend quality time with your family members?	76.8%	10.6%
Do you think that it is natural for all people to get married?	52.1%	34.0%
Which of the following two types of interpersonal relationships do you prefer? Being able to Mutually help and converse about anything or being remain on the superficial surface and able to avoid getting involved	60.7%	29.3%
Do you frequently interact with your family members?	56.9%	31.8%
Can you trust your family members?	67.0%	13.9%
Do you frequently interact with your neighbours?	55.7%	29.0%
Can you trust your neighbours?	47.4%	19.0%
Do you often interact with your colleagues and business associates outside the workplace and business environment?	38.4%	21.0%
Can you trust your colleagues and business associates?	42.4%	7.9%

<i>Community identity</i>	Yes (Former)	No (latter)
Do you recognize and identify yourself as a resident of your prefecture?	71.0%	21.2%
Do you respect local norms and conventions?	57.3%	19.6%
Do you think that the residents of your prefecture are different from those of other prefectures?	46.9%	29.9%
Are you willing to participate in local festivals and events of your home town?	50.5%	32.3%
Do you like the characteristics of people of your home town?	65.2%	10.2%
Do you like the dialect of your home town?	62.3%	18.2%
Do the local people in your home town sometimes sideline strangers?	39.1%	48.5%
Are you shy when meeting strangers?	41.6%	50.6%
Do you actively introduce new ideas in your life and job?	64.1%	21.1%

<i>Political awareness</i>	Yes (Former)	No (latter)
Are you satisfied with the performance of your local politicians?	29.2%	40.8%
Do you feel that you are powerful enough to change local politics?	10.0%	74.1%
In which politics are you most interested: country or municipality?	40.2%	30.4%

<i>Religious faith</i>	Yes (Former)	No (latter)
Do you feel that you are mentally connected with your ancestors?	59.1%	28.1%
Do you feel that praying to God or Buddha for a wish sometimes makes the wish come true?	55.8%	32.2%
Do you want to worship or believe in a deity such as God or Buddha?	53.0%	34.5%
Do you agree that there is no afterworld?	36.0%	34.8%

<i>Moral and ethics</i>	Yes (Former)	No (latter)
Do you want to participate in volunteer activities for the disabled and elderly?	54.3%	25.2%
Do you agree that individual rights can be restricted for public benefits?	41.3%	37.6%
Do you feel that working is burdensome?	22.5%	69.4%
Are you willing to continue working even if you are wealthy?	74.7%	17.2%
Do you agree that lying is crime or sin?	69.5%	14.1%
Do you agree that having a sexual relationship with others than one's spouse is unforgivable?	74.1%	11.3%
Do you agree that gambling is unforgivable?	47.6%	30.7%

The first and most important category is trust and relationship category. Interpersonal trust is the heart of social capital (Putnam, 2000; Fukuyama, 1995). Those questions essentially inquire about the local conditions of the inter-personal relationships among family members, neighbours and colleagues and focuses on the frequency of the interactions and the degree of trust with the members. In particular, the role of social capital in family businesses and firms has recently attracted many management studies (Arregle et al. 2007; Pearson 2008 for a review). Since trust and interactions are the foundational property of social capital, the degree of locational choice through social ties improved by interpersonal trust is the primary concern of the analysis.

The second category is community identity. Community is the basis of the creation of social capital (Coleman 1988; Putnam 1993). Alexander (2006) argued that feelings for others are the basis of solidarity. Hayami (2009) considered the community takes the central role in producing social capital. In addition to the trust and relationship category above, this community identity examines the influence of local socialization on through social ties. While trust and relationships are not necessarily a spatial concept, community identity shared among municipality members adds locality to interpersonal relationships. The questions inquire about whether local people are willing to participate in local events. This is relevant to the level of local interactions. Moreover, it concerns whether communities are close or open to non-community members. This is associated with the consciousness of local camaraderie, which is concerned with insider-outsider issues (Bowles and Gintis 2002; Staber and Sautter; 2010).

Third category, the political awareness of local people is considered to buttress social ties particularly to public agencies, particularly support from the local government. Tocqueville (1988) recognized that the strength of democracy is dependent upon social networks and culture, such as shared values, norms and meanings. This thought was rediscovered by Putnam (1993), who found a correlation between the measures of civic engagement and government quality across regions in Italy. The result of this political awareness category becomes a useful reference for how correlations between locations due to local government support and other trust-based social capital are supported by the political awareness of the local people. Those questions measure the level of local political interest and, the higher is the interest, the more we expect the policies to be effective and reflective on the public opinions, which improves the quality of the policy supports for new plant formation. In addition, since plant construction is a long-term commitment for firms, trust in the local

government is also essential in making the correct choice. The trustworthiness of the local government tends to be improved upon by the strong political awareness of the local people.

Fourth, in the fourth and fifth categories, questions regarding religious faith of local people are explored. The religious faith is deeply concerned with the origin of social capital studies (Weber 1958; Colman 1988; 1990) and one of the most studied aspects of social capital (Manza and Brooks 1997; Layman 1997). Iannaccone (1988) and Coleman (1990), for instance, interpreted religious norms as the result of group-level optimization and Guiso et al., (2003; 2006) found that religious faith improves the trustworthiness of people.

