

# Commercialising University Inventions in Japan

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## I. INTRODUCTION

If statistics are to be believed, there are huge discrepancies between Japan and the United States regarding the cost/output equation of research results. While both countries spend roughly equal amounts of money on universities proper,<sup>1</sup> about 3 trillion Yen (3,000,000,000,000 = 3 billion Euro) Japanese universities have almost the double number of researchers (240,000 versus the United States with 130,000).<sup>2</sup> The output in terms of patents and royalties reveals huge discrepancies, however. While US universities obtained 5,100 patents, the figure in Japan stood at only 137.<sup>3</sup> Even more discrepant are the royalty fees deriving therefrom: while Japanese universities received a meagre amount of 30 million Yen, US universities managed to get 50 billion Yen, that is 1,600 times as much. In other words, with the same amount of investment in uni-

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1 In Japan about 20 % of all R&D spending, in the US about 15 %; statistics taken from K. SHIMIZU, *Daigaku no aratana infurasutorakuchâ* [New Infrastructure of Universities]: Tokugikon No. 211 (2000) 4.

2 In Japan about one third of all researchers, in the US 30 %.

3 Unfortunately, *Shimizu* does not refer to the year the statistics are related to.

versity education and research, US researchers were able to obtain 40 times more patents and 1,600 times more royalties. In a country of sparse natural resources that since its opening to the world in 1868 has issued the motto

“Knowledge shall be brought from all over the world”,<sup>4</sup>

this must be a truly alarming result.

## II. RESEARCH POLICY OF JAPAN

### 1. *Background*

When the Nobel Prize for Chemistry in the year 2000 was awarded to *Hideki Shirakawa*, Japanese newspapers did not fail to mention that the award helped “to counter the criticism that Japan was merely piggy-backing on basic research of the West”.<sup>5</sup> In the same vein, Japanese writers have tried to dispel the impression that Japan was not contributing her fair share to international basic research, mentioning that “in addition, Japan is contributing to international mega-science projects such as CERN, and has initiated large-scale international projects such as the human genome science programme. This indicates that Japan is already a major contributor to the world scientific community”.<sup>6</sup>

### 2. *Research Expenditures and Activities*

Looking at the figures, Japan’s commitment to research and development is impressive indeed. In 1998, Japan employed 925,569 persons in the sector of research and development. The comparative figure for Germany was 463,000.<sup>7</sup> It should be noted, however, that Japanese academics are only in rare cases backed up by assistant personnel, such as part-time students, secretaries or research assistants. Japanese professors virtually have to do everything themselves, ranging from making appointments to typing letters. Given the fact that typing letters in the Japanese language takes far more time than typing a comparable letter in, say, English or Spanish, this leaves much less time that can be actually spent on research.<sup>8</sup>

R & D expenditures as such have risen to a significant extent over the last couple of years. Measured against the gross national product, in 1998 Japan spent 3.06 % of the

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4 Declaration by the Emperor *Meiji* on the Modernisation of Japan.

5 Asahi Shimbun of 11 October 2000.

6 E.g., IJICHI-GOTO, in: Hemmert-Oberländer (Hrsg.), *Technology and Innovation in Japan* (London 1997) 54/55.

7 OECD, *Main Science and Technology Indicators 2000*, No. 1 (Paris 2000).

8 Which is correctly pointed out by I. WIECZOREK, *Forschung und Entwicklung in Japan: JAPAN aktuell*, December 2000, 552.

GNP on research and development. This was far more than the US (2.84 %) or Germany (2.29 %).<sup>9</sup> In fact, among the OECD countries, only Sweden's GNP share spent on research and development was higher (3.70 %).

And yet it is true that Japan still spends less of its R&D expenditures on basic research than other countries. In 1997, only 12.7 % of Japan's total expenditures for research and development were spent on basic research, 23.9 % on applied research, and 63.4 % on development. The comparable figures for basic research are 15.6 % (1996) for the US and 21.2 % (1993) for Germany.<sup>10</sup> One reason for this disparity may be due to the fact that in Japan, the private sector finances about 70 % of all R&D expenditures, of which only 6.2 % are spent on basic research.

The following table should give a better understanding on the different sources of R&D expenditures in Japan, the US, and Germany respectively:<sup>11</sup>

**Table 1: Research and Development Expenses According to the Source of Funding (in %)**

|         | Private Sector |      |      | Public |      |      | Others |      |      | From Abroad |      |      |
|---------|----------------|------|------|--------|------|------|--------|------|------|-------------|------|------|
|         | 1990           | 1995 | 1998 | 1990   | 1995 | 1998 | 1990   | 1995 | 1998 | 1990        | 1995 | 1998 |
| Japan   | 73.1           | 72.3 | 73.4 | 18.0   | 20.9 | 19.7 | 8.8    | 6.7  | 6.5  | 0.1         | 0.1  | 0.3  |
| USA     | 54.0           | 60.4 | 66.7 | 40.8   | 35.6 | 29.8 | 3.5    | 4.0  | 4.0  | -           | -    | -    |
| Germany | 63.4           | 61.1 | 61.7 | 33.9   | 36.8 | 35.6 | 0.5    | 0.3  | 0.3  | 1.6         | 1.8  | 2.4  |

**Table 2: Research and Development Expenses According to the Implementing Organisations (in %)**

|         | Private Sector |      |      | Universities |      |      | Public |      |      | Private Research Institutions |      |      |
|---------|----------------|------|------|--------------|------|------|--------|------|------|-------------------------------|------|------|
|         | 1990           | 1995 | 1998 | 1990         | 1995 | 1998 | 1990   | 1995 | 1998 | 1990                          | 1995 | 1998 |
| Japan   | 70.9           | 70.3 | 71.9 | 17.6         | 14.5 | 14.0 | 7.5    | 9.6  | 9.2  | 4.1                           | 4.8  | 4.7  |
| USA     | 71.0           | 71.9 | 74.6 | 15.4         | 15.3 | 14.4 | 10.5   | 9.6  | 7.9  | 3.0                           | 3.3  | 3.1  |
| Germany | 71.9           | 66.4 | 67.8 | 14.8         | 18.1 | 17.6 | 12.9   | 15.4 | 14.6 | 0.5                           | 0.4  | 0.4  |

<sup>9</sup> OECD (*supra* note 7) 16.

<sup>10</sup> I. WIECZOREK (*supra* note 8) 553.

<sup>11</sup> OECD, Science Technology and Industry Outlook (Paris 2000); OECD (*supra* note 7).

### 3. *Results of R&D Expenditure*

It is certainly difficult to find a universally accepted parameter of results that come out of research and development. One may use a number of academic publications, the number of awards, the technology import-export balance, or the number of patent applications and grants.

When looking at the number of academic publications, Japan's share of these when compared to the OECD countries in total was 9.9 %, Germany's share 8.0 % and the share of the US 39.5 %. The absolute number of publications between 1995 and 1997 was an annual average of 43,655 in Japan, 173,233 in the US, and 35,294 in Germany.<sup>12</sup> These sheer numbers of course do not reflect the quality of such publications.

As to the export-import balance of technology, Japan is one of the few countries that have an export surplus. In 1998, this surplus amounted to about 0.1 % of the gross national product. In the US, the surplus amounted to 0.3 %, in Germany there was a minus of 0.1 %.<sup>13</sup> For Japan, this is a remarkable turnaround from an import deficit that existed well into the 1980s. The new antitrust rules on technology transfer that were considerably relaxed over the last 10 years reflect this development (see below III).

Japan is perhaps the country with the most domestic patent applications in the world. In 1999, 405,000 patent applications were filed before the Japanese Patent Office, 360,000 by Japanese applicants. In the same year, about 150,000 patents were granted, 134,000 to Japanese applicants.<sup>14</sup> Comparable figures for the US are about 140,000 applications, for Germany 50,000 applications. While foreigners hold only about 13 % of all patents in Japan (the US 45 %, Germany 65 %), Japanese held about 21 % of all patents in the US and Germany respectively. This is also, but not only due to Japan's innovative strength. For a closer look at Japan's patent system, see below III.

