

Funded by a grant from the Scientific Research Program (Creative),
the Japan Society for the Promotion of Science

READ -F- 09-11

Disability and Economy in Japan

Akihiko MATSUI
Faculty of Economics, The University of Tokyo

First Version: April 2009

READ Discussion Papers can be downloaded without charge from
<http://www.read-tu.jp>

Discussion Papers are a series of manuscripts in their draft form. They are not intended for circulation or distribution except as indicated by the author. For that reason Discussion Papers may not be reproduced or distributed without the written consent of the author.

Disability and economy in Japan

Akihiko Matsui

University of Tokyo, Japan

This paper shows that, at least in Japan, the perception of homogeneity affects people's attitudes toward disabled people, inducing prejudices and stigma, and that these attitudes are not only real, but are also related to economic variables. Through this work, we argued that disability studies can provide economics and game theory--that have developed tools to study not only markets, but also customs and institutions as endogenous and integral parts of economies and societies--with new insights and can in turn make use of their methods in forming economic and social policies.

1. Introduction

Japanese society has been perceived as one consisting of a homogenous population by the Japanese themselves. This perception is not completely groundless. Although the *Ainu* have been recognized as a minority, they are far out-numbered by the majority of the population (only about 24,000 people, or 0.02% of the total population, have been identified as *Ainu* people). Unlike many other developed countries, Japan does not accept a substantial number of immigrants (Migrant stocks: United Kingdom, 9.1% of the total population or 14th among 30 OECD countries; Japan, 1.6% or 28th: United Nations' data on migrant stock in 2006--the mid-year estimate of the number of people who are born outside the country plus refugees who are not foreign-born). Still, there are certainly groups of people in Japan who are not regarded as 'ordinary' Japanese. Six and a half million disabled people, or 5% of the total population, constitute the most significant among such groups, though this number itself is much lower than the corresponding numbers in other developed countries (LSHPD [Long-Standing Health Problem or Disability], aged 16 to 64: Finland, 32.2%; United Kingdom, 27.2%. People registered as disabled, aged 18 to 64: Japan, 3.6%. Japan makes a strict distinction between disabled people from those who suffer from long-standing health problems).

As a matter of course, the various systems that make up society, including the height of each step of a flight of stairs, and the tax and social security systems, are designed to meet the needs of 'ordinary' people. As a result, those who are not 'ordinary' have difficulties in living with these systems. This is true not only in Japan but also in the United Kingdom and many other countries. Since, however, the Japanese perceive their country as consisting of a homogeneous group of people, there is a possibility that Japan disables some people more than other developed countries do. Indeed, some of these people are considered exceptional and are classified into groups like homeless people, single mothers, disabled people, and so on. Their basic needs are determined by the government, each individual need is labelled a 'luxury', and they are obliged to lead their lives as a social burden.

The purpose of the present paper is twofold. First, it shows that, at least in Japan, the perception of homogeneity affects people's attitudes toward disabled people, inducing

prejudices and stigma, and that these attitudes are not only real but are also related to economic variables.

The second purpose is related to the scope of our entire research project--rather than that of the present paper *per se*--which is to develop a new field of study on barriers in socio-economic contexts through the interaction between disability studies and economics. Disability studies as a discipline is said to have begun in the United Kingdom in the 1970s as an interdisciplinary field of research, to which political science, history, and sociology have contributed. These differentiate socially constructed disabilities from physical impairments and focus on the former.

In spite of its rich contents, disability studies has not adequately reached economists and has not satisfactorily influenced economic policies. This is unfortunate, since economics and game theory, in particular, have developed tools to study not only markets but also customs and institutions as endogenous and integral parts of economies and societies. Disability studies can thus provide economics and game theory with new insights, and can in turn make use of their methods in forming economic and social policies.

The remainder of this paper is organized as follows. Section 2 introduces two key related concepts in economics, complementarity and externality. In the presence of complementarity and network externality in an economy, Adam Smith's invisible hand may not work, and the economy may be trapped in a poor equilibrium, i.e., a stable situation. Section 3 presents a formal theory of inductive game theory, which gives rise to social perceptions that do not necessarily reflect the underlying structure of the society. Section 4 shows that such perceptions are not only real, but are also related to economic variables such as income. Section 5 argues that such perceptions may affect a welfare regime. Section 6 concludes the paper.