Finally, the examination of the morals and ethics is inspired by the idea of 'social capital as good culture', which is a set of beliefs and social values that facilitates cooperation among the members of a community (Guiso et al. 2003; 2006). Moreover, the category contains moral and ethical questions, which is the basis of 'generalized trust' (Putulny and Svendsen 2007). The first two questions are particularly concerned with local altruistic culture (Putnam 1993). The investigation is important because the organization is embedded in a moral system as much as it is in the networks of social relations (Uslaner 2002; Krippner et al. 2004; Baker and Forbes 2006).

3. Result

This results section begins by characterizing groups of the 20 manufacturing industries in terms of locational determinants. It later examines the correlations of the regional share of new locations of each industry group with institutional indices. Hence this result section consists of two subsections. The first subsection introduces the results of the cluster analysis, whereby the industries are classified into groups in terms of the choice frequency rate of various locational determinants. The second subsection examines the correlations between the regional share of new locations of each industry group and institutional indices.

3.1 Industrial variety in locational determinants

The first subsection classifies 20 manufacturing industries into a few industrial groups and identifies a group whose locational determinants are most oriented towards social ties⁹⁾. To accomplish the classification process, we first perform a hierarchical cluster analysis that eventually identifies three large industry groups. Second, while characterizing the differences of their average profiles of individual group in radar plots, we discuss the variety

in their average profiles and identify a group of industries whose locations are most affected by social ties.

To begin with, Figure 2 exhibits a cluster dendrogram that illustrates the overall similarity and dissimilarity of the choice frequency of locational determinants across industries. In processing the cluster analysis, the choice frequency share is used because the number of the respondents varies across industries and the result is affected by the number of respondents. In drawing the cluster dendrogram, the method and the distance applied is that of the Ward and Euclidean, respectively¹⁰⁾.

As identified in Figure 2, there are two large groups: Group 1 and Group 2. Group 2 can be disaggregated into two lower groups: 2A and 2B. Therefore, industries are classified into three groups, according to the location of the industries within a group that have a similar profile of locational determinants, and it is possible to weakly characterize these industry groups. Group 1 represents supplier industries, since the group includes iron, pulp, rubber, plastic, chemical, non-ferrous metal and fabricated metal industries. Even though the group contains transportation equipment and general machinery industries, their products are used as production capital and their industrial features can partially be deemed as supplier industries. In addition, industries in Group 2 are more likely to produce finished products, rather than intermediate inputs. This is, particularly, a fact for electrical machinery, precision

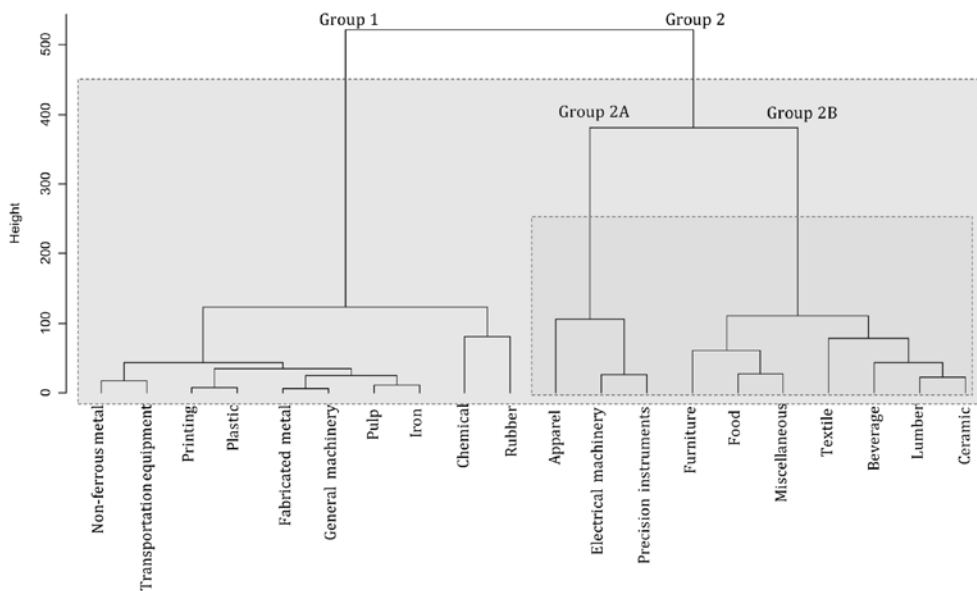


Figure 2: Cluster dendrogram of industrial locational preference profiles

instruments, apparel, furniture, food, beverages and ceramic industries. Moreover, those downstream industries in Group 2 are disaggregated into two lower subgroups and it is fairly true that those in Group 2B are light-manufacturing industries, while electrical machinery and precision instrument industries in Group 2A are high-tech manufacturing industries.

Figure 3 illustrates the average feature of choice frequency of each locational determinant for the individual groups, computed as the group average over the total average. Based on the figure, the average locational preference of each group can be interpreted as follows. The left radar chart distinguishes Group 1 and 2 and we found that their determinant profiles are inversely related with one another. Group 1 prefers locating inside of the industrial zone and having more proximity to highways. Those determinants can be summarized as an infrastructure support. In contrast, the manager’s personal ties and support from local governments are important locational determinants for Group 2. Those determinants can be interpreted as relationship based to the extent that they highlight social ties represented by the two tie-based determinants. In addition, the group pays more attention to the surrounding environment and the neighbourhood. For these group characterizations, we found a clear contrast between the average location features of the groups.