### 4. *Legislation*

Apart from legislation in the field of intellectual property (see below III) and legislation on fostering patent applications by universities (see below IV), two legislative acts should be mentioned that are meant to foster research and development. For one, in November 1995 Japan passed the "Science and Technology Basic Act" that was followed by the "Science and Technology Basic Plan" of 2 June 1996. Both legal instruments envisaged a doubling of R&D spending between 1992 and 2000, apart from suggesting institutional reforms such as the promotion of joint research activities between universities and enterprises. Further, on 29 November 2000, Japan enacted the "Information Technology Basic Act" meant to help Japan become the leading nation in information technology by 2005. The Act calls for a rapid construction of a high speed

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12 OECD (*supra* note 11) 254.

13 OECD, Main Science and Technology Indicators, May 2000, 54.

14 Figures from Japan Patents and Trademarks No. 106 (2000) 4-6.

infrastructure, for measures to promote the Internet and a significant loosening of the regulations for electronic commerce.

### 5. *The Dark Side of the Moon*

The downside of Japan's advances in research and development is industrial espionage which seems to be far more widespread than in other countries:

“Stealing foreign technology, while not being explicitly promoted, is silently tolerated, since after all the Patent Office comes under MITI's jurisdiction. Hardly any other country gets so much criticism for plump industrial espionage, and hardly any other country gets caught so often. Not even the largest and best reputed companies are missing on the list”.<sup>15</sup>

“Also the half-official Japanese organisation for external trade has fulfilled functions of the secret service, gathered information and even encouraged espionage ... Yet the axis everything revolves around is the Japanese Ministry of Trade and Industry (MITI). A small department of the *Naicho*, the news service of the Japanese Prime Minister, is also involved in supervising the actions of the network ... Japanese have also infiltrated US companies with moles (especially in Silicon Valley), have obtained valuable technical blueprints and plans by way of bribery, have used Japanese students in advanced years to obtain information about research projects of leading US universities and insights about members of the US government ... The state-owned Japanese telephone company regularly hears and reads American business long-distance calls and faxes”.<sup>16</sup>

There is also a more legitimate side to it. Particularly in the 1980s, a number of Japanese companies donated money to US and European universities in order to get privileged access to research information. Examples include:

- (1) In 1990, Hitachi opened a bio-research lab at the University of California in Irvine;
- (2) NEC set up an electronic data processing lab at the Princeton University, investing 75 million US\$;
- (3) About 22 academic chairs at MIT are sponsored by Japanese companies, with at least 1 million US\$ each.

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15 A. KRONSCHACHNER, *Strategien japanischer Unternehmen* (1996) 212.

16 *Ibid.* 213.

### III. IMITATION, INNOVATION AND TECHNICAL PROGRESS

#### 1. *Development of Intellectual Property*

Being a country of sparse national resources, Japan had to rely on entrepreneurial ingeniousness<sup>17</sup> and the promotion of inventive efforts through intellectual property (IP) rights. Turning to intellectual property rights to achieve its goals of *fukoku kyôhei* (a rich country and a strong army) and *shokusan kôgyô* (increase industrial productivity) was by no means a foregone conclusion for the Meiji state. After all, in 1721 the military Tokugawa regime which ruled the country between 1603 and 1868, proclaimed a law that prohibited technical innovations.<sup>18</sup> Nevertheless, patent systems that the Japanese had found in the United Kingdom, the United States and France, were soon identified as the motor of industrial development. The first President of the Japanese Patent Office, *Korekiyo Takahashi*, reportedly stated during a visit to the US Patent Office around the turn of the century:

“We have looked about us to see what nations are the greatest, so that we can be like them. We said: ‘What is it that makes the United States such a great nation?’, and we investigated and we found that it was patents, and so we will have patents.”<sup>19</sup>

Yet the first Japanese patent law, the *Senbai ryaku kisoku*, enacted in 1871, had to be scrapped when after one year, not a single patent application had been made. Just as well, since there would not have been any properly trained examiners for examining patents:

“If someone requests a patent for a supposedly new invention, it is extremely difficult to determine to what extent the invention is really new. In order to conduct a thorough examination, one would have to employ 50 foreigners. In employing 50 foreigners, it would be necessary to employ the same number of translators. This is certainly very expensive. But were there really so many inventions? The only invention that people talked about in these days was the invention of the rikshaw.”<sup>20</sup>

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17 The emergence of the *Zaibatsu*-Groups from the 1880s onwards owes less to governmental patronage than to tough competition, hard work and commercial astuteness: H. MORIKAWA, *Zaibatsu – The Rise and Fall of Family Enterprise Groups in Japan* (Tokyo 1992) 1-55.

18 *Shinki hatto no ofuregaki* [Ordinance Prohibiting Innovations], Ordinance of the Military Government of July 1721, reprinted in TOKKYOCHÔ [Patent Office], *Tokkyo seido 70nen shi* [70 Year History of the Patent System] (Tokyo 1955) 36.

19 Reported in US DEPARTMENT OF COMMERCE/PATENT OFFICE, *The Story of the United States Patent Office* (Washington D.C. 1972) 20.

20 Quoted from TSÛSANSHÔ [Ministry of Trade and Industry], *Shôkô seikaku-shi* [History of Trade and Industry] (Tokyo 1964) 558.

Undeterred, the subsequent Patent Monopoly Ordinance (*Senbai tokkyo jōrei*) was promulgated on 18 April 1885, and was revised in 1888, 1899, and 1909. Only in 1921 and upon the introduction of the first-to-file system, had Japanese patent law found a structure similar to that of the Patent Act of 1959 which is still in force today.

So important was the post of President of the Patent Office that *Korekiyo Takahashi*<sup>21</sup> became Minister of Finance later on and even Prime Minister for a couple of months. In 1885, the first year of its existence, 425 applications were filed under the new Patent Act, of which 99 were granted. Already in the following year, the number of applications had doubled to 1,384, while 205 patents were granted.<sup>22</sup> In 1900, for the first time the number of patent applications exceeded 2,000 (2,006 actually), in 1920, the 10,000 mark was surpassed (11,017), in 1966, the number for the first time exceeded 50,000 (55,970), in 1972, the 100,000 mark was passed (102,948), and in 1993, a peak was reached with 361,985 patent applications.<sup>23</sup>

An example of successful legislation complying with the domestic needs of a still fledgling industry was the introduction of a utility model system in 1905.<sup>24</sup> After the accession to the Paris Convention, it had become clear that only foreigners were capable of inventions that were novel world-wide. Japanese inventive activity, on the other hand, was seriously hampered by the fact that for minor improvements no special protection could be sought. What happened was that competitors were keen to imitate any such improvements, with the result that the quality of goods often deteriorated. Thus, the first Utility Model Act (or Petty Patent Act, or Sub-Patent Act, depending on the legal system) of 1905 allowed exclusive rights over “useful developments concerning the shape, arrangement or concept of a commercial object”. With a protection period of six years and the novelty requirement limited to Japan, the Act satisfied domestic needs for short-term, low-level protection without choking the patent register with long-term monopolistic rights over minor improvements. According to statistics, the utility model system has been a success.

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21 On *Takahashi*, see KOTANI, *Takahashi Korekiyo kiden no koto* [On the autobiography of *Korekiyo Takahashi*]: 32 Patent 71 [1979]. An interesting insight of the exchange between the American and Japanese Patent Office is also given by the exchange of letters between *Korekiyo Takahashi* and *Schuyler Duryee*, as reprinted by SAKAMOTO, *Takahashi Korekiyo to tokkyo gyōsei* [Korekiyo Takahashi and Patent Administration]: 8 *Tokkyo Kenkyū* [Patent Studies] 34 (1989).