2. Complementarity and network externality

This section introduces two key related concepts in economics, complementarity and network externality. Network externality can be explained by using a public transport system as an example, say, an underground railway system. If only one station, say, *A*, is accessible by wheelchairs, the system is useless for people using wheelchairs since the purpose of using the underground is to go to another station. Therefore, we need at least two stations to be accessible by wheelchairs. But again, unless one uses these two particular stations, say, *A* and *B*, the system is still useless. Only one pattern of movement, going between *A* and *B* can be accommodated. What happens if three stations, *A*, *B* and *C* become accessible? There are now three patterns that can be accommodated. In general, if *n* stations become accessible by wheelchairs, $n(n-1)/2$ patterns of movements are accommodated. In other words, the accessibility of the underground increases at a faster rate than the number of stations with wheelchair access.

One may correctly point out that the accessibility of underground railways is not enough for those who wish to move around by themselves. We need more, of course. We need accessibility for buildings, streets, buses, and so on. Some economists call such a situation institutional complementarity (Aoki, 2001).

Another notable example can be found in the New York (NY) subway system. In the 1980s, it was considered dangerous to travel on the NY subway. Robberies were common, and the train cars were covered with graffiti. In the late 80s and early 90s,

there was a dramatic change. In order to make the subway safe, NYC increased the number of policemen on board the trains. It also changed the materials used for train car bodies to make it easy to erase graffiti. As a result, the NY subway became a fairly safe means of transportation.

To see the relationship between the number of robberies and the number of policemen, consider the following illustrative model. Some people commit robbery if the rate of arrest is sufficiently low. Different (potential) robbers have different thresholds. Suppose, for the sake of illustration, that their thresholds are distributed uniformly over the interval of 0 and 1 where one means ‘certain arrest’, while zero means ‘no fear of arrest’. If the rate of arrest is x , which is a number between 0 and 1, then the $1-x$ fraction of potential robbers will be better off when committing theft, while the x fraction would do better to desist. Therefore, the number of thieves is endogenously determined as a function of the arrest rate. However, this number x itself is in turn determined by the number of robbers. Suppose that x is determined by the number m (>0) of policemen as well as the number n of actual robberies. To simplify the calculation, let $x=m/n$. If n is greater than $1-x$, then n gradually decreases, while if n is less than $1-x$, n gradually increases over time:

$$dn/dt = a(1-x-n) = a(1-m/n-n), a>0.$$

In this dynamic, there are potentially two stable rest points, or equilibria, $n=0$ and $n=n^*=[1+(1-4m)^{1/2}]/2$, where the latter appears if $1-4m>0$ or $m<1/4$ (note: an equilibrium is an outcome from which nobody has an incentive to deviate). There is also an unstable equilibrium, $n=\underline{n}=[1-(1-4m)^{1/2}]/2$, if, again, the condition $m<1/4$ holds. This number \underline{n} serves as a threshold. If n is less than \underline{n} , then it pays not to commit robbery and vice versa. Therefore, if we stand back and do nothing while n increases beyond the threshold, the system then moves toward n^* , a bad equilibrium.

The implication is significant. Unlike simple externality, which can be corrected through, say, Pigouvian taxation, the network externality and complementarity pose an immense challenge to a market economy: Adam Smith’s invisible hand does not necessarily work. Examples other than the above anecdotes are abundant. The financial crisis is one of the latest and severest examples. If many investors want to take their money out of an investment bank, then people rush into this conduct since the swifter one moves, the higher is the chance of securing one’s investment money. This leads to a so-called bank run. What happened last year was this fear of a bank run in non-commercial-bank financial institutions, which were not regulated as stringently as commercial banks. This ‘bank run’ corresponds to one equilibrium, while ‘no bank run’ corresponds to another. What the governments and central banks have been trying to do is to avoid the bank run equilibrium by injecting trillions of dollars into financial sectors.

