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Vorstand: o.Univ.Prof.Dr.Walter B.Stöhr
A-1090 Wien, Augasse 2-6, Tel. (0222) 34-05-25

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Walter B. Stöhr

Regional Technological and Institutional
Innovation
THE CASE OF THE JAPANESE
TECHNOPOLIS POLICY

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Walter B. Stöhr

Regional Technological and Institutional Innovation
The case of the Japanese Technopolis Policy

Summary

Like in most other countries, regional policy in Japan has also gone through various phases (Sakashita 1984, Nishijima 1984): a growth centre policy phase (1962-69), a phase of 'big industrial base projects in remote areas' (1969-72), an 'industrial relocation' phase (1974-80), and most recently a phase of high technology based 'Technopolis Policy' (1983 -). Whereas the earlier strategies were essentially based on central agency and large corporate inputs, the more recent Technopolis Policy relies mainly on the mobilization of decentralized institutional inputs and what might be called regional endogenous development (Stöhr 1984).

The main objective of Japanese Technopolis Policy is two-fold: regionally, the development of less developed areas by high-technology industries; nationally, in general to promote high-tech industries which need industrial land, industrial water and an environment suitable for creative research. An essential characteristic of this policy is the promotion of regional institutional structures able to generate and sustain technological and institutional innovation. The key structures for this regional innovation process are regional Innovation Promotion Organizations as well as regional Institutes for Applied Industrial Research. These are structured in what is called "third sector" form, integrating local government, local business and local university on a territorial basis.

The role of national government is reduced to setting guidelines for Technopolises (during the observation period 19 were designated or under consideration), to financially support the establishment of the forementioned regional Applied Research and Innovation Promotion Organizations, to give tax incentives and financial assistance for the technological upgrading of (particularly small) firms in Technopolis areas.

The present paper describes the spatial distribution of Research and Development (R + D) functions in Japan and subsequently analyzes the basic structure of the Japanese Technopolis policy, its main actors, and the progress achieved until the end of 1984, based on a study trip to Japan which the author undertook in the latter part of that year.

Decentralization of manufacturing vs. that of R+D activities

The earlier phases of Japanese regional policy have been accompanied by a reduction of inter-regional income disparities until 1978 and of inter-regional differentials of economic growth (Sakashita 1984). This policy has not been able to lead to a decentralization of R+D activities, however:

The enclosed map 1 shows that R + D units of multi-locational private companies in 1981/82 were strongly concentrated in the major metropolitan areas, particularly around Tokyo and Osaka, as were R + D units of independent (single-location) private firms (Map 2). This applies also to R+D units attached to Central Government Agencies (Map 3). In Japan however there exist also a great number of research and development institutes sponsored by local (prefectural) government. These as well as Engineering and Science Faculties of Universities and relevant post-graduate courses were much more widely distributed (Maps 4,5 and 6). They however had apparently not been linked enough with each other and with R+D activities of private companies to actually promote a more decentralized distribution of private R+D functions.

The Technopolis policy of the Japanese government can be interpreted as an attempt to induce a decentralization also of private entrepreneurial R+D activities related to high-technology industries by interlinking these three groups of actors at the local level in the form of local "third-sector" industrial technology promotion organizations mentioned. The co-financing of local "third-sector" innovation promotion and applied industrial research organizations seems to be the major innovation in the government's Technopolis policy and is hoped to be an important

factor for touching off a more self-sustained technological development of less developed peripheral areas. It is too early yet to judge the effectiveness of this new policy.

The spatial distribution of Technopolis areas

In July, 1983, the Japanese government passed the "Law for Accelerating the Regional Development based upon High-technology Industrial Complexes (Technopolis Law)", formally as "a new strategy for the development of relatively backward regions, aiming at the creation of attractive towns in which industry, academics and residential space are closely interrelated" (MITI, 1984/a, p.1).

Within the period of almost one and a half years after passing the Law, 14 Technopolises had been approved by the Central Government by the end of November, 1984, and another 5 were under consideration.

The Technopolises approved by November, 1984, were the following (Map 7):

| name of technopolis | Prefecture | month of approval |
|---------------------|------------|-------------------|
| Nagaoka | Niigata | March, 1984 |
| Hamamatsu | Shizuoka | March, 1984 |
| Toyama | Toyama | March, 1984 |
| Hiroshima Chuo | Hiroshima | March, 1984 |
| Ube | Yamaguchi | March, 1984 |

| | | |
|------------------|--------------|-----------------|
| Kenhoku-Kunizaki | Oita | March, 1984 |
| Kumamoto | Kumamoto | March, 1984 |
| Miyazaki | Miyazaki | March, 1984 |
| Kokubu-hayato | Kagoshima | March, 1984 |
| | | |
| Akita | Akita | May, 1984 |
| Utsunomiya | Tochigi | May, 1984 |
| | | |
| Hakodate | Hokkaido | July, 1984 |
| Kibikogen | Okayama | August, 1984 |
| Kurume-Tosu | Fukuoka-Saga | September, 1984 |

These Technopolises are widely distributed over most regions of Japan, particularly over peripheral areas.

Of the first 9 Technopolises approved almost half, i.e. 4, are situated in the westernmost island of Kyushu, a large less developed region. This fact can be considered to express the priority given to the Technopolis policy to less developed areas, but it is also due to the great local initiatives with which high-tech industries had been promoted by many Prefectures of Kyushu island already during the preceding years. The next three approvals then referred to Technopolis areas in the North of Honshu and in the northernmost island of Hokkaido, both of which are also generally considered less developed.

This seems to reflect both the priority given to local initiative (particularly regarding Kyushu) and the concern given to the promotion of less developed areas. The fact that of the 14 Technopolises approved so far only 3 are located on the North-Western Japan Sea side, generally considered disadvantaged in respect to

industrial development (in part due to more extreme climate), however also expresses the bias in the government's infrastructure policy (particularly transport policy) which has generally favoured the Pacific side of the country.

The 5 last Technopolis areas which (as of end Nov., 1984) were under consideration or in preparation are:

| name: | Prefecture: |
|----------------|-------------|
| Sasebo | Nagasaki |
| Aomori | Aomori |
| Cobo | Wakayama |
| Western Harima | Hyogo |
| Western Kagawa | Kagawa |

Of these, again only one is located on the Japan Sea side (Aomori).

The requirements for an area to qualify as a Technopolis are (MITI, 1984/a, p.3):

- * areas where industries are not excessively concentrated,
- * areas containing/or close to cities expected to be a center of industrial activities,
- * vicinity of a university offering courses on high technology,
- * vicinity of a considerable number of business enterprises already existing,
- * in some cases also the vicinity of a "mother city" of at least 150.000 inhabitants "to provide urban convenienceto Technopolis residents" was considered an important

prerequisite,

- * easy access to rapid transportation facilities (especially airports, high-speed railroad 'Shinkansen').

Particularly the latter two conditions are to a considerable extent determined by prior governmental infrastructure investment and possible biases in it.