A variety of the frequencies exists even within Group 2, as portrayed in the right chart. Group 2A emphasizes commuting convenience, personal ties and local policy support, and both private and public ties are more important for Group 2A, while Group 2B is characterized by fewer restrictions from the environment and the neighbourhood, other transportation services and the shared location with the other firms. Therefore, Group 2A emphasizes social ties more than Group 2B.

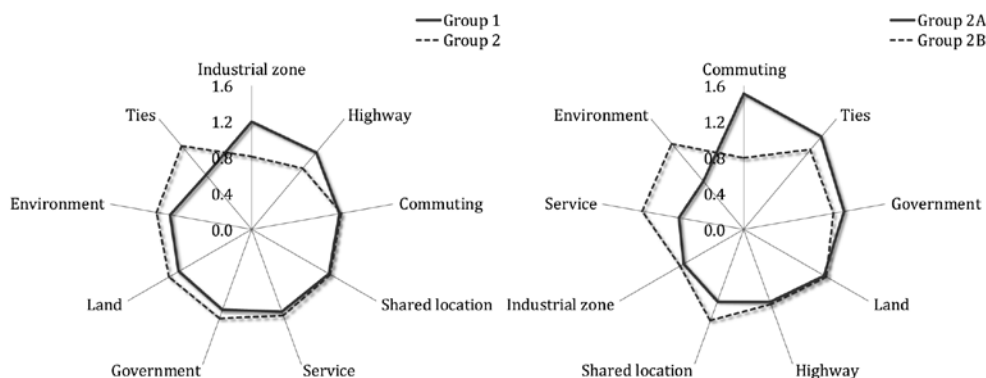


Figure 3: Radar charts; the average locational determinants of each industrial group

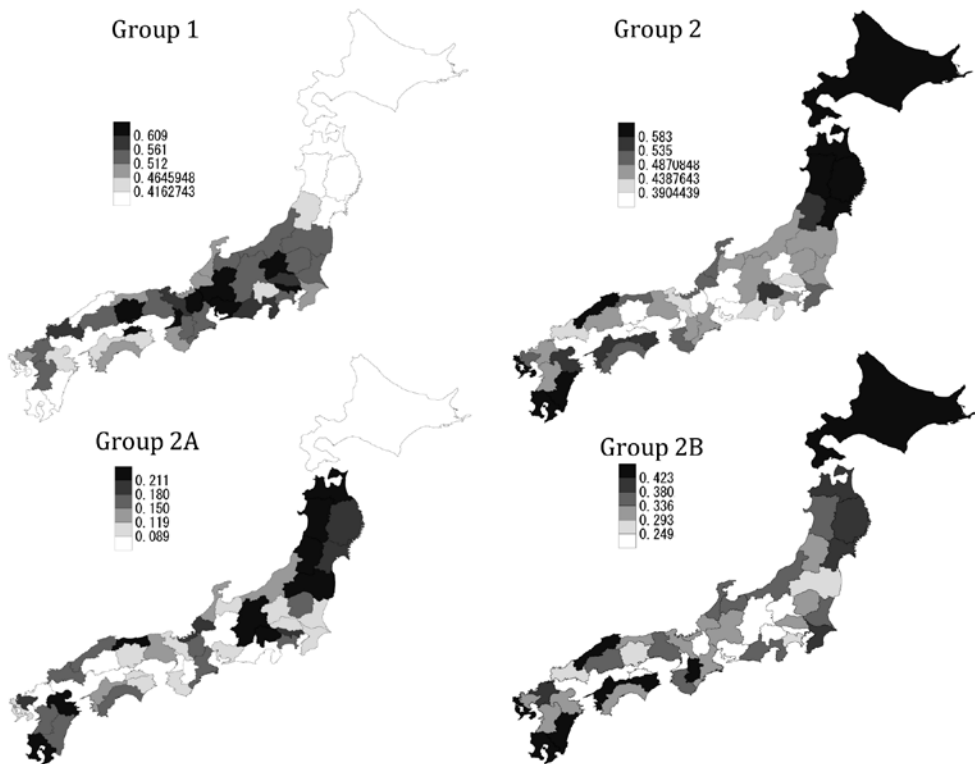


Figure 4: Quartile maps; the regional share of new plants in the four classified industrial groups

In summary, as organized in Table 4, industries are categorized into two large groups. The locational determinant of Group 1 is more oriented towards infrastructure advantages and the locational determinant of Group 2 is more influenced by social ties, particularly bridging to local government and bonding among managers. Regarding the industry grouping, it is important to note that two high-tech industries belong to Group 2A, electrical machinery and precision instrument industries. This partially underscores the idea that the social network becomes more important for high-tech industries. In addition, industries in Group 2B are characterized as light-manufacturing industries, which are, according to the classification, less dependent on infrastructure supports.

Thus, this subsection reasonably succeeded in identifying an industry group, Group 2A, whose locational choice is more influenced by social ties. The concern of this study is whether or not the regional share of Group 2A improves as local institutional environment enhances. The latter half of this empirical section examines the concern.