As is mentioned already, in the realm of disability, a similar phenomenon can be seen in terms of accessibility. If all disabled people stay in their domicile and do not go outside, then there is no need to accommodate them, and therefore, no action is taken, say, by the government. Thus, we need a critical mass to obtain a different equilibrium where the needs of disabled people are properly accommodated.

As we have seen above, complementarity often creates multiple equilibria, some of which are better than others. This multiplicity sometimes gives rise to unnecessary but persistent discrimination, to which we now turn.

3. The emergence of prejudice from discrimination

Kaneko and Matsui (1999) studied what they called the festival game, which has two stages. In the first stage of this game, a population, which is divided into two ethnic groups, *A* and *B*, simultaneously choose a location, 1 or 2, to visit. Let group *A* be the majority and group *B* the minority. In the second stage, upon observing the ethnic composition of the participants at one's own location, each person decides whether he/she will play in a friendly or an unfriendly manner. If a person takes unfriendly action, then his/her level of satisfaction (payoff, henceforth) is at the default level of zero. On the other hand, if the person takes friendly action, then--since this is a 'festival'--his/her payoff depends upon the number of friendly people in the same location. The greater the number of friendly people, the higher the payoff to the person who takes friendly action. In other words, the festival game exhibits complementarity. If no other people take friendly action, the payoff from taking friendly action is less than that from taking unfriendly action. Here, we assume that even the smaller ethnic group is so large that the group by itself can reach a critical mass beyond which people taking friendly action receive a positive payoff. In order to obtain a clear result, it is assumed that their payoffs do not depend, among other things, upon the demographic composition.

Kaneko and Matsui decomposed the analysis of this game into two parts, the standard equilibrium analysis and a new analysis, called inductive game theory. First, the simplest equilibrium is the one in which everyone goes to the same location and takes friendly action. This is a unification equilibrium. Another simple equilibrium is the one in which people choose a location randomly, and wherever they may go, they take unfriendly action. These are equilibria since people would like to take friendly action if many others do, and vice versa.

Yet, there is another equilibrium, which may be called a segregation equilibrium. In this equilibrium, the two groups of people go to different locations: group *A* people go to, say, location 1, while group *B* people go to location 2. They take friendly action as long as they observe only people from their own ethnic group. In order for this situation to be an equilibrium, each individual in group *B* must have no incentive to deviate to location 1, which is physically more attractive than location 2 since more people gather there and a higher payoff is obtained there than at location 2. This is made possible if group *A* people discriminate against group *B* people. Technically, this can be done if when group *A* people see a group *B* person they suddenly take unfriendly action. This way, segregation is maintained through discrimination.

Kaneko and Matsui continued on to the development of inductive game theory. In this theory, people try to 'explain' their experiences by constructing a model. Suppose, for this purpose, that people do not know the actual structure of the game, or in particular, how their payoffs are determined. Suppose further that they play the game according to the segregation equilibrium described above.

In this equilibrium, people who wish to 'explain' the discriminatory behaviour may come up with the following story. For some reason, group *A* people are happy in general, but they become unhappy from time to time. When one closely monitors what happens when their payoff drops, one may realize that a decrease in payoff is observed whenever there is a group *B* person in location 1. Thus, this group *A* observer may conclude that group *A* people become unhappy when a group *B* person joins them. This is a false model since the objective game says that what matters is the number of friendly people.

However, this prejudicial model may well explain one's experiences. Prejudices emerge.

Disability studies researchers may say they all know this, as the following quotation exemplifies:

There was the growing realization that the world we perceive is to a considerable extent shaped for us by the *way* we perceive it—that our consciousness of the world is a human construction rather than a merely mechanical reflection of external reality. Furthermore, this human construction of the world as perceived is different in different historical periods and different social groups, and ultimately is a systematic explanation of the way in which our perceptions are affected by the historical period and social position in which we are located. (Manning 1985, p.23)

Still, it is important to formally show that such prejudices are one of the outcomes of society, especially if one tries to fit this type of seemingly mental representation into the framework of a market economy.