- * existence / or formation of a local high technology promotion organization, usually of the type called "Third Sector" (to distinguish it from purely private or pure government organizations) in Japan, composed of Local (usually Prefecture) Government, local university (ies) and private enterprise. The task of this local "Third Sector" organization is to "provide the service facilitating financing to business enterprises and other services necessary for industrial development based on high technology" (p.3)

A further pragmatic prerequisite so far was that there should be only one Technopolis proposed in each Prefecture ¹⁾.

These Technopolises were aimed at promoting high-technology industrial complexes including sectors such as electronics, computer and information industry, bioindustry, fine ceramics and new materials industries. Their sustained development should be secured by close interaction with existing or newly to be created local research institutes, with the above mentioned technology promotion organizations, and local government. ²⁾

Although the Central Government has launched the Technopolis idea and is attempting to channel its further development, the implementation of this policy and the mobilization of the required

resources is explicitly left to the initiative of local government. It is therefore often inofficially called a "money-saving policy" (for the central government) as most of the inputs required have to be mobilized by local communities. In official language this is also called "Setting up a basis for the independent development of regional economies" which "are approaching the point where they can be independent of public investment and take charge of their own growth" and in which localities "can be expected to make optimum use of regional characteristics" (MITI, 1984/a, p.1).

This change in regional policy from one formerly predominantly centrally steered to one left primarily to local initiatives can be interpreted in two ways:

First, that central government tries to rid itself of its responsibility for regional development and lets individual regions wrestle with their own fate. Such an interpretation is propagated by the fiscal crisis of the central state which applies to most industrialized countries and also to Japan.

Secondly, it can also be interpreted as a policy to augment total resource mobilization by increasing the participation of local and regional communities (in addition to those at the national level). In this sense, the Japanese Technopolis Policy certainly has had a substantial effect on the mobilization of additional local and regional initiatives and resources.

Central government inputs to the Technopolis policy

It can not be said that the central government has financially withdrawn from regional policy by the new Technopolis concept. Apart from the formulation and propagation of this new concept and the formal designation of Technopolis areas, financial

assistance to Technopolis policy is given by the Central Government in the following ways (MITI, 1984/a, p.7 f.):

By budgetary measures via

- * support for regional R+D, mainly in the form of aid for the establishment or expansion of "third-sector" research institutions and public laboratories , by promotion of joint industrial-academic-governmental research projects, as well as by support of R+D for medium-sized local industries.

- * financial assistance to small enterprises in their technological upgrading, in providing them with low-interest loans (jointly with metropolitan and prefectural governments), as well as in the formation of diversified industrial complexes in Technopolises.

The support under the above two items in the fiscal year 1984 was reported by MITI to have been of a magnitude of 1.500 mill.Yens per Technopolis on an average.

- * funding support for the operating budget of the above mentioned "third sector" industrial technology promotion organizations which in each region are to be the central bodies serving to promote the Technopolis plan: by debt guarantee, training and guidance, surveys and research on social systems etc. . In the fiscal year 1984 these contributions by the central government have averaged 600 mill. Yens per Technopolis, the maximum having been 2.000 mill. Yens in the case of Yamaguchi Technopolis.

By tax measures, especially

- * writing-off of contributions to the above mentioned 'third sector' organizations,
- * special depreciation allowance of 30 % for the first fiscal year for certain newly constructed industrial machines (including related buildings and attached facilities used for laboratory research) and 15 % depreciation allowance for buildings and attached facilities within Technopolis regions by corporations carrying on business in specific advanced technology industries.

By reduction of interest rates, especially

- * expansion of the Favorable Interest System for Regional Technological Development (granted by the Japan Development Bank and the Hokkaido - Tohoku Development Corporation) to Technopolis Areas at a specially reduced interest rate.

As mentioned above, particular emphasis is given by Central Government to the expansion of local R+D capacities. In 5 of the Technopolises approved until the end of 1984, MITI has contributed 1 Mill. Yens each to the establishment of a research institute of applied industrial technology in specific fields, so e.g. an Institute for Research on Electronic Machine Technology and an Institute for Research on Medical Appliance Technology (Chizuoka Technopolis), Centers for Research on Life Sciences and for Exchange in Advanced Technology (Toyama Technopolis), a High Technology Research Institute and a Training Center for Electronics (Kenhoku-Kunizaki Technopolis), a Centre for Research on Applied Electronics Machinery Technology (Kumamoto Technopolis), and a Center for Research on the Development of Fine Ceramics Products (Kokubu-Hayato Technopolis).

In most cases these new centers for applied industrial research (so-called "third sector" institutions) are financed to one third each by central government, by prefectural government and by private enterprise. The enterprises participating in these applied research centers are usually ones which individually would not be able to carry out this research (mostly small to medium sized firms); the establishment these research centers however enables them to conduct their own (confidential) research but at the same time to interchange research experiences amongst each other or to do common research if they so choose. This differentiated possibility for independent and joint research, as well as the selective exchange of research results has been successfully practised in Japan already in more centralized form, so e.g. in a recently initiated large research park of various pharmaceutical firms in the neighborhood of the New Academic Town Tsukuba, just outside of Tokyo. In that research park each firm has its own separate research center while there also exists a large common building within which research and other information is exchanged.

Regional Inputs to the Technopolis policy

The Technopolis policy of the Japanese Government was not an invention of a central agency but rather its effort to provide an organizational national framework for, and to reinforce, different components of trends already ongoing at regional levels.

The basic idea was derived from the high-technology areas in the

USA of the Silicon Valley type and its successors in that and other countries. These foreign pre-cursors have aroused local initiatives for the promotion of high-technology industries in various regions and localities of Japan, particularly in areas that had been considered underdeveloped by traditional standards, such as on the island of Kyushu.

In Kyushu, the Prefecture of Oita (total pop.1,2 mill.inhab.) in the 1970's already had undertaken initiatives to attract electronics firms and established an International Information Center. Similar initiatives were undertaken by the neighbouring Prefecture of Kumamoto and then by the other Prefectures of the island.

The list of firms which established plants in these two Prefectures reads like a Who-is-Who in high-technology industries. Besides local initiative, the basic factors for the attraction of high-technology firms are today given by MITI as: abundance of clean water, good environmental conditions, relatively cheap skilled labor of about 20 % below the national average (MITI, 1984/b, p.56, Fig.27) and a high density of modern airports.

Today close to 40 % of Japanese production of integrated circuits are located on Kyushu island. In spring 1984 a local "Advanced Technology Research Center" and a "Regional Technology Promotion Foundation", both of the "Third-sector" type described above, had been created on Kyushu Island.