Table 4: Industrial characterization of the cluster groups

<i>Group</i>	<i>Number</i>	<i>Location reason</i>	<i>Location reasons</i>	<i>Industry</i>
Group1	10	<i>Infrastructure support</i>	<ul style="list-style-type: none"> ▶ Highway access ▶ Industrial zone 	Pulp Printing Chemical Plastic Rubber Iron Non-ferrous metal Fabricated metal General machinery Transportation equipment
Group2	10	<i>Social Ties & Environment</i>	<ul style="list-style-type: none"> ▶ Support from of government ▶ Personal ties ▶ Land availability ▶ Environment and neighborhood 	
Group2A	3	<i>Social Ties</i>	<ul style="list-style-type: none"> ▶ Commuting ▶ Personal ties ▶ Support of local government 	Apparel Electrical machinery Precision instruments
Group2B	7	<i>Environment</i>	<ul style="list-style-type: none"> ▶ Environment and neighborhood ▶ Logistic service ▶ Shared location with other firms 	Beverage Textile Lumber Furniture Food Ceramic Miscellaneous

3.2 Correlation with institutional statistics

In Table 5, the correlation coefficient is computed for the share of 'Yes' and 'No' responses for each question. Four possible choices are given to respondents: 'Yes', 'No', 'Neither' and 'Not sure'. This analysis considers that the shares of only 'Yes' and 'No' are meaningful to examine because they are strong affirmation and denial, respectively, and examining both is worthwhile because they are not necessarily inversely correlated with one another because of the other two univalent responses. For the examination of statistical significance, a two-tailed test was examined. The results are represented in the p-values. For the case of the p-value less than 0.05, a filled circle is marked before the correlation coefficient to highlight the significance, whereas in case of a p-value less than 0.10, an unfilled circle is marked for the weak significance.

The locational determinant of Group 2A is more oriented towards social ties. Regarding the category of trust and relationships, significant correlations are found for enhanced trust and relationships with family members, neighbours and colleagues for both Group 2 and 2A, while the correlation is the opposite for Group 1. Therefore, it is fair to say that those high-

Table 5: The results of the series of the correlation analyses between regional shares of industry group and the social capital statistics

Category		Geography							
Statistics	Log of population density	Log of manufacturing establishment density	Log of headquarter density in manufacturing	Average number of employees per sample plant	Employment rate of the Primary Industries	Employment rate of the Secondary Industries	Employment rate of the Tertiary Industries	Highway distance per area of land	
Year	2000	2000	2000	1997-2004	2001	2001	2001	2000	
All plants	0.091	0.149	0.061	0.193	-0.199	0.171	-0.018	0.077	
t-value	0.603	1.002	0.406	1.303	1.347	1.154	0.122	0.512	
std. error	0.330	0.239	0.365	0.169	0.160	0.203	0.394	0.347	
Group1	0.616	0.761	0.697	0.371	-0.666	0.423	0.058	0.627	
t-value	5.189	7.771	6.789	2.654	5.928	3.097	0.386	5.334	
std. error	0.000	0.000	0.000	0.014	0.000	0.005	0.368	0.000	
Group2	-0.616	-0.761	-0.697	-0.371	0.666	-0.423	-0.058	-0.627	
t-value	5.189	7.771	6.789	2.654	5.928	3.097	0.386	5.334	
std. error	0.000	0.000	0.000	0.014	0.000	0.005	0.368	0.000	
Group2A	-0.358	-0.298	-0.430	-0.127	0.545	-0.031	-0.359	-0.241	
t-value	2.547	2.073	2.545	0.808	4.312	0.261	2.554	1.650	
std. error	0.018	0.049	0.018	0.275	0.000	0.388	0.018	0.103	
Group2B	-0.434	-0.636	-0.501	-0.344	0.358	-0.449	0.188	-0.527	
t-value	3.194	5.471	4.298	2.430	2.546	3.333	1.267	4.116	
std. error	0.004	0.000	0.000	0.023	0.018	0.002	0.177	0.000	

Category		Social ties						
Statistics	Job turnover	Job separation rate	Share of commuters to other municipalities	Moving-in rate	Divorce rate	Share of nuclear family	House ownership rate	Share of college degree holders
Year	2000	2002	2000	2004	2003	2000	2003	2000
All plants	0.426	0.120	0.184	-0.160	0.160	0.056	-0.224	-0.031
t-value	3.121	0.804	1.241	1.075	1.077	0.370	1.527	0.207
std. error	0.004	0.286	0.183	0.221	0.221	0.372	0.124	0.388
Group1	0.433	0.212	0.568	0.311	-0.032	0.175	-0.256	0.556
t-value	3.185	1.441	4.582	2.174	0.210	1.177	1.758	4.437
std. error	0.004	0.141	0.000	0.040	0.388	0.197	0.086	0.000
Group2	-0.433	-0.212	-0.568	-0.311	0.032	-0.175	0.256	-0.556
t-value	3.185	1.441	4.582	2.174	0.210	1.177	1.758	4.437
std. error	0.004	0.141	0.000	0.040	0.388	0.197	0.086	0.000
Group2A	-0.376	-0.349	-0.389	-0.049	-0.170	-0.455	0.238	-0.358
t-value	2.688	2.472	2.803	0.324	1.147	3.387	1.623	2.543
std. error	0.013	0.021	0.010	0.376	0.204	0.002	0.107	0.018
Group2B	-0.218	0.009	-0.359	-0.312	0.155	0.125	0.118	-0.367
t-value	1.479	0.061	2.549	2.179	1.040	0.835	0.788	2.616
std. error	0.133	0.396	0.018	0.040	0.230	0.278	0.289	0.015