22 TOKKYOKYOKU [Patent Office], *Tokkyokyoku 50nen shi* [50-Year History of the Patent Office] (Tokyo 1934) 59.

23 Figures by TOKKYOCHŌ (*supra* note 18) 134 and TOKKYOCHŌ [Patent Office], *Kōgyō shoyūken seido 100nen shi* [100 Years of History of the Industrial Property System], Vol. 3 (Tokyo 1985) 756. And finally, TOKKYOCHŌ [Patent Office], *Kōgyō shoyūken seido kono 10nen no ayumi* [The Following 10 Years of Industrial Property System] (Tokyo 1995) 345.

24 *Jitsuyō shin'an-hō* as of 15 March 1905, Law No. 21. An analysis is provided by MONYA, *Zur Rezeption des deutschen Gebrauchsmusterschutzes in Japan*, in: *Mitarbeiterfestschrift zum 70. Geburtstag von Eugen Ulmer* (München 1973) 159.

Not less interesting is the gradual expansion of patentable subject-matters. Only in 1975 was patent protection for pharmaceutical substances introduced; as of 1979, micro-organisms were deemed patentable; during the 1980s, resistance against granting patents for genetically engineered products was overcome; and in 1988, the first patent for animals was applied. In 1997, new guidelines of the Patent Office were issued to facilitate the patenting of computer software and biotechnology.

## 2. *Rules on Technology Transfer*

Apart from legal structures, Japan advanced and refined its system of IP rights also by institutional structures and administrative competencies. For one, already from the start, the Patent Office and thereby also the responsibility for preparing legislation in the field of IP rights fell into the competency of the Ministry of Agriculture and Trade, subsequently the famous or infamous Ministry of Trade and Industry (MITI), rather than the Ministry of Justice that was responsible for preparing legislation in the field of civil law in general.

Institutional control of intellectual property policy has been particularly important for Japan in the field of international technology transfer. The institutionally responsible Fair Trade Commission published its first Guidelines on International Licensing Contracts in 1968,<sup>25</sup> and subsequently revised them in 1989<sup>26</sup> and 1998.<sup>27</sup> Until 1992, all international contracts had to be notified, and until 1997 the notification requirement continued for exclusive licenses only.<sup>28</sup> The FTC was particularly concerned with so-called grant-back clauses, whereby licensees were obliged to transfer improvement inventions to the licensor without proper remuneration.<sup>29</sup>

Both the FTC and the courts, have done much to encourage the so-called parallel importation of foreign-made goods in order to lower the price level of imports.<sup>30</sup>

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25 Reprinted in English in NAKAGAWA, *Antimonopoly Legislation of Japan* (Tokyo 1984) 124.

26 H. IYORI/A. UESUGI, *The Antimonopoly Laws and Policies of Japan* (New York 1994) 467.

27 The 1998 guidelines can be found at the FTC's homepage, <<http://www.jftc.admix.go.jp>> (in English).

28 The changes were mostly due to US pressure.

29 According to H. IYORI/A. UESUGI (*supra* note 26) 305, about 20 % of all contraventions concerned grant-back clauses. The concern is understandable insofar as the forte of Japanese industry were improvement inventions (see above). About one fifth of all contracts were found faulty by the FTC.

30 The courts have allowed parallel importation of trademarked goods as early as 1970: Osaka District Court, 27 February 1970, 2 IIC 325 [1971] – “Parker”; the parallel importation of copyrighted goods is permissible unless the copyrighted work enjoys special distribution rights: Tokyo District Court, 1st July 1995, 27 IIC 570 [1996] – “Beauty and the Beast”. The importation of patented goods is permissible unless notice of the contrary has been given by the patentee: Supreme Court, 1 July 1997, 29 IIC 331 [1998] – “BBS Car Wheels III”. The FTC has repeatedly taken action against attempts to prevent lawful parallel imports by warning sole import distributors of Old Scotch Whiskey, Apple Computers and Feinberg Airguns.



## IV. UNIVERSITY INVENTIONS PHASE I: 1967-1998

When taking a look at the legal provisions applicable to the question, Sec. 35 Japanese Patent Act lays down rules for employees' inventions in general. The definition of an employee's invention requires the latter to be a result of "the present or past duties of the employee", making application to university professors quite difficult, however.<sup>31</sup> Yet, current understanding seems to shift towards a position that would make professors subject to the rules of Sec. 35, as is further explained below.

Another legal provision that influences the commercialisation of university inventions is the existence of a grace period that even allows for the filing of a patent application after the invention has been published. Here, Sec. 30 Japanese Patent Act provides for a grace period of 6 months prior to the domestic application where the publication was made by the inventor himself, or against his intentions. The provision thus resembles German and French law prior to the European Patent Convention, yet falls short of the US rules of a one-year grace period.

Already in 1967 a number of professors had founded the limited company "Japan Engineering Development" that was meant to take care of an improved use of university inventions.<sup>32</sup> It is not documented how successful this organisation was, yet it led to a general discussion about the commercial use of university inventions and ultimately to the notice of the Ministry of Education on handling universities' inventions as reprinted in the appendix. The notice followed a recommendation by a commission on "University and Research" that issued its reports in 1977.<sup>33</sup> The recommendation took into account Sec. 35 Patent Act that gave employees rights over their inventions, yet allowed employers to acquire ownership in cases of an invention made within the realm of employment. The notice gave professors a right over their inventions in principle, yet required transfer in cases of special research projects or research centres set up for special purposes. This rule is in compliance with Sec. 35: where an academic is meant to do research on a specific project, he is allocated certain duties that make the results thereof subject to the possibilities of a transfer on request.

The notice had two merciful shortcomings, however. The first related to the procedure as such. While the professor had to notify the university about an invention made, questions of ownership then had to be decided by a certain committee of professors. These committees did not prove very efficient or up to their job, as is observed by *Tamai*:

"The invention committee is one of the committees which are common in Japanese universities. In Japan every university has many important committees, such as those for managing dormitories, regulating illegal parking on the campus, and formulating a plan for evacuation in the event of a

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31 NAKAYAMA (ed.), *Tokkyo-hô* [Patent Law] (3rd ed., Tokyo 2000) 340.

32 Mentioned by Y. INOUE: *Tokkyo Kenkyû* 20 (1995) 29.

33 Y. SOMENO: *Nihon Kôgyô Shoyûken Hôgakukai Nempô* 4 (1981) 125.

disaster. All of these committees are composed of professors, so many of the committee members do not understand the importance of their duties, do not attend committee meetings, or, when they do attend, do not participate in the discussion because while they are sitting at the table, they are busy thinking about the topic of their own research ... Since the invention committee is composed of such professors, meetings are held infrequently.”<sup>34</sup>

Not only did such committees not bother much with what they deemed quibbles of ownership, but due to the infrequency of meetings a decision was often pre-empted by a professor’s publication on the subject matter. In the Japanese first-to-file system with a grace period of six months subsequent to an inventor’s own publication, this made patent protection frequently impossible.

The second issue that was not satisfactorily dealt with concerned university projects funded by industry. According to the notice, questions of ownership for future rights were meant to be determined in the contract between the university or the researcher and the outside sponsor. Yet, agreements are mostly kept vague and inventions informally passed on to industry:

“In an ‘inventor retains ownership’ system, where the inventors fear the classifying of an invention as a national invention, the inventors pass their inventions without documentation to industry. The inventions are passed to companies with whom professors have long-standing relations based on donations and the hiring of their students. There are no contract agreements between the company and the professor, only a gentlemen’s agreement that the inventor will get some remuneration if the company chooses to develop and market the invention. It is very difficult for a professor to patent and license an invention of his own. In other words, incentives for both companies and inventors to develop university inventions are weak.”<sup>35</sup>

That there is a significant potential to be tapped is revealed by a survey published by the Japan Bio-Industrial Association, according to which between 1987 and 1997, of the approximately 2,300 applications filed in this area, 38 % listed at least one university professor as an inventor.<sup>36</sup> Even in those few cases where the inventions were claimed to be national inventions, budget constraints often prevented the application as a patent, as those managing university budgets were even further removed from any intimate knowledge about the invention and its commercial potential than the committees deciding on ownership questions.