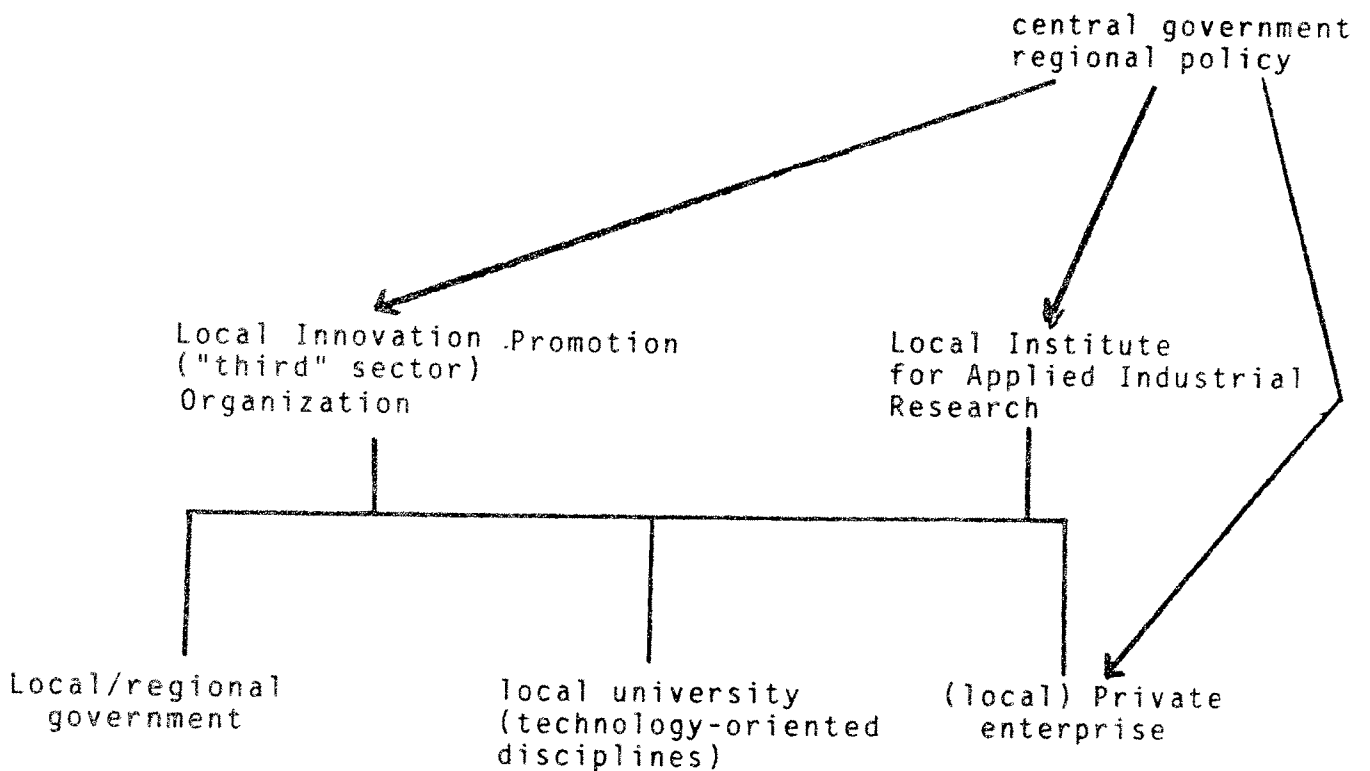
The central government has now attempted to multiply such local initiatives and incentivates them also in other parts of the country. At the same time it has tried to institutionalize them in different regions by stipulating the creation of a Local

Innovation Promotion Organisation and of a Local Institute for Applied Industrial Research, constituted by local (prefectural) government, local university and local private enterprise (see diagram). These two types of local institutions are the prerequisite for the designation of a Technopolis area and for the extension of further central government aid as described above. They are considered as catalysts for a self-sustaining local innovation process.

Diagram

High technology oriented regional policy

(Japanese "third sector" Technopolis Policy)



Newly established manufacturing plants in Technopolis areas

The fact that the establishment of new plants - mainly triggered by local initiative - had started in Technopolis areas already before these were designated as such by the Central government (and thereby included in the Central government's special Technopolis promotion scheme) is shown in the following table giving number of newly established plants and land surface occupied by them for the 13 first Technopolis areas during the 2 years preceding the passing of the Technopolis Law (1981 and 1982) and for the year following the passage of that Law (July 15, 1983 - end of August, 1984):

Table: Newly established manufacturing plants in Technopolis areas

| Technopolis Area | year 1981 | | year 1982 | | year following passage of Technopolis Law | |
|------------------|--------------|--------------------|--------------|--------------------|---|--------------------|
| | No.of plants | land occupied (ha) | No.of plants | land occupied (ha) | No.of plants | land occupied (ha) |
| Hakodate | 4 | 1.1 | 1 | 0.2 | 4 | 1.6 |
| Akita | 1 | 0.2 | 1 | 3.6 | 7 | 38.5 |
| Nagaoka | 8 | 1.8 | 3 | 1.2 | 9 | 14.8 |
| Utsunomia | 13 | 25.8 | 13 | 10.7 | 17 | 47.9 |
| Hamamatsu | 8 | 0.7 | 4 | 6.1 | 8 | 15.0 |
| Toyama | 15 | 29.3 | 17 | 11.6 | 14 | 17.4 |
| Kibigogen | 5 | 4.6 | 2 | 0.8 | 1 | 7.6 |
| Hiroshima-Chuo | 2 | 1.1 | 5 | 2.7 | 9 | 12.8 |
| Ube | 1 | 11.0 | 12 | 9.7 | 9 | 12.9 |
| Kumamoto | 6 | 5.4 | 15 | 12.0 | 11 | 6.0 |
| Kenhoku-kunizaki | 1 | 0.9 | 3 | 1.8 | 11 | 19.9 |
| Miyazaki | 1 | 0.9 | 7 | 16.2 | 16 | 39.3 |
| Kokubu-hayato | 11 | 10.0 | 4 | 4.4 | 11 | 4.9 |
| total | 84 | 142.3 | 87 | 81.0 | 128 | 238.6 |
| mean | 6.5 | 10.9 | 6.7 | 6.2 | 9.1 | 18.4 |

Source: Ministry of International Trade and Industry (MITI), Tokyo, personal information

This table shows that in each of the 2 years preceding the passage of the Technopolis Law a substantial number of new plants (total of between 80-90 per year) were already established in these areas later designated Technopolises. In the year following the passage of the Technopolis Law, this number increased by about 1/2 however: 128 new manufacturing plants were established in the 13 Technopolis areas listed. Only in one of these areas (Kibikogen) the number of newly established plants in this period was smaller than in either of the preceding years. In all the other Technopolis areas the passage of the Law appears to have had a substantial impact on the number of newly established plants. Data on further Technopolises as well as the employment effect and the sectoral composition of newly established plants had not been available yet.

Footnotes

- 1) of which there are 47 in Japan, corresponding approximately to departments or counties in other countries.
- 2) it must be mentioned that close cooperation between government and private enterprise has been a long-standing characteristic of the Japanese economy at the national level, less however at the local/regional level.