(Note: Although I have no intention of offending or accusing British people, I would like to mention an example. There was a Japanese girl who went to an elementary school in Britain. Her name was Yuki, which is a common and beautiful name for Japanese girls. In English, however, it is spelt 'y-u-k-i', which other students associated with 'y-u-k' or 'yuk', so that she became the target of 'harassment', being called 'yuk!' by other children. I know how polite British people are, yet this type of 'harassment' may happen among children.)

4. Intellectual disability and stigma

It is in this way that stigma may be attached to disabled people. While stigma has been a key concept in sociology since Goffman (1963), it has never been a key concept in economics. One reason is that stigma is a mental attachment, and there has been little attempt to relate it to economic variables (note: Becker (1971) is an exception, but he assumed prejudice at the outset, while Kaneko and Matsui have endogenized it). This paper constructs a very simple model in which stigma and income act as arguments of the utility function of the decision maker, and compares it with other alternative models via regression analysis.

4.1. Facts

What this paper focuses on is the relationship between per capita prefectural income and the fraction of people registered as disabled. Table 1 shows this relationship. As shown in the table, there is a strong negative correlation between per capita prefectural income and the fraction of people registered as mildly intellectually disabled, while per capita income has no significant correlation with the fraction of people registered as severely intellectually disabled, or physically disabled. These relations do not change in various other tests using different explanatory variables. In short, the higher the per capita prefectural income becomes, the lower the fraction of people registered as mildly intellectually disabled. This observation gives rise to several competing hypotheses, which we may classify into two classes. The first is where the actual number of mildly intellectually disabled people affects the per capita income, and the second is where the number of registrations is affected by the per capita income.

Another notable fact is that a very rough benchmark for intellectual disability is an IQ of below 75. Even if we set the threshold at 70, around 2.2% of the population should

be intellectually disabled. However, even in the prefectures with higher numbers of registrations (Saga and Kagoshima), we observe that only 0.82% are registered (the lowest is Kanagawa, at 0.21%).

4.2. Competing hypotheses

This subsection considers several competing hypotheses that might explain the above facts. We divide the various hypotheses into two classes, based on whether the difference in the number of people registered as disabled reflects the actual number or not.

Hypothesis group 1. The actual number of disabled people and economic conditions

According to this hypothesis, economic conditions affect the distribution of intellectual level. There is some research that claims that children raised in a barren intellectual environment perform poorly on the standard IQ test. Among earlier works, Gordon (1923) conducted the Binet-Simon tests on different children to obtain several findings. For example, 76 children in England who live on canal boats and attend school only 5% of the requirement scored an IQ of 69.6. Moreover, the older they were, the lower were their IQ levels (the average IQ was 90 for children aged 4-6 years, while it was 60 for children aged 12-22 years). 82 Gipsy children scored 74.5 (their school attendance was 34.9%). In Japan, Hiroshima University (1965) and Takemura et al. (1965) conducted the Tanaka-Binet tests on 152 elementary school students. The average IQ was 87 (boys: 92, girls: 80).

If the rate of registration is higher for lower average IQs, then the suitable variables that explain this are measurements of intellectual level. There are some measurements of intellectual level that are available for all prefectures. One is the rate of higher education, and another is the average score in nation-wide examinations.

Table 1 shows that the percentage of high school students continuing on to colleges is significant at the 5% level, which shows the importance of the general educational level on the fraction of mildly intellectually disabled people. Still, notice that per capita prefectural income is significant at the 1% level.

Table 1.