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34 K. TAMAI, CASRIP (Center for Advanced Study & Research on Intellectual Property) Publications Series 5, 115.

35 R. KNELLER, CASRIP Publications Series 5, 161.

36 Ibid.

As if this were not enough, commercialisation of inventions by the state meant a commercialisation via the Japanese Society for the Promotion of Science (JSPS) that due to legal requirements was obliged to limit exploitation to the grant of non-exclusive licences. Thereby, a private enterprise could never be sure that the same invention was not also licensed to a competitor, thus greatly diminishing an enterprise's incentive to license at all.<sup>37</sup> This overall failure to commercialise inventions via the JSPS meant in turn that not much money was spent on patenting such inventions in the first place – a vicious circle.<sup>38</sup>

## V. UNIVERSITY INVENTIONS PHASE II: THE NEW AGE

### 1. *Soul-searching in the Wake of the Economic Crisis*

The failure of the old system as such cannot explain the sudden interest in the commercialisation of university inventions after the mid-1990s. In fact, history shows that change in Japan was very rarely brought about by an insufficiency of existing structures. Rather, a number of other factors contributed to a discussion that finally brought about a legislative change in 1998.

For one, the economic crisis in Japan beginning in 1991 led to a lot of soul searching not only in the economic field, but also in the field of innovation. While Japan for more than 100 years found it comfortable and sufficient to import and improve western technology, this recipe could no longer work once Japan itself became the leader in certain technologies. Rather than the skilful adoption and improvement of outside inventions, the situation called for personal inventive activity – not easy in a society that encouraged homogeneity and compliance with social rules. When looking for innovative potential, attention was almost naturally drawn to universities that at that time in the United States, not least thanks to the Bayh-Dole Act already commanded a significant portfolio, particularly in “future” technologies such as bio-tech and computer science. If the success of US start-up companies was partly due to inventive activities by Universities, Japan – so it was reasoned – needed similar structures to achieve comparable results.

It is against this background that in 1996 a committee was formed by the Ministry of Culture to provide for proposals on a better coordination and cooperation between industry and universities (*Sandai No Renkei, Kyôryoku No Arikata Ni Kansuru Chôsa Kenkyû Kyôrokusha Kaigi*). The report of this committee in March 1997 led to the constitution of a “Acceleration Committee” (*Sandai No Renkei, Kyôryoku No Suishin Ni Kansuru Chôsa Kenkyû Kyôryokusha Kaigi*). True to its name, this committee came up with a report in December 1997 that recommended the increased patenting of basic

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37 H. MATSUBAYASHI, CASRIP Newsletter, Winter 1998, 22.

38 Y. INOUE (*supra* note 32) 38.

inventions with the aim of making such inventions useful to society. However, basic research should not primarily be viewed in terms of patentability of results. Rather, cooperation with industry should be improved also in order to facilitate the placement of university students in private enterprises. The latter aspect has to be seen against the background that beginning in the mid-90s, university graduates could no longer be certain that they would find jobs immediately after graduation – an unpleasant novelty for Japan. These positive committee resolutions together with a significant pressure on the Japanese economy to stimulate growth by innovation, already in the following year made legislation gear into action.

## 2. *The 1998 Act on the Promotion of University Inventions*

The 1998 Act was brought before the Parliament on 12 February 1998, and promulgated on 6 May 1998. The original text of the Act is so garbled that even the Japanese official gazette contains a summary that is reprinted in the appendix.

The structure of the law is unusual because in contrast to normal Japanese practice, it stipulates the concurrent jurisdiction of two ministries, the Ministry of Culture and the Ministry of Trade. There is a traditional rivalry between the Ministries of Economy and Culture regarding issues of future technology such as software, multimedia and, in this case, university research. This may well affect the actual implementation of the law in practice, yet not much can be said about this at that stage.

The approach of the law is not unelegant. In particular, it does not touch upon any contentious ownership issues that would require either a change or an explicit re-interpretation of Sec. 35 Patent Act. Rather, it relies on financial stimulation for marketing.

The main purpose of the law is to subsidise independent technology transfer centres. Owing to the fact that federal and state universities are not allowed to engage in commercial activities, in the case of these universities (the most likely to come up with any inventions in the first place), a private enterprise would be necessary. Subsidies are available in the form of financial guarantees in cases where shares are issued. The issue of shares, and thus the incorporation as a stock corporation, give the centre a more flexible structure than a limited company, as the first can issue new shares with greater facility. While professors at federal and state universities may become shareholders, they are not allowed to engage in the management of private companies. This may, however, be circumvented by employing professors as “advisors”, in particular where their own inventions are to be commercialised. One of the parameters for success or failure of the transfer centres will be the flow of information, and another the professional management of the centre. Both are, however, beyond the framework of legal rules.

3. *Current Structure and Organisation of Technology Transfer Centres in Japan*<sup>39</sup>

| Name  | University affiliation                            | Day of foundation | Operational since | Form of organisation    | Membership /Funds                               |
|---|---|-------------------|-------------------|-------------------------|---|
| Casti   | University of Tokyo                               | 3 Aug. 1998       | Dec. 1998         | Stock corporation       | Membership system                               |
| Kansai Technology Liaison Office                                      | Kyoto University, Ritsumeikan University (Kansai) | 30 Oct. 1998      | Dec. 1998         | Stock corporation       | Membership/ Membership (regional affiliation)   |
| Tôhoku Techno Arch  | Tôhoku University/ region of Tôhoku               | 5 Nov. 1998       | Dec. 1998         | Stock corporation       | Membership/ regional affiliation                |
| Gakkô hôjin Nihon University (NUBIC)                                  | Nihon University                                  | 15 Nov. 1998      | Dec. 1998         | University department   | Membership system                               |
| Gakkô hôjin Waseda University (in connection with an external office) | Waseda University                                 | 1 June 1996       | April 1999        | University department   | Funds available                                 |
| Tsukuba Liaison Kenkyûjô  | Tsukuba University                                | 20 May 1997       | April 1999        | Stock corporation       | Membership system                               |
| Rikôgaku Shinkôkai  | Tokyo Technical University                        | 6 Sept. 1946      | Aug. 1999         | Incorporated foundation | Membership by incorporated companies            |
| Gakkô hôjin Keio Juku University                                      | Keio Private University                           | 1 Nov. 1998       | Aug. 1999         | University Department   | No membership system/ No specific funds         |
| Yamaguchi TLO (Technology Licensing Office)                           | Yamaguchi University                              | 1 Nov. 1999       | Dec. 1999         | Limited company         | Membership system                               |
| Hokkaidô TLO  | Hokkaidô University/ region Hokkaidô              | 6 Dec. 1999       | Dec. 1999         | Stock corporation       | Membership system based on regional affiliation |

The above table gives an overview of the currently existing technology transfer centres (as of May 2000).

<sup>39</sup> Tokugikon No. 211 (2000) 6.

Under the 1998 Act, government assists the technology transfer centres to a significant extent. The current system envisages a subsidy of 60 % of the centre's operating costs (excluding costs related to the application of patents) paid by the state. Most of the centres seem to operate with an annual budget of 5 million Yen, 3 million of which is paid by government, 2 million by the university. In addition, government dispatches one senior officer, normally from the Patent Office, to assist a centre. This is, of course, financially attractive to the centres, yet serves the well known function of governmental bureaucracy to control private industry.

The above subsidies will be paid for five years initially. There is a good chance that this financial lifeline will be extended.

The difference in the organisational structure (stock corporations versus government departments) can be partly explained by the fact that public universities are not allowed to engage in commercial activities, while private universities have less problems in that respect. For that reason, the three universities that set up the technology transfer centres as university departments are all private universities (Nihon University, Waseda University, and Keio University).

In some cases, the technology transfer offices are not strictly affiliated with a certain university, but may rather serve all universities within a certain region. This is the case for the Kansai Centre, the Tōhoku Centre and the Hokkaidō Centre. In these cases, public universities, state universities as well as private universities are entitled to use the services of the centre, the only condition being that they find themselves in the region of the centre's operation.