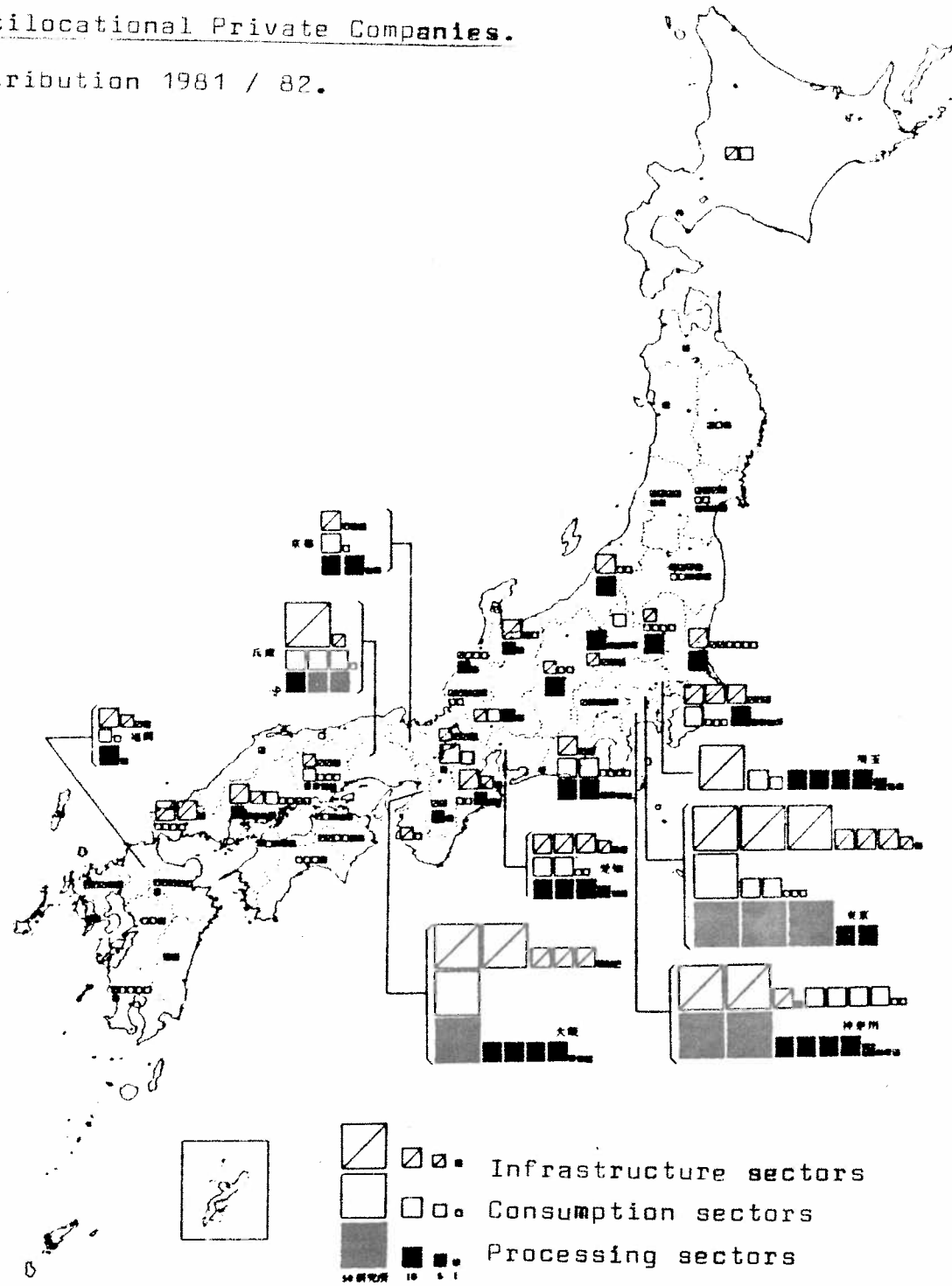
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Map 1 :

R + D Units of
Multilocal Private Companies.

Distribution 1981 / 82.

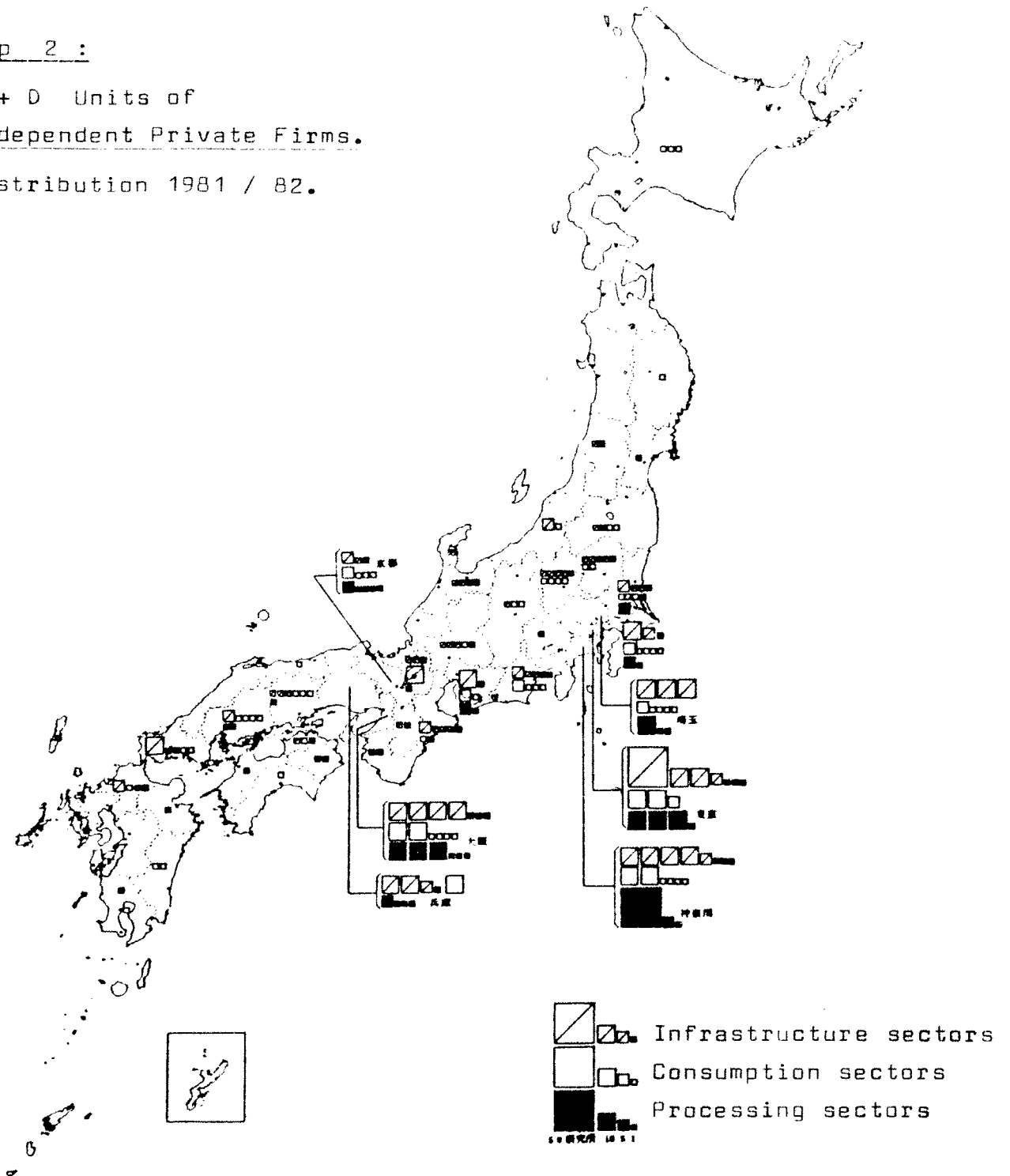


Source : Ministry of International Trade and Industry (MITI),
 Regional Development Office : "Regional Technology Maps
 of Japan", Tokyo, June 1982.