	Fraction of severely intellectually disabled people (per 10,000)		Fraction of mildly intellectually disabled people (per 10,000)	
	Coefficient	t-value	Coefficient	t-value
Per capita prefectural income (in thousand yen)	-0.0033	-0.80	-0.013	-2.73 **
Fraction 65 and over (%)	1.05	2.43 *	1.36	2.65 *
Average no. people per household	0.80	0.18	15.17	2.92 **
Net social increase rate (%)	-6.57	-1.06	17.20	2.34 *
rate of continuation on to colleges (%)	-0.11	-0.63	-0.42	-2.07 *
Constant	13.09	0.78	18.73	0.94

R² = 0.54R² = 0.57

* Significance at the 1% level

** Significance at the 5% level

Hypothesis group 2. Number of people registered as disabled and economic conditions

As we have already seen, there is a wide discrepancy between the statistically estimated number of intellectually disabled people and the registered number. This fact itself suggests that there is a possibility that registration is affected by factors other than IQ. One can think of two major competing hypotheses. The first is that it is the local government that decides whether or not to accept the application based upon its own merit. The second hypothesis is that each applicant for registration chooses whether or not to apply for registration in order to maximize his/her payoff. If the former is the case, then the richer the local government, the higher the fraction of disabled people becomes, since the local government has enough 'pocket money' to distribute to the public. Note that the index of the strength of local governments in terms of fiscal budget is strongly correlated with per capita prefectural income. The first hypothesis is therefore rejected at the 1% level as the sign is reversed and significant.

The second hypothesis is based upon a very simple economic model involving stigma. Suppose that one's payoff is based, among other things, upon income and whether or not a stigma is attached. Let the payoff function u be of the form:

$$u(t, y, e) = t y^{ae},$$

where t is either one or a number s less than one, y is income, e is an idiosyncratic characteristic of the person in question, and a is a parameter less than one.

Suppose now that if one were registered as a person with an intellectual disability, a stigma is attached so that one's payoff decreases, while at the same time one can obtain certain monetary benefits such as tax reductions and discounts for public transportation. Then, for the same monetary benefit z , one has an incentive to register if, and only if

$$u(s, y+z, e) > u(1, y, e),$$

or

$$y < z/[s^{-1/(ae)} - 1].$$

Thus, the lower the person's income, the higher the likelihood that the person will register. If the standard deviation of income distribution is the same across prefectures, then the above formula is translated into a negative relationship between the rate of registration and per capita prefectural income.

Table 1 shows this relation. The coefficient for per capita prefectural income is -0.013 and is significant at the 1% level. This tendency does not change even if we remove or add other variables except for a local government budget index which induces multicollinearity with per capita prefectural income.

For the moment, let us ignore the significance interval and look at the magnitude of the effect of per capita income. The coefficient of -0.013 implies that as per capita income increases by one million yen, the number of registrations for mild intellectual disability decreases by 13 per 10,000. This is a significant number when the numbers of registrations for this class across prefectures vary from 11 (Kanagawa) to 50 (Okinawa) per 10,000.

This hypothesis is consistent not only with the fact that there is a strong negative correlation between the number of registrations and the per capita prefectural income, but also with the fact that this correlation is seen only for mildly intellectually disabled people and not for severely intellectually disabled people, who can be recognized irrespective of registration. Note that there is no significant correlation between the number of people registered as physically disabled, either. This may mean that there is little additional stigma attached to physically disabled people via registration.

As can be seen from Table 1, there are other significant factors for the number of people registered as mildly intellectually disabled. The coefficient of the average number of people per household is positive and significant at the 1% level. As the number of people per household increases by one, the registered number increases by 15 per 10,000. Roughly speaking, either the more children there are in a household, the more likely the household will tend towards registration, or a three-generation family will tend towards registration. One bold hypothesis is that if a family can compare one child with another child—either a sibling or a child of the grandparents, i.e., a parent when he/she was a child, then it is more likely to detect that the child in question is different from others than if they were not able to make the comparison.

An additional factor that may explain the decision to register is an employment quota for disabled people. Japan has an employment quota for disabled people: 1.8% for private firms, and 2.1% for many organizations in the public sector. The quota comes into effect when a firm has 56 or more employees. Moreover, if a firm has 300 or more employees, then it has to pay the government 50,000 yen or £400 per month for each person below the threshold (if a firm with more than 55 employees exceeds the threshold, it obtains a benefit from the government amounting to 25,000 yen or £200 per month for each extra person). On June 1, 2008, the rate of employment—the fraction of disabled people among the entire employees—was 1.59% (the actual rate is much smaller than this rate since there are exemptions, and a person with a severe disability is counted as two (double count)). Because organizations can count a worker only if the worker is registered as disabled, people have an additional incentive to register as disabled in order to make use of this system. (Note: a mother of a person

with a mild intellectual disability once told me that she decided to register her daughter as disabled in order for her to be able to work under this quota system). We cannot tell which is the cause and which is the effect. Still, one can see some relationship between the number of registrations and the actual employment rate of disabled people.