The form of operation and the purposes also determine the questions of membership. The membership structure shall ensure that the purposes of commercialisation are best achieved. There are thus three categories of members. Individual researchers of universities, universities and private companies. In the case of the Kansai Centre, the membership structure comprises 27 universities, 434 individual researchers and 107 private companies.

The available data on the respective transfer centres vary a good deal. From the reports available in the special of Tokugikon (see appendix), the following can be inferred:

- (1) Tokyo University's Centre for Advanced Science and Technology Incubation (Casti) was founded with a nominal capital of 100 million Yen, a staff of nine (including two patent attorneys and one attorney), and has handled 70 patent applications in the first one and a half years of its existence (which includes applications of the same invention in different countries; in other words, the number of inventions may be much smaller).
- (2) The Kansai TLO has handled a total of 56 patent applications, two of which abroad. Over eight inventions, transfer contracts have been concluded or are under negotiation.

- (3) The Tōhoku Technology Arch was founded with a nominal share capital of 95,000,000 Yen held by 251 shareholders. In order to become a member, a fee of 20,000 Yen has to be paid, while annual fees amount to 50,000 Yen. Currently, 81 private enterprises are members. As of May 2000, 40 patent applications have been filed, five of which from abroad. Three licence contracts have been concluded.
- (4) Nihon University's NUBIC Centre runs with a staff of 14, but further details on membership of private companies, patent applications and licensing contracts are not revealed.
- (5) Waseda's transfer centre has hitherto handled about 30 cases of inventions, and applied for 20 patents. No licensing agreements have been concluded.
- (6) The Tsukuba Liaison Office relies on government support of annually 30 million Yen and employs four specialists. Further details are not disclosed.
- (7) The centre of Tokyo's Technical University has hitherto handled 50 patent applications and expects a future level of about 100 inventions per year. 60 private companies are members of this centre and have to pay a membership fee of 1,2 million Yen (large enterprises) and 300,000 Yen (small and medium size enterprises) per year. Members which request an additional information service pay 2 million Yen membership fee per year.
- (8) Keio University's tech transfer centre operates on a free for all, non-membership based system, with no particular funds set aside from the university.
- (9) Yamaguchi University's tech transfer centre started in 1995 with an informal cooperation with 10 small and medium sized enterprises. By 1997, these had become 80 companies which paid an annual fee of 50,000 Yen. The cooperation projects with industry numbered 63 in 1998 and 80 in 1999. The share capital of the limited company is held by 50 professors with an amount of 4 million Yen each. In the first three months of its existence, the Yamaguchi centre handled 10 patent applications.
- (10) Tōhoku's transfer centre was set up with a paid end share capital of 25 million Yen. Further details are not revealed.
- (11) The University of Kyūshū is currently considering setting up a technology transfer centre.

#### 4. *Dealing with the Issue of Ownership*

Some universities have started to clarify ownership issues in the context of inventions made by university employees. Waseda University, e.g., published its “Regulations Concerning Inventions by Employees of Waseda University” on 1 May 2000. The regulations concern inventions “made by a teaching employee under research work that is specifically recognised as part of the employee’s duties by the university”, in other words, not professors doing uncommissioned research work. To the extent that an invention is considered an employee’s invention, it needs to be reported to the university that in turn consults with the invention review committee on a possible transfer of rights. One core element of the regulations is the required cooperation between university and inventor in mapping out a filing strategy, both domestic and abroad.

Both in the case of employees’ inventions and in the case of free inventions by uncommissioned academics, the technology transfer centre (at least at Waseda University) follows the same rules for financial remuneration of the inventor: the university pays all expenses related to the filing and processing of the invention, while any eventual proceeds from the invention’s commercial exploitation is split in the following manner: the technology transfer centre retains 15 %, and the remaining 85 % is equally split between the inventor and the university.

Neglected for a long period of time, issues of remuneration for employed inventors are no longer a laughing matter in Japan: In news published at the end of August 2001, the internationally known Nobel candidate *Shuji Nakamura*, now resident in California, sued his former employer Nichia Corporation for some 2 billion Yen over the invention of the blue light-emitting diode (LED) used for display panels. The Mainichi newspaper writes:

“Some 436,800 patent applications were posted in Japan in 2000, a figure regarded as being the highest of any country. The number of applications by Japanese individuals and corporations – including those filed overseas – had risen to No. 2 in the world by around the early 1990s.

But a salient feature of these petitions was that they were overwhelmingly filed by businesses. In 95 percent of these cases, moreover, the inventor conceded the patent rights to the employer. Businesses reap big payoffs from the discoveries. The blue LED is one such example. Nichia raked in huge profits from the breakthrough technology, but Nakamura claimed in a Mainichi Shimbun interview that all he received for the patent was 20,000 yen.

The Patent Law stipulates that even when new discoveries are made as part of one’s employment, the researcher maintains the right to receive reasonable compensation. This provision is largely ignored by many firms, which feel that as long as the research is being conducted in accordance to company policy using company resources, the achievements rightfully belong to them.”<sup>40</sup>

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40 Editorial at <<http://mdn.mainichi.co.jp/news/archive/200108/26>>.



The newspaper even concludes that a continuation of such practices by a Japanese company will lead to the continued drain of talented Japanese researchers to foreign companies, and the weakening of corporate research and development.

Be this as it may, Sec. 35 Patent Act indeed grants the right over an invention made in the course of employment to the employee, with two qualifications: First, the employer obtains a non-exclusive license *ex lege*, and, second, the employer may obtain all rights over the invention upon proper remuneration. In the latter respect, recent decisions have tightened the screws. In the past, it was not uncommon for companies to pay the employed inventor fixed amounts of money when an invention was applied for patenting (average 5.200 Yen), and when the patent was granted (average 12.900 Yen). Less than half of all enterprises paid subsequent amounts relative to the commercial success of an invention<sup>41</sup>. Subsequent decisions have clarified that a general payment at the end of employment, common in Japan to put ageing employees out to grass, does not amount to proper remuneration<sup>42</sup>, and that a general waiver of reasonable remuneration in advance, or even a pledge to agree to the companies compensation scheme, is not permissible<sup>43</sup>. In view of these facts, universities claiming ownership over inventions made by university professors are well advised to come up with proper remuneration schemes. The ones proposed above would qualify as an equitable remuneration under Sec. 35 Patent Act. In the case of free inventors, the university would require a transfer of ownership of the invention before entitling the inventor to use the technology transfer centre to proceed with any filing for a patent.

While the above solution may certainly be an incentive for professors to transfer ownership of their inventions, it should not be overlooked that the above solution looks much less feasible in cases where the professor already has different contractual or moral obligations towards private sponsors. Since joint projects between industry and university are very common, solutions for improved commercial exploitation in these cases would be imperative to make the system succeed. There is a tendency, at least of private universities, to require a professor to enter into a written contract for accepting research money from outside sources, and to grant exclusive rights or transfer only against further payment. To what extent these guidelines are and will be followed is another matter.

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41 NIHON TOKKYO KYOKAI, *Hatsumei hoshô seido no genjô to teigen* [Current practice and rules on remuneration for employment inventions] (Tokyo 1994). The courts more or less went along, e.g. Osaka District Court, 26 April 1984, 16-1 Mutaishû 282: For details, see HEATH, *Zur Vergütung von Arbeitnehmererfindungen in Japan* [Remuneration of Employees' Inventions in Japan]: GRUR Int. 1995, 382; HINKELMANN, Case Comment, [1999] AIPPI Japan, International Edition 274.