Map 2 :

R + D Units of
Independent Private Firms.

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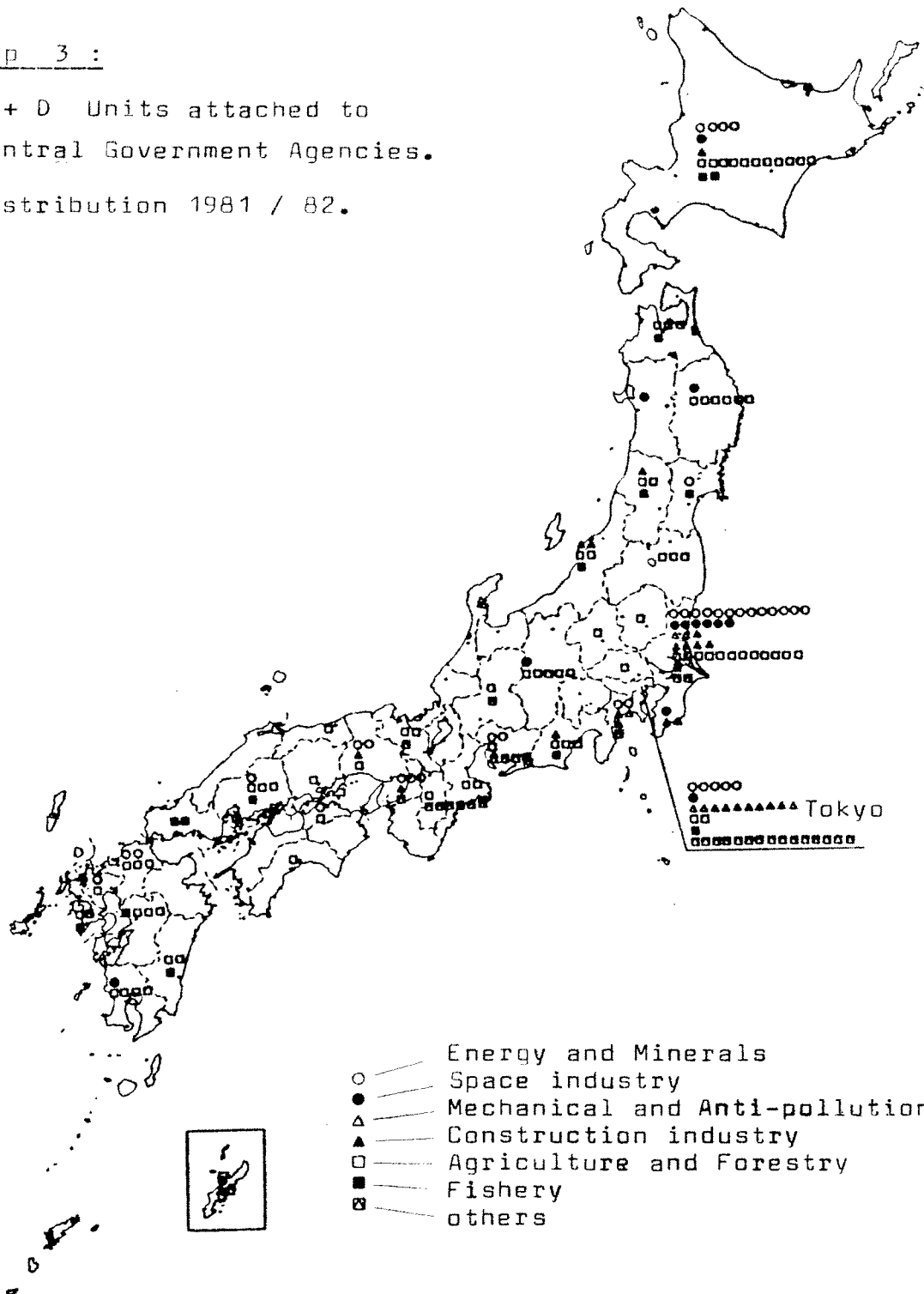


Source : Ministry of International Trade and Industry (MITI),
Regional Development Office : "Regional Technology Maps
of Japan", Tokyo, June 1982.

Map 3 :

R + D Units attached to
Central Government Agencies.

Distribution 1981 / 82.