Category		Social participation and trust							
Statistics	Voting rate of the Upper House election	Voting rate of the Lower House election	Number of public hall per million	Number of youth education hall per million	Population share who joined in a volunteer activity for the year	Total number of crimes recorded	Number of property crimes	Number of violation of the Road Traffic Law	
Year	2001	2000	2002	2002	2001	2008	2008	2008	
All plants	-0.269	-0.149	-0.194	-0.013	-0.120	0.242	0.249	-0.091	
t-value	1.850	1.000	1.313	0.089	0.804	1.654	1.706	0.605	
std. error	0.074	0.239	0.167	0.395	0.286	0.102	0.094	0.329	
Group1	-0.300	-0.433	-0.306	-0.275	-0.282	0.636	0.610	0.251	
t-value	2.727	3.190	2.136	1.899	1.946	5.463	5.108	1.719	
std. error	0.012	0.004	0.043	0.067	0.062	0.000	0.000	0.092	
Group2	0.380	0.433	0.306	0.275	0.282	-0.636	-0.610	-0.251	
t-value	2.727	3.190	2.136	1.899	1.946	5.463	5.108	1.719	
std. error	0.012	0.004	0.043	0.067	0.062	0.000	0.000	0.092	
Group2A	0.479	0.466	0.545	0.150	0.405	-0.552	-0.546	-0.081	
t-value	3.615	3.496	4.307	1.009	2.838	4.388	4.328	0.536	
std. error	0.001	0.002	0.000	0.237	0.007	0.000	0.000	0.343	
Group2B	0.087	0.155	-0.042	0.200	0.029	-0.320	-0.295	-0.222	
t-value	0.578	1.038	0.276	1.357	0.190	2.237	2.046	1.513	
std. error	0.335	0.230	0.382	0.158	0.389	0.035	0.051	0.127	

Table 6: The results of the series of the correlation analyses between regional shares of industry group and the social capital statistics

I Trust and Relationship			Number of new plants	Group1	Group2	Goup2A	Group2B
Do you want to follow the example of your parents?	Yes	coefficient p-value	-0.043 0.775	○ -0.265 0.076	○ 0.265 0.076	0.153 0.310	0.187 0.214
	No	coefficient p-value	0.073 0.629	● 0.330 0.025	● -0.330 0.025	● -0.124 0.028	● -0.130 0.355
Do you want to spend quality time with your family members?	Yes	coefficient p-value	● -0.345 0.019	● -0.334 0.023	● 0.334 0.023	● 0.300 0.043	● 0.161 0.284
	No	coefficient p-value	○ 0.248 0.097	○ 0.221 0.141	○ -0.221 0.141	○ -0.249 0.097	○ -0.072 0.636
Do you think that it is natural for all people to get married?	Yes	coefficient p-value	○ -0.268 0.072	● -0.336 0.022	● 0.336 0.022	● 0.369 0.012	● 0.115 0.448
	No	coefficient p-value	● 0.311 0.035	● 0.327 0.026	● -0.327 0.026	● -0.395 0.007	● -0.086 0.568
Which of the following two types of interpersonal relationships do you prefer?	Being able to support each other	coefficient p-value	-0.027 0.856	-0.162 0.283	0.162 0.283	-0.018 0.904	0.193 0.199
	Being remain on the superficial surface	coefficient p-value	0.071 0.641	● 0.295 0.046	● -0.295 0.046	-0.158 0.296	-0.218 0.146
Do you frequently interact with your family members?	Yes	coefficient p-value	-0.054 0.721	● -0.392 0.007	● 0.392 0.007	● 0.432 0.003	● 0.133 0.379
	No	coefficient p-value	0.017 0.910	● 0.385 0.008	● -0.385 0.008	● -0.506 0.000	● -0.073 0.631
Can you trust your family members?	Yes	coefficient p-value	-0.115 0.446	-0.178 0.236	0.178 0.236	0.242 0.105	0.028 0.853
	No	coefficient p-value	0.105 0.487	0.120 0.428	○ -0.120 0.428	● -0.111 0.036	0.085 0.574
Do you frequently interact with your neighbours?	Yes	coefficient p-value	● -0.304 0.040	● -0.338 0.021	● 0.338 0.021	● 0.378 0.010	● 0.111 0.464
	No	coefficient p-value	○ 0.257 0.064	○ 0.268 0.071	○ -0.268 0.071	● -0.389 0.008	-0.025 0.867
Can you trust your neighbours?	Yes	coefficient p-value	○ -0.258 0.055	● -0.383 0.009	● 0.383 0.009	● 0.346 0.018	● 0.182 0.225
	No	coefficient p-value	0.188 0.210	-0.239 0.110	○ -0.239 0.110	○ -0.272 0.067	-0.074 0.624
Do you often interact with your colleagues and business associates outside the workplace and business environment?	Yes	coefficient p-value	0.004 0.978	-0.391 0.789	0.391 0.789	● 0.378 0.010	-0.220 0.142
	No	coefficient p-value	-0.017 0.807	● 0.350 0.017	● -0.350 0.017	● -0.326 0.172	-0.160 0.287
Can you trust your colleagues and business associates?	Yes	coefficient p-value	-0.004 0.977	0.050 0.742	-0.050 0.742	0.172 0.254	-0.176 0.242
	No	coefficient p-value	0.109 0.510	○ -0.267 0.073	○ -0.267 0.073	● -0.292 0.049	-0.092 0.544
II Community identity			Number of new plants	Group1	Group2	Goup2A	Group2B
Do you recognize and identify yourself as a resident of your prefecture?	Yes	coefficient p-value	-0.170 0.259	● -0.478 0.001	● 0.478 0.001	● 0.413 0.004	0.241 0.107
	No	coefficient p-value	0.156 0.300	● 0.516 0.000	● -0.516 0.000	● -0.420 0.004	○ -0.279 0.061
Do you respect local norms and conventions?	Yes	coefficient p-value	-0.053 0.726	● -0.325 0.028	● 0.325 0.028	○ 0.276 0.064	0.167 0.266
	No	coefficient p-value	0.666 0.065	0.163 0.280	-0.163 0.280	-0.124 0.412	-0.094 0.534
Do you think that the residents of your prefecture are different from those of other prefectures?	Yes	coefficient p-value	-0.149 0.325	● -0.334 0.023	● 0.334 0.023	○ 0.277 0.062	0.177 0.240
	No	coefficient p-value	0.223 0.136	● 0.410 0.005	● -0.410 0.005	○ -0.276 0.063	○ -0.262 0.079
Are you willing to participate in local festivals and events of your home town?	Yes	coefficient p-value	-0.225 0.134	● -0.507 0.000	● 0.507 0.000	● 0.516 0.000	0.201 0.179
	No	coefficient p-value	0.134 0.135	● 0.513 0.000	● -0.513 0.000	● -0.547 0.000	-0.187 0.214
Do you like the characteristics of local people of your home town?	Yes	coefficient p-value	-0.006 0.968	● -0.575 0.000	● 0.575 0.000	● 0.294 0.048	● 0.433 0.003
	No	coefficient p-value	0.968 0.109	● 0.487 0.001	● -0.487 0.001	-0.168 0.265	● -0.424 0.003
Do you like the dialect of your home town?	Yes	coefficient p-value	0.089 0.554	● -0.456 0.001	● 0.456 0.001	○ 0.283 0.057	● 0.308 0.037
	No	coefficient p-value	0.106 0.484	● 0.335 0.023	● -0.335 0.023	-0.184 0.221	-0.243 0.104
Do the local people in your home town sometimes sideline strangers?	Yes	coefficient p-value	○ -0.252 0.092	-0.024 0.872	0.024 0.872	0.212 0.158	-0.121 0.422
	No	coefficient p-value	● 0.299 0.044	0.086 0.570	-0.086 0.570	-0.192 0.200	0.039 0.795
Are you shy when meeting strangers?	Yes	coefficient p-value	0.086 0.570	● -0.332 0.024	● 0.332 0.024	0.183 0.224	0.240 0.108
	No	coefficient p-value	-0.083 0.583	● 0.374 0.010	● -0.374 0.010	-0.190 0.205	○ -0.282 0.057
Do you actively introduce new ideas in your life and job?	Yes	coefficient p-value	0.186 0.215	● 0.304 0.040	● -0.304 0.040	● -0.315 0.033	-0.116 0.441
	No	coefficient p-value	-0.143 0.776	-0.177 0.240	0.177 0.240	0.179 0.233	0.071 0.641