42 Tokyo District Court, 30 September 1992: 795 Hanrei Times 278 = GRUR Int. 1995, 413.

43 Tokyo District Court, 16 April 1999: [1999] AIPPI Japan, International Edition 255.

### 5. *Information Policy*

One further aspect that should not go unnoticed is the link between the technology transfer centres and an organisation providing technology information called “Nihon Technomart” (the Japan Technomart Foundation). This foundation, sponsored by the Patent Office, offers “management of wholesome technical information, divided by geography, branches or enterprises with the aim of promoting technology diffusion”. The organisation can be used free of charge by the technology transfer centres.<sup>44</sup>

### 6. *Evaluation and Outlook*

Whether the technology transfer centres are successful in achieving the goal of promoting innovation and helping to spread valuable technology is a question that cannot necessarily be answered just by looking at the new Technology Transfer Act of 1998. Rather, success or failure may well depend on a number of extraneous factors that have to be considered in this respect.

#### a) *Ownership*

The question of ownership over university inventions has not been touched upon by the recent legislation. Given the structure of the technology transfer centres, it must rather be assumed that most of their activities derive from inventions owned by professors, as only these could freely decide whether a technology transfer centre should commercialise their inventions. In that respect it is thus vital for technology transfer centres to ensure membership of and cooperation with university professors. Membership in technology transfer centres may well make professors aware of the commercial potential of university inventions and insist on sufficient commercial exploitation. In this connection, it should be noted that it is not necessarily the question who owns the invention that determines optimal commercial exploitation, but rather the aspects of legal certainty and incentive towards commercial use:

“From the point of view of industry, under the rules of domestic universities, partner to the contract is often the individual researcher, yet the standard for determining this is extremely hazy, which causes problems. It overshadows the contract with uncertainty and limits contractual freedom.”<sup>45</sup>

While this might be so, one should not be oblivious to the fact that the grey areas have served industry pretty well when it came to obtaining ownership over university inventions in joint projects, as mentioned above. Clearer rules and professors being more clear headed about how to commercialise their inventions may thus help the economy as such, but not always be financially advantageous to industry.

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44 Homepage at <[www.jtm.or.jp](http://www.jtm.or.jp)>.

45 T. YAMAMOTO, Tokugikon No. 211 (2000) 54.

What is still missing, however, are rules on ownership that in themselves stimulate commercial exploitation of inventions. It was one of the Bayh-Dole Act's achievements to tie the benefits of ownership to the obligation for exploitation.

*b) Structure and Tasks of Technology Transfer Centres*

Technology transfer centres in most cases being private enterprises, they will have to become profitable at some stage. Government subsidies in that respect can only run for five years, and shareholders may wish to see some financial success in their investment. A structure based on the preferential treatment of members may help to cover the centre's administrative costs, yet may also limit the commercial potential of inventions.

*c) Start-up Companies and Risk Management*

Start-up companies are one of the main recipients of university inventions in the US. It is not infrequent that university employees having participated in a certain research project might be willing to take the commercial risk of exploitation by setting up a new company. In Japan, this is different for several reasons. For one, it is more difficult to raise capital in Japan than it is in the US. The on-going crisis of Japan's financial market has left investors weary and risk adverse. Capital markets being tight, would be start-up companies may not find the necessary financial means to pursue their goals. In the United States, a good many start-up companies fail. Commercial failure in the US is neither financially disastrous nor stigmatised. Both cannot be said for Japan. The social stigma of failure is enormous in commercial circles. Writing off personal debts is not only very difficult, but more often than not leads debtors to completely vanish by changing their identity and residence. Some companies in Japan specialise on providing deeply indebted salarymen with a completely new identity. This being so, commercial failure is not an experience that prepares for a future commercial success, but simply a disaster.

*d) Inventions with Commercial Potential*

The success of any scheme to commercialise inventions depends on the quality and commercial potential of the invention as such. In this respect, the American Bayh-Dole Act unleashed a potential that was already there. If the same can be said for Japan, is open to question. In this respect, it has to be pointed out that most Japanese universities, except those at the very top end, understand themselves as teaching rather than research institutions.

e) *Evaluation by Japanese Professionals*

*Kazuo Shigenobu*, patent attorney and head of the Tōhoku Technology Transfer Centre, mentions three problematic areas:<sup>46</sup>

- (1) The lack of private enterprises being interested in what he calls a “technology market”, in other words, a potential pool of business ventures actively looking for inventions with a commercial potential. Most of the existing small and medium sized enterprises have not yet grasped the full extent and potential of the intellectual property market.
- (2) Many academics do only insufficiently understand the dangers of the limited grace period (six months at the moment) in case of prior publications. Amending the relevant Sec. 30 Patent Act would thus be highly desirable.
- (3) While private enterprises might have been willing to financially support the set up of technology transfer centres, such support in the future would depend on solid commercial success. A self-sufficiency of at least 50 to 80 % would be necessary to sustain the centres. The current difficulties of the Japanese economy make this a goal which is difficult to achieve, however.

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46 Tokugikon No. 211 (2000) 23.

## VI. APPENDIX

1. *Sec. 35 Japanese Patent Act – Employees' inventions*

(1) An employer, a legal entity or a state or local public entity (hereinafter referred to as the “employer, etc.”) shall have a non-exclusive license on the patent right concerned, where an employee, an executive officer of a legal entity or a national or local public official (hereinafter referred to as the “employee, etc.”) has obtained a patent for an invention which by reason of its nature falls within the scope of the business of the employer, etc. and an act or acts resulting in the invention were part of the present or past duties of the employee, etc. performed on behalf of the employer, etc. (hereinafter referred to as an “employee’s invention”) or where a successor in title to the right to obtain a patent for an employee’s invention has obtained a patent therefore.

(2) In the case of an invention made by an employee, etc. which is not an employee’s invention, any contractual provision, service regulation or other stipulation providing in advance that the right to obtain a patent or the patent right shall pass to the employer, etc. or that he shall have an exclusive license on such invention shall be null and void.

(3) The employee, etc. shall have the right to a reasonable remuneration when he has enabled the right to obtain a patent or the patent right with respect to an employee’s invention to pass to the employer, etc. or has given the employer, etc. an exclusive right to such invention in accordance with the contract, service regulations or other stipulations.

(4) The amount of such remuneration shall be decided by reference to the profits that the employer, etc. will make from the invention and to the amount of contribution the employer, etc. made to the making of the invention.

2. *Interpretation of the above provision with respect to university inventions by the leading commentary on the Japanese Patent Act:*

“It is difficult to determine to what extent inventions by members of a university can be said to be ‘part of the past or present duties of the employee’. Since the scholarly research is part of the university’s freedom of research, employees of universities can hardly be compared to normal employees. The German law on the Invention of Employees (*Arbeitnehmererfindungsgesetz*) stipulates in Sec. 42 para.1 that inventions of university members shall be treated as free inventions that exclusively belong to the inventor. In contrast to commercial enterprises, universities aim at scientific and technical research rather than the investment of resources with the aim of gaining a profit (Sec. 53 Japanese University Law). For this reason, the assumption of Sec. 35 Patent Act cannot be applied to university employees. While the inventions of university members thus fall dogmatically outside the scope of Sec. 35, the law formally does not distinguish such inventions from those made by employees of commercial enterprises. Because of this dichotomy, no uniform treatment of such inventions can be found.

Although most universities have set up their own guidelines on the administration of inventions, wide-spread exceptions have prevented their proper functioning. The Research Group on University and Science has therefore published a report on ‘The Administration of Patent Inventions of University Employees’ in June 1977. Based on this report, the Ministry of Education has published a note requesting all public universities to set up provisions for handling inventions of their employees. Accordingly, most of the public universities have complied with this request and enacted the model-provisions of the Ministry of Education.”<sup>47</sup>

3. *Notice of the Ministry of Education on Handling Universities Employees’ Inventions (“Basic Plan”)*<sup>48</sup>

*Sec. 1 Purpose*

The purpose of this “basic plan” is to clarify how to handle patents of inventions by universities’ employees in order to envisage how to make the results of such studies useful for society and help the upbringing of scientific studies.

*Sec. 2 Definitions*

- (1) “Universities” shall mean ... those universities funded completely or in part by public monies.
- (2) “Employees” shall mean the Dean of the University, professors, assistant professors, lecturers and assistants.
- (3) “Invention” shall mean a work with a certain degree of creativity containing a technical idea based on the application of the laws of nature (*Naturgesetze*).