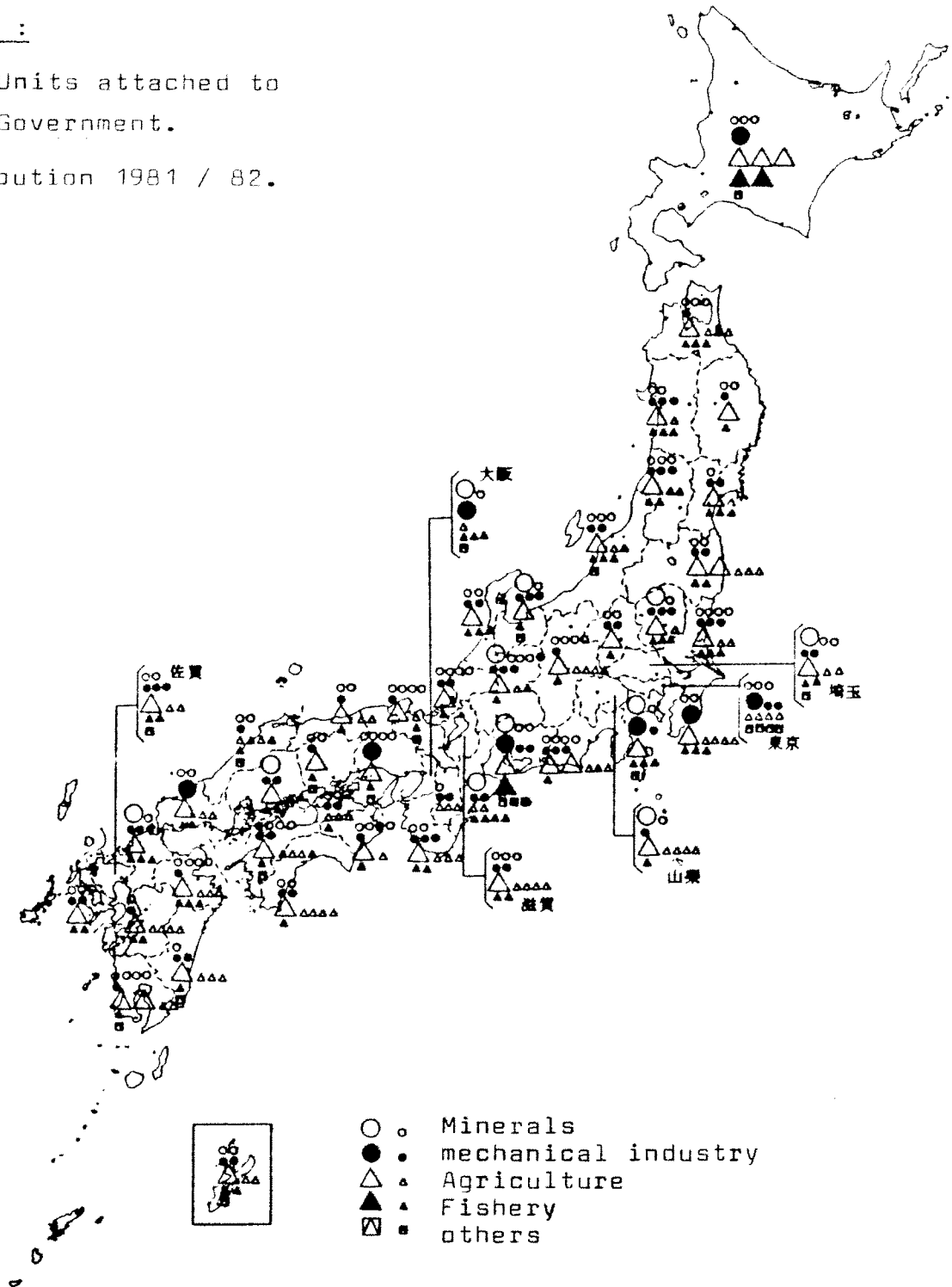


Source : Ministry of International Trade and Industry (MITI),
Regional Development Office : "Regional Technology Maps
of Japan", Tokyo, June 1982.

Map 4 :

R + D Units attached to
Local Government.

Distribution 1981 / 82.

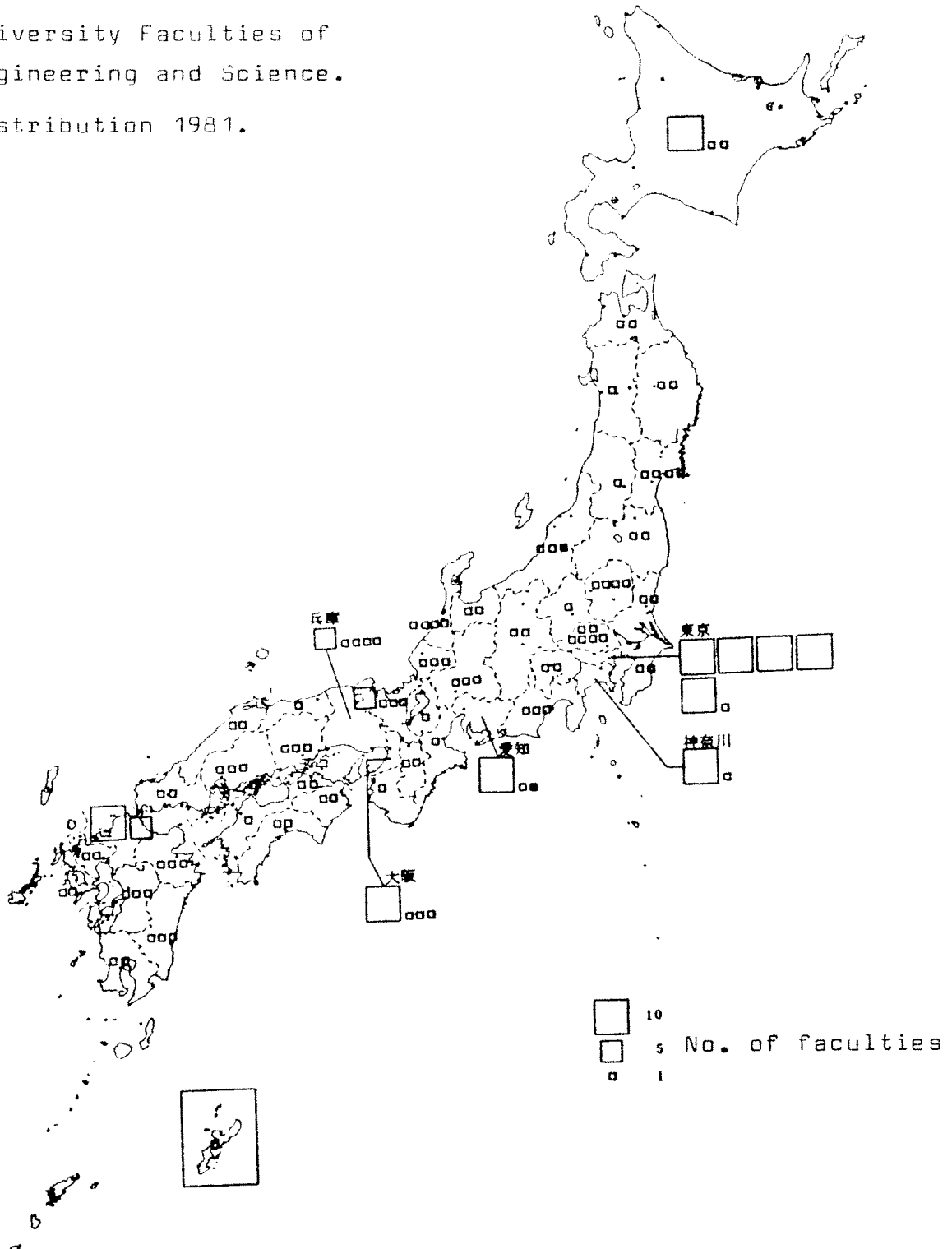


Source : Ministry of International Trade and Industry (MITI),
Regional Development Office : "Regional Technology Maps
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Map 5 :