5. Discussion—Diversity and welfare capitalism

Various arguments have been made in the attempt to understand the properties and propensities of welfare capitalism: welfare capitalism refers to a type of regime in which a welfare state and a capitalist economic system coexist. Many such arguments have centred around the western world and/or have had ‘ordinary’ people in mind. To understand welfare capitalism, Esping-Andersen (1990) used the notion of ‘de-commodification’, which reminds some researchers of Marxian theory as this term is used as the ‘de-commodification of labour’. In Japan, Watanabe (2004) identified families, markets, and states as three providers of welfare and regarded Japan as a state similar to the Mediterranean states where familism and commodification are dominant. (Note: *Kaisha* or ‘companies’ constitute another important group that have provided people with welfare in Japan. See Matsui (2009) and references therein). This section proposes the degree of diversity as an additional factor for understanding welfare regimes, especially that of Japan, when it comes to the understanding of welfare capitalism for disabled people.

Esping-Andersen (1990) argued that a key factor in the measurement of welfare capitalism is the degree of de-commodification. According to his analysis, ‘De-commodification occurs when a service is rendered as a matter of right, and when a person can maintain a livelihood without reliance on the market’. (pp.21-22) Based on this observation, he identified three different welfare regimes: 1) liberal; 2) conservative; and 3) social democratic. The United Kingdom and the United States are classified as liberal, Germany and many continental European countries as conservative, and Scandinavian countries as social democratic.

In the liberal regime, ‘rights are not so much attached to work performance as to demonstrable need. Needs-tests and typically meagre benefits, however, serve to curtail the de-commodifying effect’. (ibid. p.22)

The conservative regime ‘espouses compulsory state social insurance with fairly strong entitlements. But again, this may not automatically secure substantial de-commodification, since this hinges very much on the fabric eligibility and benefit rules’. (ibid. p.22)

Among these three, he considered the social democratic regime as the most advanced of the three in terms of de-commodification. ‘It offers a basic, equal benefits to all, irrespective of prior earnings, contributions, or performance’. (ibid. p.23)

While Watanabe (2004) stated that the Japanese regime was classified as a conservative regime in Esping-Andersen’s context, Nakanishi (2008) claimed that the overall tendency of Japan is toward the liberal regime, especially after 1990. Although those who know the history of the period after 1990 may think that Japan is moving from a conservative regime to a liberal one through the lost decade and the subsequent era of structural reform, I do not hold this view.

What these studies miss is the factor of perceived homogeneity that characterizes Japanese society. In fact, Japan’s system is twofold and somewhat skewed. On one hand, Japan’s pension and medical systems are close to what the conservative regime

prescribes in the sense that everyone is supposed to join the national health insurance program, though in reality we are facing a serious problem of non-registration. On the other hand, the programs for people with 'special' needs, including disabled people, look more similar to those in the liberal regime than in the conservative regime. Japan's *seikatsu-hogo* or livelihood protection system is best understood as similar to that under the liberal regime, as is the registration system for disabled people.

This double-standard is well reflected in the statistics on public expenditures. The public social expenditures of Japan in 2007 was 18.6% of GDP while the OECD average was 20.5%, and the incapacity related expenditures of Japan in 2007 were only 0.7% when the OECD average amounts to 2.3%. Figure 1 plots these two numbers for various OECD countries. The point of this figure--in the present context--is that Japan is an outlier in the sense that incapacity related expenditures are disproportionately low when compared to total public social expenditures.

When some authors claimed that Japan was under a conservative regime, what they had in mind was the system for 'ordinary' Japanese as opposed to the 'non-ordinary'. This explains the discrepancy between Watanabe and Nakanishi, since Watanabe mainly focussed on the welfare system for 'ordinary' people, while Nakanishi focussed mainly on the programs for disabled people.