Table 6: The results of the series of the correlation analyses between regional shares of industry group and the social capital statistics

III Political awareness			Number of new plants	Group1	Group2	Goup2A	Group2B
Are you satisfied with the performance of your local politicians?	Yes	coefficient	0.038	0.092	-0.092	0.065	-0.148
		p-value	0.800	0.543	0.543	0.669	0.327
	No	coefficient	-0.014	● -0.444	● 0.444	0.092	● 0.429
		p-value	0.929	0.002	0.002	0.543	0.003
Do you feel that you are powerful enough to change local politics?	Yes	coefficient	0.037	● -0.596	● 0.596	● 0.466	● 0.335
		p-value	0.899	0.000	0.000	0.001	0.023
	No	coefficient	0.012	● 0.559	● -0.559	● -0.389	● -0.348
		p-value	0.936	0.000	0.000	0.007	0.018
In which politics are you most interested: country, prefecture or municipality?	Nation	coefficient	0.234	● 0.429	● -0.429	● -0.427	-0.178
		p-value	0.117	0.003	0.003	0.003	0.237
	Prefecture	coefficient	○ -0.259	● -0.417	● 0.417	● 0.350	0.218
		p-value	0.082	0.004	0.004	0.017	0.146
	Municipality	coefficient	0.055	-0.087	0.087	○ 0.257	-0.084
		p-value	0.716	0.567	0.567	0.084	0.577
Do you agree that changes in national politics do not influence your standard of living?	Yes	coefficient	-0.101	-0.232	0.232	○ 0.279	0.062
		p-value	0.502	0.122	0.122	0.061	0.684
	No	coefficient	0.089	● 0.302	● -0.302	● -0.353	-0.009
		p-value	0.556	0.041	0.041	0.016	0.558