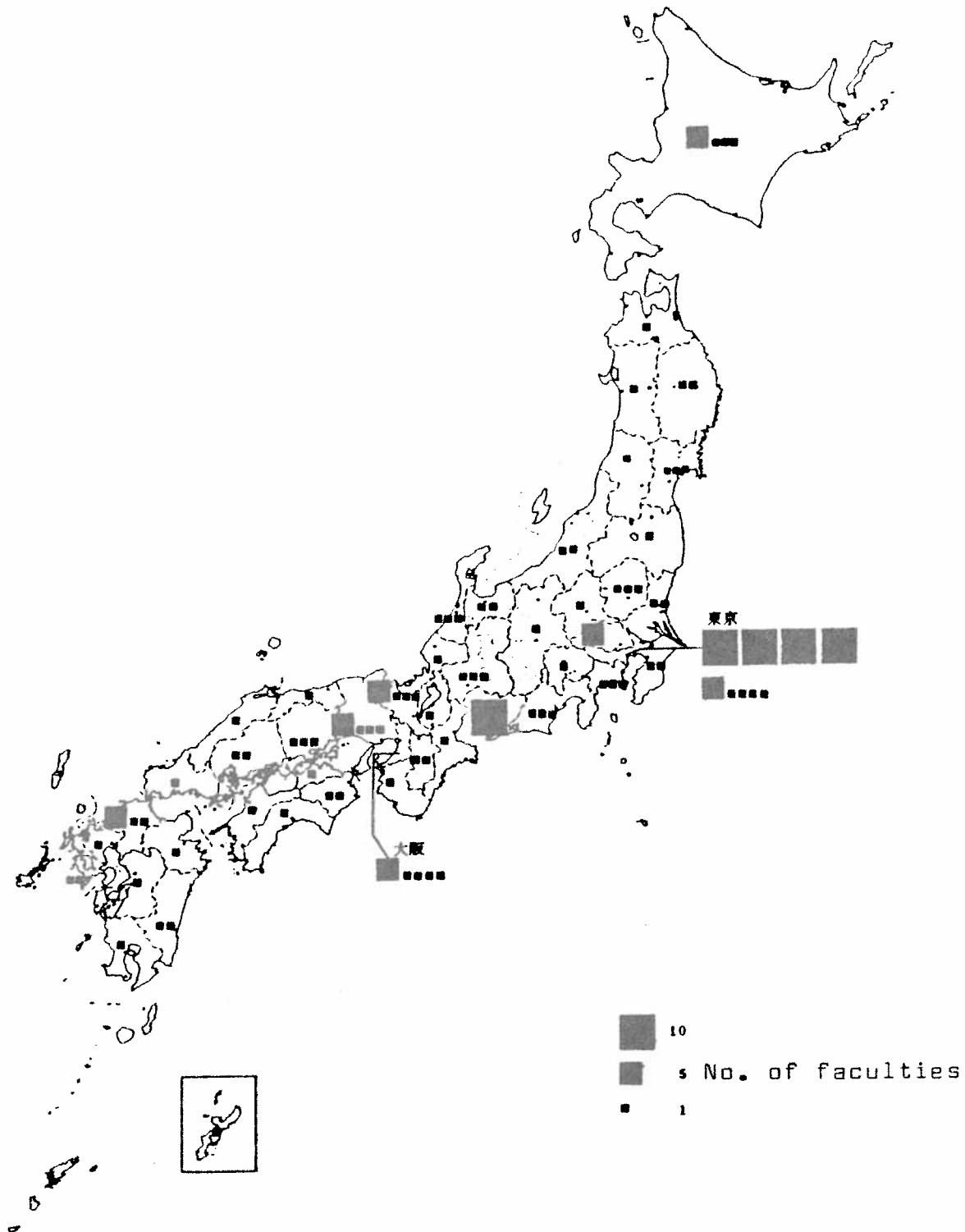
University Faculties of
Engineering and Science.

Distribution 1981.



Source : Ministry of International Trade and Industry (MITI),
Regional Development Office : "Regional Technology Maps
of Japan", Tokyo, June 1982.

Map 6 : Universities with Postgraduate Courses in Engineering and Science.
 Distribution 1981.

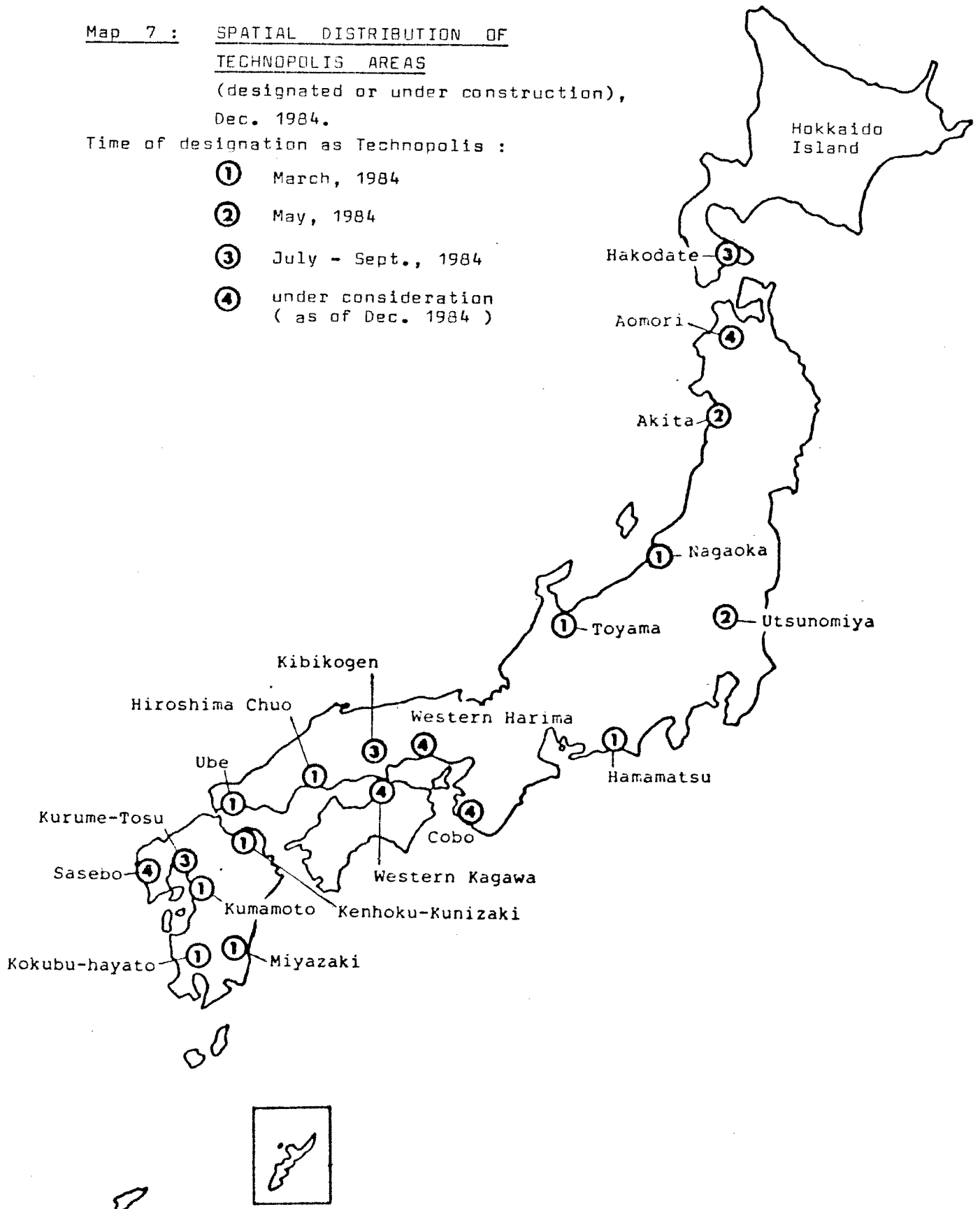


Source : Ministry of International Trade and Industry (MITI),
 Regional Development Office : "Regional Technology Maps
 of Japan", Tokyo, June 1982.

Map 7 : SPATIAL DISTRIBUTION OF
TECHNOPOLIS AREAS
 (designated or under construction),
 Dec. 1984.