In a country with a small degree of diversity, policies are often formed without paying much attention to the 'non-ordinary' people, and if the country is an aspiring welfare state, then in order to compensate for this neglect, the government sometimes designs special programs that fit the needs of the 'non-ordinary' people without adequate consideration for smooth integration with the system for the majority.

This may well explain a recent failed attempt by the Japanese government to integrate the nursing care insurance and disability pension systems. Some associations of disabled people initially welcomed the idea of this integration. (Note: The Asahi Shimbun (08/06/2004) reported that '*Zen-nihon te-wo tsunagu ikuseikai* (*Ikuseikai* for short)', one of the most prominent associations of intellectually disabled people and their parents, having 320,000 members, agreed to the integration plan.) When it came to the point where the actual details of implementation became clear, they began to oppose the integration since it meant a curtailment of assistance for disabled people. (Note: The Asahi Shimbun (20/06/2005) reported that the chief of staff of *Ikuseikai* more or less opposed to the integration.) Although the orientation toward a seamless system was not a bad idea, which was the reason why some associations of disabled people welcomed it, the attempt was not particularly attractive under the current welfare regime of Japan since the main intention of the government was essentially to cut budget spending rather than to accommodate disabled people within the society.

6. Conclusion

This paper has shown that, at least in Japan, the perception of homogeneity affects people's awareness (or lack of awareness) of, and their attitudes towards, disabled people, which may lead to prejudices, and that the consequences of this are real and related to economic variables. We first introduced the key related concepts, complementarity and externality. The main lesson we should learn from the analysis of these phenomena is that Adam Smith's invisible hand does not necessarily work in the presence of complementarity and externality. We then presented the work of Kaneko and Matsui to see how complementarity may lead to discrimination and suboptimal

outcomes, and how discriminatory treatment may lead to prejudices and stigma. We pointed out that the number of people registered as intellectually disabled is far less than the number predicted by statistics and tested the hypothesis that people may refrain from registering--or having their children register--as intellectually disabled people because of prejudices or stigma against such people. We then discussed several factors of welfare capitalism and pointed out the lack of diversity as an additional factor for understanding the nature of disability-related problems in Japan.

Barnes et al. (1999) made the following remark in the introduction to their intriguing book: 'Exploring Disability has been written primarily for students of sociology and associated disciplines, including social policy, political science and cultural studies'. (p.8) I hope that their next book will be targeted at economists and game theorists, who are interested not only in markets but also in the customs and institutions of a society. If the reader feels the importance of disability studies and economics proceeding hand in hand, half of the goal of this paper will have been achieved.

Acknowledgement

This paper has been prepared as a keynote speech for the Todai Forum at Manchester Metropolitan University. On behalf of the entire membership of our research team, financial and other tangible support from Manchester Metropolitan University and the University of Tokyo are gratefully acknowledged. Financial support from the Scientific Research Program (Creative) of the Japan Society for the Promotion of Science (19GS0101) is gratefully acknowledged. Any opinions, findings, and conclusions or recommendations expressed in this material are those of the authors and do not necessarily reflect the views of the Japan Society for the Promotion of Science.