*Sec. 3 Rules of Universities*

Within the scope of these provisions and in order to account for the individualities of each scientific field or laboratory, each university, department or laboratory shall enact guidelines on how to handle inventions of its employees.

*Sec. 4 Assignments*

- (1) As for the patent rights obtained by employees, the inventor must be ready to assign his right of the invention to the institution (the country, regional organisation or university) in one of the following cases:
  - a) In case of an applied invention made within a specific scientific project supported by extraordinary funds of the institution;

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47 NAKAYAMA (ed.), *Tokkyo-hô* [Patent Law] (2nd ed. 1989) Vol. 1, 294/295 (Art. 35 III 3 b). It is interesting to note that the above explanations are missing in the commentary’s third edition of 2000.

48 *Daigaku kyoin no hatsumei ni kakaru tokkyo-tô no toriatsuka* (March 1978).

- b) In case of an applied invention that is the result of the institution's setting up special research facilities for a specific scientific purpose.
- (2) In case an invention referred to in the foregoing paragraph has been made, the inventor shall assign his rights to the patent according to Art. 5 para. 4 following a decision of the Dean of the University.
  - (3) An inventor who makes an invention outside the scope of para. 1 may transfer his rights to the institution.
  - (4) In the case of outside funding, the question of assignment of future rights shall be covered by the contract on which the funding is based.
  - (5) In case the institution wishes to acquire a right under para. 1, it shall make a separate decision on how to remunerate the inventor.

#### *Sec. 5 University Management*

- (1) The employee who has made an invention shall immediately notify the Dean of the University of the scope and the purpose of the invention including an opinion if the invention falls within the scope of Art. 4 para. 1 above. The Dean of the University shall upon the receipt of such notice make the necessary applications for registration.
- (2) In case the employee has notified an invention, its registration shall not be obstructed. If the invention's rights have been read to the institution, its legal management shall be conducted in accordance with the Invention Association (*Hatsumeï Inkai*).
- (3) The Invention Association shall see to it that the university is managing the invention properly and/or that the rights of the invention belonging to the employee are properly attributed to him.
- (4) The Dean of the University shall upon deliberation of the Invention Association determine if the institution shall execute the rights to an invention acquired under Art. 4 para 1 or otherwise assigned to the institution.

#### *Sec. 6 Centralised System*

- (1) For the centralised and proper management and enforcement of an employee's invention, the speedy conclusion of the application process, convenience and precision, a centralised system shall be set up.
- (2) The system shall clarify the following responsibilities of the universities when handling inventions:
  - a) Matters concerning the registration;
  - b) Management and enforcement of the patent right;
  - c) Collection and payment of royalties, promotion fees and other monies;
  - d) Gathering of information on patents and inventions.
- (3) In order to properly work the patents, a body shall be established for this purpose.

*Sec. 7 Others*

- (1) Those persons concerned with the management of employees' inventions shall be obliged to keep the contents as well as other facts related to the invention secret.
- (2) This basic plan shall equally apply to utility models.
- (3) This basic plan shall equally apply to technical scientists employed in research activities.
- (4) Universities that have already set up a system for managing employees' inventions may continue on the basis of the old system.

*4. Act on the Promotion of University Inventions by Private Enterprises<sup>49</sup>*

Sec. 1 – Purpose of this Act is to promote the technology developed by universities, private schools, jointly used facilities and public research institutes by private enterprises, and to contribute to the development of the new branches of the economy, the improvement of industrial technology, the individual welfare and the stimulation of research.

Sec. 2 – The technology transfer centres for certain university technologies (in the following: technology transfer centres) to be set up according to this Act transfer or licence patent rights or other rights defined by governmental decree that are the result of university inventions to private enterprises that appear suitable to appropriate use of these inventions. The transfer is meant to contribute to the development of research at the respective university. Universities are those defined under Sec. 1 of the Act on School Education, jointly used research institutes are those as defined under Sec. 9bis (1) of the Act on Specialised Schools and State Universities.

Sec. 3 – The Ministries of Culture and Trade will compile and publish working guidelines for technology transfer centres (in the following “working guidelines”) in cooperation with the responsible agencies, in order to promote the effective use of university inventions by private enterprises.

Sec. 4 – Anyone intending to set up a technology transfer centre (also in the form of a legal person) has to submit a “plan for the set-up of a technology transfer centre” (hereinafter “plan”) that has to be approved by the Ministry of Culture or the Ministry of Trade.

Sec. 5 – The Ministries of either Culture or Trade approve the plan if it apparently complies with the working regulations and the implementation looks likely.

Sec. 6 – An amendment of the plan is possible.

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<sup>49</sup> *Daigaku-tô gijutsu iten sokushin-hô*, Law No. 52/1998, in force since 1 August 1998.



Sec. 7 – Apart from those means of promotion mentioned under the Act of Temporary measures (*rinji sochi-hô*), promotion money for industry shall be used for the following means of promoting the use of university technologies by private enterprises:

- (1) Financial guarantees in cases where the technology transfer centre would like to obtain a loan or issue bonds in order to raise capital;
- (2) Subsidies for the operation of the technology transfer centre;
- (3) Information will be gathered, categorised and offers made for the use of certain inventions by private enterprises.

Sec. 8 – Apart from those activities specified in Sec. 5(1) of the Act on Small and Medium Sized Share Companies for the Promotion of Investment (*Chûshô kigyô tôshi ikusei kabushiki kaisha-hô*<sup>50</sup>) the investment companies mentioned therein may carry out the following activities:

- (1) Obtain or own shares issued by technology transfer centres to the extent that the latter has been set up as a share company with a basic capital of not more than 100 million Yen and was set up by a small or medium size enterprise or a natural person.
- (2) Obtain or own new shares, debitory notes or promissory notes with preferential rights to obtain new shares, issued by a technology transfer centre, founded as a small or medium sized enterprise with a basic capital of more than 100 million Yen, if the issue of shares, etc., was necessary to raise capital for the administration or transfer of research results.

Sec. 9 – In order to promote the use of certain research results by private enterprises, the Ministry of Culture shall examine if the research for the application of such technology shall be promoted at the university level.

Sec. 10 – In order to promote the use of certain research results by private enterprises, the Ministries of Culture and Trade will foster the cooperation in the fields of research and development between universities and private enterprises, taking account of the special conditions of technology research at the respective universities.

Sec. 11 – By taking appropriate measures, the Ministries of Culture and Trade will make sure that private enterprises are able to obtain the know how necessary for the application of research results.

Sec. 12 – Taking account of the important role of small and medium sized enterprises for the application of research results, the Ministry of Trade will publish information about research and development and the application of certain research results, or take other appropriate measures.

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50 Law No. 101/1963, last amended by Law No. 91/2000.

Sec. 13 – If a patent right or right over a patent application owned by a public university or a public research institute is transferred or an exclusive licence granted, Sec. 107(2) Patent Act (waiver of fees) is applied to the technology transfer centre obtaining such right.

Sec. 14 – [penal provisions]

Sec. 15 – [transitory provisions]

## 5. *List of Literature*

### General:

- Y. INOUE, *Kokuritsu daigaku de no hatsumei no toriatsukai* [On the Treatment of Inventions by Public Universities]: Tokkyo Kenkyû 20 (1995) 29.
- R. KNELLER, Ownership Rights to University Inventions in Japan and China, in: Streamlining International Intellectual Property, CASRIP Publications Series 5, (Seattle 2000) 160; available at <<http://www.law.washington.edu/CASRIP>>.
- H. MATSUBAYASHI, University Technology Transfer in Japan, CASRIP Newsletter (Winter 1998) 22; available at <<http://www.law.washington.edu/CASRIP>>.
- Y. SOMENO, *Gakujutsu kenkyû ni taisuru shokumu hatsumei kijun to sono kihonteki seikaku* [Standard and Policies of Employees' Inventions Within Universities]: Nihon Kôgyô Hoyûken Hôgakukai Nenpô 4 (1981) 125.
- K. TAMAI, The University Office of Technology Transfer: Japan in: Streamlining International Intellectual Property, CASRIP Publications Series 5 (Seattle 2000) 113; available at <<http://www.law.washington.edu/CASRIP>>.