Time of designation as Technopolis :

- ① March, 1984
- ② May, 1984
- ③ July - Sept., 1984
- ④ under consideration
 (as of Dec. 1984)



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Franz TÖDTLING

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I I R - DISCUSSION 32

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1) Einleitung

Die veränderten Rahmenbedingungen der 70-er Jahre waren u.a. durch eine starke Verschärfung des wirtschaftlichen Wettbewerbes insbesondere auf internationaler Ebene gekennzeichnet. Unternehmen - vor allem die exponierten Industriebetriebe - wurden gezwungen, Anpassungs- und Reorganisationsmaßnahmen durchzuführen. Die folgenden waren in diesem Zusammenhang besonders wichtig: Maßnahmen der Kapazitätsanpassung (Reduktionen, Schließungen, Erweiterungen von Produktionssparten und Betrieben), kostensenkende Maßnahmen um die Wettbewerbsfähigkeit über den Preis zu sichern (Mechanisierung, Automatisierung und Intensivierung) sowie die Einführung neuer Produkte und die Erschließung neuer Märkte.

Es ist zu erwarten, daß derartige industrielle Reorganisationsmaßnahmen in den einzelnen Regionen unterschiedlich ausgeprägt sind, da starke Unterschiede der Betriebsstruktur existieren (z.B. im Besatz mit "gefährdeten" Branchen und Betrieben), da darüberhinaus Produktionskosten regional variieren (Arbeitskosten, Transport- und Kommunikationskosten, Bodenpreise), und da schließlich auch Standortbedingungen der betrieblichen Innovation verschieden sind (Zugang zu technischer und Marktinformation, zu Forschungseinrichtungen, zu Finanzmitteln, Marktzugang, Verfügbarkeit hochqualifizierter Arbeitskräfte). Sowohl der Druck als auch die Voraussetzungen der betrieblichen Umstrukturierung sind somit regional stark unterschiedlich ausgeprägt. Es ist daher zu erwarten, daß sich dies auch in wichtigen Indikatoren der Industrieentwicklung widerspiegelt, etwa in der Entwicklung des Outputs, der Investitionen, der Beschäftigung und der Produktivität.

Im folgenden werden zunächst einige Erwartungen und Thesen zu regionalen Unterschieden der betrieblichen Reorganisation diskutiert (Abschnitt 2). Daran anschließend werden empirische Ergebnisse zur industriellen Entwicklung in österreichischen Regionen dargestellt und im Lichte des in 2) skizzierten konzeptuellen Rahmens interpretiert.

2) Strategien der betrieblichen Reorganisation und Regionen - ein konzepteller Rahmen

Eine theoretische Fundierung der vorliegenden Fragestellung kann zum einen auf der Basis vorhandener einschlägiger regionalökonomischer Theorien versucht werden. Theorien, die in diesem Zusammenhang Aussagen ermöglichen, sind beispielsweise die Produktzyklustheorie (vergl. z.B. Norton und Rees 1979), die Neofaktorproportionentheorie (Maier und Tödtling 1985 a) oder die Theorie der funktionalen Arbeitsteilung (Bade 1984). Diese Theorien erlauben zwar die Einordnung der Fragestellung in einen Makrozusammenhang der Regionalentwicklung, sie haben jedoch den Nachteil, daß sie z.T. sehr schematisch sind und z.T. zu wenig mit der Unternehmensebene verbunden sind.

Eine andere Möglichkeit ist es, von idealtypischen Strategien der Umstrukturierung auf der Unternehmensebene auszugehen, und zu versuchen, diese mit Betriebs- sowie Regionstypen zu verknüpfen und dadurch zu generalisieren. Zwangsläufig muß auch dabei die einzelbetriebliche und regionale Vielfalt stark reduziert werden. Ansätze dieser Art sind etwa bei Massey und Meegan (1978, 1982), Massey (1984), Müller (1983), Taylor und Thrift (1983), Stöhr (1985), Grabher (1985) sowie Maier und Tödtling (1985 a und b) gegeben. Als wichtige Strategien und Maßnahmen der betrieblichen Reorganisation im Zuge eines verschärften wirtschaftlichen Wettbewerbes können die folgenden betrachtet werden:

* Reduktion von Kapazitäten:

Im Falle dieser Maßnahme werden Märkte und Produktionssparten, in denen die Wettbewerbsfähigkeit nicht mehr gegeben ist, aufgegeben. Diese Maßnahme erfolgt vermutlich insbesondere dann, wenn andere Maßnahmen der Erhöhung der Wettbewerbsfähigkeit nicht erfolgreich waren oder gar nicht getätigt wurden (z.B. auf Grund von traditionellen Verhaltensmustern "alteingesessener" Unternehmer).

* Strategien der Kostensenkung (Verfahrensinnovationen, organisatorische Maßnahmen):

In diesem Falle wird versucht, die Wettbewerbsfähigkeit durch eine Verbilligung des Produktes zu sichern. Verfahrensinnovationen verändern die Relationen zwischen den Einsatzfaktoren und dem Output (Produktivität) und haben häufig eine beschäftigungs-

senkende Wirkung (dies gilt insbesondere für die auf der Ausnützung von Skalenvorteilen beruhende standardisierte Massenfertigung).

* Strategie der räumlichen Verlagerung:

Beide bisher genannten Strategien können - falls sie im Zuge der Reorganisation eines größeren Unternehmens erfolgen - mit räumlicher Verlagerung von Produktionen verbunden sein. Mögliche Motive einer solchen Verlagerung sind die Ausnutzung räumlicher Kostenunterschiede (z.B. Lohnkosten) und/oder räumlicher Unterschiede in Bezug auf sonstige Charakteristika von Produktionsfaktoren (etwa Qualifikation, Arbeitsdisziplin und -willigkeit, gewerkschaftliche Organisation von Arbeitskräften).

* Produktinnovation und Erschließung neuer Märkte:

Hier soll nicht die Wettbewerbsfähigkeit auf bestehenden Märkten über den Preis gesichert werden, sondern es wird versucht, durch die Modifikation von Produkten bzw. die Einführung neuer Produkte neue Marktsegmente zu erobern. Meist sind mit Produktinnovationen auch neue Produktionsverfahren verbunden, diese sind jedoch weniger auf die Stückkostensenkung als auf die Erreichung einer bestimmten Produktqualität ausgerichtet.

Im folgenden werden diese genannten Strategietypen kurz dargestellt, wobei insbesondere auf die Zusammenhänge zu Betriebstypen sowie zu räumlichen und regionalen Aspekten eingegangen wird.

a) Die Anpassung von Kapazitäten (Reduktion, Schließung, von Produktionssparten und Betrieben)

Im Zuge der Verlangsamung des Wirtschaftswachstums und der Verschärfung des internationalen Wettbewerbes in den 70-er Jahren gewannen Reduktionen und Schließungen von Produktionssparten und Betrieben sowie deren räumliche Aspekte im Vergleich zu den vorausgegangenen Jahrzehnten eine stärkere Bedeutung (Massey and Meegan 1982, Watts and Stafford 1986).

Der Abbau von Kapazitäten wird mit einer größeren Häufigkeit für jene Produktionen erwartet, die der internationalen Konkurrenz und v.a. der Konkurrenz der Schwellenländer stark ausgesetzt sind (Urban 1980, Muegge und Stöhr 1985, Maier und Tödtling 1985): Im Produktzyklus fortgeschrittene, standardisierte Produktionen sind davon vermutlich stärker betroffen. In der Literatur wird weiters