References

- Aoki, M. (2001) *Towards a comparative institutional analysis* (Boston, Massachusetts Institute of Technology).
- Barnes, C., Mercer, G., and Shakespeare, T (1999) *Exploring disability: a sociological introduction* (Cambridge, Polity Press).
- Becker, G. (1971) *The economics of discrimination* (Chicago, University of Chicago Press).
- Gordon, H. (1923) Mental and scholastic tests among retarded children: an enquiry into the effects of schooling on the various tests, *London: Board of Education Pamphlets*, 44, xx-xx.
- Esping-Andersen, G. (1990) *The three worlds of welfare capitalism* (Princeton, Princeton University Press).
- Goffman, E. (1963) *Stigma: notes on the management of spoiled identity* (New Jersey, Prentice Hall).
- Hiroshima Daigaku Kyoiku Seishin Eisei Kenkyu Group. (1965) *Teshima shogakko jido jittai chosa houkokusho* (Report on the condition of children at Teshima Elementary School).
- Kaneko, M. and Matsui A. (1999) Inductive game theory: discrimination and prejudices, *Journal of Public Economic Theory*, 1, 101-137.
- Manning, N. (Ed.). (1985) *Social problems and welfare ideology* (Aldershot: Gower).
- Matsui, A. *Koyo-fuanka no safety net* (The safety net under employment insecurity), *Nikkei Shimbun*, morning edition, 22 Feb. 2009.
- Nakanishi, S. (2008). Tojisha-shuken no Fukushi-senryaku (A welfare strategy for the sovereignty of the people concerned), *Kikan Fukushi Rodo*, 120, 57-66.
- Takemura, I., Sakagami, R., Nomura, S., Takano, T., and Hamana, A. (1965) *Hekichi(rito) jido-ni kansuru seishin igaku-teki kenkyu* (Psychiatric research concerning children in isolated areas (islands)), *Jido Seishin Igaku-to sono Kinsetsu Ryoiki*, 6, 133-145.
- Watanabe, M. (2004) Fukushi-shihonshugi-no kiki-to kazokushugi-no mirai (Welfare capitalism in crisis and the plight of familism), *Kikan Keizai Riron* (Political Economy Quarterly), 41(2), 3-14.

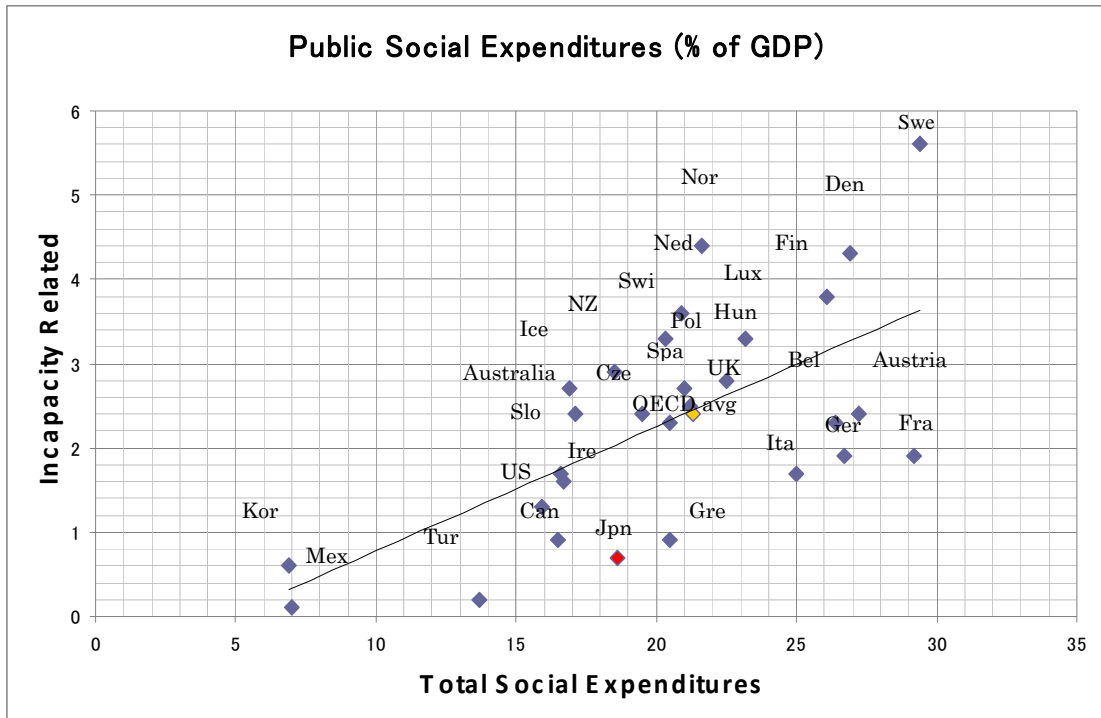


Figure 1. Public Social Expenditures (% of GDP, 2005)