### Japanese Research Policy:

- HEMMERT/OBERLÄNDER, *Technology and Innovation in Japan* (London 1998).
- KRONSCHACHNER, *Strategien japanischer Unternehmen*, (Stuttgart 1996).
- I. WIECZOREK, *Forschung und Entwicklung in Japan: JAPAN aktuell*, December 2000, 549.

## 6. *Proceedings of a seminar on "Inventions by Researchers" held in 1981.*

In 1981, a seminar was held on "Inventions by Researchers" centering on the problem of patent management of universities' employees' inventions. The contributions to this seminar were published in the Annual of Industrial Property Law [*Nihon Kôgyô Shoyûken-hô Gakkai Nenpô*] 1981, 123-196 (all contributions in Japanese).

- Y. SOMENO, *Gakujutsu kenkyû ni taisuru shokumu hatsumei kijun to sono kihonteki seikaku* [Standard and Policies of Employees' Inventions Within Universities] 125–145, highlights the history of Art. 35 Patent Law as well as the debates leading to the publication of the "basic plan". He also mentions inventions by other civil servants in ministries etc.

- J. EGUCHI, A Comparative Table of University Regulations for Management of Inventions by National College Professors in Japan, 146-156, highlights the differences in the implementation of the “basic plan” by different universities:
  - In some cases, designs are also covered by the guidelines;
  - In some cases, the duty to notify the employer is confined to inventions in the course of employment, or the period within which the right has to be assigned is specified as “60 days” or “30 days”.
  - Most universities have set up an Invention Association of their own.
  - Apparently only one university is interested if the invention is actually commercially workable.
- R. SENGEN, *Tokkyo-hô ni okeru jigyôsha hatsumei kitei ni tsuite no kihon mondai* [Some Substantial Problems of Employees’ Inventions] 157–170, compares the different legal systems of Europe, especially Germany, and the US with the law in Japan. With regard to Japan, he comments on some problems of Art. 35 Patent Law, especially the meaning of “within his duties”.
- Z. KITAGAWA, The Rules of the Kyoto University concerning Employees’ Inventions, 171-182, comments on the guidelines of his own university that were enacted in October 1979. The guidelines are within the framework of the “basic rules” and basically state the following:
  - The University of Kyoto has established an Invention Association whose members consist of professors of natural and technical sciences. Its members shall be elected for two years and may be re-elected. The Association shall be responsible for handling the patent application, and, where appropriate, the assignment of the patent rights to the state.

7. *On the proposals towards improving the commercialisation of university inventions:*

The periodical Tokugikon (No. 198, 1998) published a number of articles on how the commercial use of university inventions could be improved. These were:

- K. HAYASHI, *Tokkyô ni kakaru atarashii gijutsu iten systemu no kôsaku wo mezashite* [Measures for a New System of Technology Transfer] 1.
- Y. NISHINO, *Kigyôsoku kara mita daigaku no kenkyû to tokkyô* [Patenting of University Inventions from the Viewpoint of Industry] 9.
- S. KIKUCHI, *Daigaku gijutsu no sangyôkai he no iten ni okeru kentô no shiten* [Transfer of University Technologies to Private Enterprises] 47.

### 8. *Introduction to the new technology transfer centres*

The technology transfer centres established by the year 2000 were introduced in a special issue of the periodical *Tokugikon* (No. 211 of May 2000). The issue contains the following articles (all in Japanese):

- K. SHIMIZU, *TLO – Daigaku no arata na infurasutorakuchâ* [The New Infrastructure of Technology Transfer Centres] 4.
- M. SHOBAYASHI, *Gijutsu iten kikai CASTI no gendai to mondaiten* [The Technology Transfer Centre Casti] 12.
- A. YAMADA, *Chiiki ni nezashita TLO wo mokushi shite* [The perspective of regional Technology Transfer Centres] 16.
- K. SHIGENOBU, *Tôhoku no yume wo nosate funadashita TLO* [The New Tohoku Technology Transfer Centre] 20.
- Y. YOSHIDA, *Nihon Daigaku no gakuin sôshiki toshite umareta TLO* [The Technology Transfer Centre at the Nihon University] 24.
- K. OKAMURA, *Waseda Daigaku ni okeru TLO katsudô* [Technology Licensing at the Waseda University] 28.
- K. UEHARA, *Tsukuba Riazonu Kenkyûshô no shôkai* [The Tsukuba Liaison Institute] 32.
- M. IWAGAKI, *TLO koto hajime – Tôkôdai no toritsutsume* [Technology Transfer at the Tokyo Technical University] 36.
- H. MURATA, *Yamaguchi Daigaku no sankangaku renkei katsudô* [Technology Transfer at the Yamaguchi University] 40.
- N. SASAKI, *Sangaku renkei sane wo to shite kenkyû kaihatsu taisei no kiban sôri* [R & D Infrastructure at the Hokkaidô University] 44.
- K. KUMAGAI, *Kyûshû chiku ni okeru TLO setsuritsu jôken to gengo no kadai* [Technology Transfer in the Kyûshû Area] 48.
- T. YAMAMOTO, *Sangyôkai kara mita sangaku renkei ni yoru gijutsu iten no igi* [Technology Transfer Centres from the Point of View of Industry] 51.

All articles offer a brief overview of the structure and aims of the respective technology transfer centres. As most have been founded very recently, there is very little reporting on practical experience.

## ZUSAMMENFASSUNG

*Angesichts sinkender Studentenzahlen und knapper werdender öffentlicher Mittel für Universitäten wird für diese die gewerbliche Verwertung universitärer Erfindungen immer wichtiger. Besonders erfolgreich war man damit in der Vergangenheit allerdings nicht: Japan gibt etwa 3,6 % seines BSP für Forschung und Entwicklung aus und beschäftigt in diesem Bereich knapp eine Million Personen. Dabei werden jährlich etwa 350.000 Patente angemeldet, die wenigsten allerdings aus dem universitären Sektor: weniger als 150. In den Vereinigten Staaten sind es mehr als 5.000, die den Universitäten Lizenzeinnahmen von mehr als 500 Millionen Euro bescheren. Grund für die geringe Forschungsausbeute japanischer Universitäten sind vielerlei Faktoren, unter anderem: universitäres Desinteresse an der Verwertung, Unklarheiten im Hinblick auf das Eigentum an universitären Erfindungen, Absprachen der forschenden Professoren mit privaten Geldgebern.*

*Vor dem Hintergrund des als äußerst erfolgreich eingestuften US-amerikanischen Bayh-Dole Act hat das japanische Parlament 1998 ein Gesetz zur Förderung universitärer Erfindungen erlassen, das staatliche Beihilfen für die Gründung und Unterhaltung universitärer Technologietransferstellen vorsieht. Ganz in japanischer Tradition steht dabei auch die leihweise Entsendung erfahrener Beamter des Patentamtes an diese Stellen, um einen besseren Informations- und Erfahrungsaustausch zu gewährleisten.*

*Den mehr als zehn bisher eingerichteten Transferstellen an verschiedenen Universitäten liegt keine einheitliche Strategie zugrunde: Manche verbreiten Informationen über universitäre Forschungsergebnisse an zahlende Mitglieder aus der Industrie, andere bevorzugen ein offenes Informationssystem, um möglichst viele Industrieunternehmen ansprechen zu können.*

*Erforderlich ist sicherlich noch mehr: Bewußtseinsbildung bei den universitären Forschern, Einrichtung von Technologiebörsen, erleichterter Zugang zu Risikokapital zur Aus- und Neugründung von Unternehmen, Klarstellungen im Bereich der patentrechtlichen Neuheitsschonfrist.*