IV Religious faith			Number of new plants	Group1	Group2	Goup2A	Group2B
Do you feel that you are mentally connected with your ancestors?	Yes	coefficient	-0.227	○ -0.278	○ 0.278	● 0.475	-0.024
		p-value	0.129	0.061	0.061	0.001	0.872
	No	coefficient	0.210	● 0.344	● -0.344	● -0.489	-0.038
		p-value	0.161	0.019	0.019	0.001	0.800
Do you feel that praying to God or Buddha for a wish sometimes makes the wish come true?	Yes	coefficient	0.027	-0.156	0.156	● 0.358	-0.078
		p-value	0.857	0.302	0.302	0.015	0.605
	No	coefficient	0.028	0.196	-0.196	● -0.461	0.106
		p-value	0.852	0.193	0.193	0.001	0.484
Do you want to worship or believe in a deity such as God or Buddha?	Yes	coefficient	○ -0.279	-0.180	0.180	● 0.342	-0.040
		p-value	0.061	0.232	0.232	0.020	0.790
	No	coefficient	○ 0.253	-0.047	0.047	-0.169	0.171
		p-value	0.090	0.756	0.756	0.263	0.257
Do you agree that there is no afterworld?	Yes	coefficient	0.007	0.004	-0.004	0.094	-0.070
		p-value	0.964	0.981	0.981	0.533	0.643
	No	coefficient	0.027	0.121	-0.121	-0.183	-0.056
		p-value	0.861	0.423	0.423	0.223	0.969

V Moral and ethics			Number of new plants	Group1	Group2	Goup2A	Group2B
Do you want to participate in volunteer activities for the disabled and elderly?	Yes	coefficient	0.058	-0.121	0.121	0.120	0.050
		p-value	0.702	0.424	0.424	0.428	0.740
	No	coefficient	-0.046	-0.012	0.012	-0.176	0.137
		p-value	0.761	0.936	0.936	0.241	0.363
Do you agree that individual rights can be restricted for public benefits?	Yes	coefficient	● -0.300	-0.011	0.011	○ 0.260	-0.171
		p-value	0.043	0.943	0.943	0.080	0.257
	No	coefficient	● 0.374	0.032	-0.032	● -0.314	0.185
		p-value	0.010	0.832	0.832	0.033	0.219
Do you feel that working is burdensome?	Yes	coefficient	0.049	-0.108	0.108	-0.067	0.167
		p-value	0.747	0.475	0.475	0.656	0.266
	No	coefficient	-0.072	0.115	-0.115	0.110	-0.205
		p-value	0.632	0.448	0.448	0.467	0.172
Are you willing to continue working even if you are wealthy?	Yes	coefficient	0.063	0.139	-0.139	● 0.321	● -0.379
		p-value	0.678	0.358	0.358	0.030	0.009
	No	coefficient	-0.010	0.101	-0.101	● -0.477	0.223
		p-value	0.948	0.506	0.506	0.001	0.137
Do you agree that lying is unforgivable?	Yes	coefficient	-0.058	● -0.526	● 0.526	● 0.323	● 0.358
		p-value	0.703	0.000	0.000	0.028	0.015
	No	coefficient	0.029	● 0.366	● -0.366	● -0.399	-0.127
		p-value	0.848	0.012	0.012	0.006	0.402
Do you agree that having a sexual relationship with others than one's spouse is unforgivable?	Yes	coefficient	0.025	-0.001	0.001	0.009	-0.005
		p-value	0.869	0.993	0.993	0.952	0.973
	No	coefficient	-0.016	0.236	-0.236	○ -0.268	-0.075
		p-value	0.918	0.114	0.114	0.072	0.623
Do you agree that gambling is crime or sin	Yes	coefficient	● -0.304	● -0.406	● 0.406	● 0.323	0.225
		p-value	0.040	0.005	0.005	0.029	0.133
	No	coefficient	● 0.292	● 0.361	● -0.361	● -0.335	-0.167
		p-value	0.049	0.014	0.014	0.023	0.268

tech industries in Group 2A are more likely to develop in regions with better inter-personal trust and relationships. In addition, in contrast to Group 2A, industries in Group 1 are more distributed towards regions without such institutional environment. Thus, local conditions of interpersonal trust and relationships are indeed correlated with tie-based locational decisions by Group 2A industries.

In addition, many significant correlations are found in the category of community identity. For Group 2A, the most significant correlation is found to be the frequency of participation in local festivals and public events, which indicates that there are more opportunities for informal interactions. Moreover, the regional share of Group 2A tends to increase as the regional people identify themselves as local residents and relish local norms, conventions and dialects. Furthermore, the negative correlations appeared for the hesitance to introduce new ideas and weakly for the local tendency to sideline strangers from the outside. Combined with the previous result, this may imply that the quality of social capital improves as people are less open to new ideas and external factors and cooperation, while they value their locality.

A positive influence is also found in political awareness, which is useful to show the degree that much local people are interested or involved in local politics. It is clear that people are most interested in the politics of prefecture and municipalities, rather than nations and prefectures. However, they still weakly consider that national politics does affect their standard of living. They also consider that they are sufficiently powerful enough to change local policies. Therefore, it seems that the development of the Group 2A is correlated with the high level of political awareness.

The greatest correlation to Group 2A is found in the categories of religious faith, morals and ethics, which are expected to reinforce access and mobilization of social ties. Positive significances are found for the first three questions, all of which characterize the religiosity of the local people. Apparently, such religious sincerity improves the trustworthiness among local people and contributes to smooth collective behaviours. In addition, in the moral and ethics category, great significances are found in the unacceptance to lying and gambling. This can be interpreted as the trustworthiness of local people. Therefore, even the religious and moral character of locality is correlated with the rate of industry formation in Group 2A.

In essence, this analysis reveals that the relative share of new plant locations in those industries tends to grow in regions with higher levels of institutional environment. Since Group 2A largely consists of high-tech industries, the growth of high-tech industries is

positively associated with the development of institutional environment and social ties supported by the environment.

4. Conclurions

Based on the overall findings of this study, the influence of social ties becomes more significant for Group 2A. Hence the importance of social ties is not uniform across industries, and specific groups of industries more often gain locational choice through social ties. In addition, the results revealed many significant correlations including how institutional environments are positively associated with the regional share of industries in Group 2A for all categories. This indicates that social capital is in fact one of the important bases of industrial specialization. This is particularly true for industries in Group 2A that utilize resources derived from social ties. The findings of this study are summarized in the analytical framework in Table 1.

Manufacturing industries in Group 2A are considered as Type I, whose locational decisions are more influenced by social ties supported by the quality of local institutional environments. In contrast, manufacturing industries in Group 1 emphasize other locational advantages such as highway access and industrial zones. In this case, the regional share of the industries is inversely correlated with the quality of institutional environment. Therefore, Group 1 should be considered as Type VI.

Finally, in regard to the first hypothesis, the gross number of new plant locations is not associated with any of the institutional indices. In addition, there is significant industrial variety in the influence of institutional environments in the regional share analysis. Therefore, particular industries enjoy greater benefits due to these enhanced institutional environments. Concerning the second hypothesis, the influence of institutional environments is significantly positive for new plant formations whose locations are more determined by social ties and the impact is even negative for other industries. Therefore, we conclude that the influence of institutional environments is only positive for the formation of new plants of industries whose primary locational determinants are oriented toward social ties, which supports both of our hypotheses.

Note

- 1) Also, regarding empirical studies, Cooke et al. (2005) evaluated the impact of social capital on the performance of local small- and medium-sized enterprises in 12 UK regions. Beugelsdijk and Schaik, (2005) investigated the regional differences in the social capital index across western European regions and its influence on regional economic development. Iyer et al. (2005) examined the spatial variety of social capital in the US, while Miguélez et al. (2005) determined that enhanced regional social capital yielded more patents. In addition, many recent studies emphasized the role of social capital in the regional innovation process (Hauser, 2007; Echebarria & Barrutia, 2011).
- 2) Moody and Paxton (2009) argued that, among the many definitions of social capital, there are two commonalities. First, certain social and economic actions are facilitated through the access and mobilization of social ties. Second, the access and mobilization of social ties are supported by the quality of institutional factors such as trust, shared norms, beliefs, and values (Lin, 2008).
- 3) The author prefers using “social ties” rather than “social network” since “network” emphasizes the roles of network structures and actors’ positions within the structure. This focus on dyadic ties follows the approach advocated by Tomlinson (2010).
- 4) An undeveloped version of Table 1 can be found in Baker and Faulkner (2008, pp. 1538).
- 5) The plants in the questionnaire survey are disaggregated into four types. First, a production facility integrated with a headquarters, which concurrently hold management and administrative functions. Second, a hub production facility specializing only in production, whose production capacity is the largest in the firm. Third, a periphery production facility that takes partial charge of the production of a hub production facility (the second type). Fourth, a new enterprise production facility that is used to promote R&D and project venture businesses. The percentages of the respondents in the first, second, third and fourth types of plants are 38.2%, 28.5%, 21.9% and 8.4%, respectively, from 1997 to 2003, and 3.0% of the plants do not belong to any of the four types. In the analysis, all plant types are aggregated by allowing each industry and region to have different proportions of those types of plants.
- 6) Regarding the average size of the sample plants, the average number of employees is 38.4 and the average size of the area of land is 11, 880 km². This implies two things. First, the plants are large- or medium-sized and the sample excludes small ones, such as those operated only by family members. In addition, the medium-sized plant can either be a medium-sized enterprise or the branch plant of a large enterprise, which we cannot discern in this study. Second, the location of a plant has a reasonable impact on the local economy and society, which might externally spawn related businesses that support production and absorb the incomes of the employees.
- 7) This institutional survey is the last and latest survey conducted by the agency. This is why the data of both location and institutional survey is relatively old.
- 8) The selection followed the literature review of Guiso et al. (2006), whose questions are particularly concerned with the norms and networks that help people act collectively (Woolcock and Narayan 2002).

- 9) Although there are originally only 22 manufacturing SIC industries, leather and petroleum industries are removed from the data beforehand, because there is an insufficient number of samples available to characterize their location profiles.
- 10) Furthermore, in drawing the cluster dendrogram, some minor determinants are removed beforehand because the share of those determinants is significantly small, and therefore it cannot be a major location factor. Minor determinants (with share percentage in parenthesis) are as follows: proximity to airport (0.987%), harbour (1.285%) and railroad (0.589%). Moreover, these transportation means are unavailable at all locations and the importance must vary in accordance with their availability. If a particular industrial activity is concentrated on an isolated island, proximity to airport and harbour would be more important for the industry. However, this does not necessarily mean that the industry emphasizes those proximities in nature, but rather that it emphasizes them only because it thrived in the proximity to the particular transportation means. In order to eliminate such biases, this cluster analysis disregards those three determinants.

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