

A Study on the Effect of Job Assistance Policy toward Social Exclusion using Agent-Based Simulation Model

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Abstract

The purpose of this study is to clarify the effect of education and the job assistance policy for youth on social exclusion, especially the relationship between rising university advancement rate, the extensive job assistance and the state of social exclusion. To achieve this purpose, we evolve our simulation model developed in 2015 without changing the model framework that social exclusion is transmitted to the next generation.

We can conclude that two policies have greater efficacy in improving social exclusion. However, the simulation model used in our study is a very simple agent-to-agent network model. It would be better if we could indicate in our model actual “path” of education, job assist and social inclusion.

Keywords: Agent Based Simulation, Social Exclusion, Poverty, Inequality, Job Assistance Policy

1. Introduction

In Japan today, it is pointed out that economic disparity has enlarged. It can be suggested that for one thing this is because expanding non-regular employment. At present, the rate of non-regular employees in Japan is 37.2%. Also, it is reported that there are many middle-aged who are confronted with a dire situation. Because of the recession at the beginning of their career, many of them had to choose unstable job or to become NEETs, in their youth. Consequently, they are likely to be at risk of extreme social exclusion.

In the field of social inclusion research, the importance of job assistance for youth is noted. Based on these facts that the size of non-regular employment has expanded and the importance of job assistance for youth is pointed out, we developed our original 2015 simulation model. In our 2015 model, based on social network and the situation of social exclusion is passed on to the next generations, it is represented that rising university advancement rate results in reducing the severity of social exclusion. However, some researchers pointed out that there is only a limited supply of good job. There might be competition with others for good jobs.

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2. Simulation Settings

In this model, social exclusion is transmitted to the next generation and three factors, which is “social participation”, “political rights” and “income” are connected to each other. For example, if an agent has a low income, he or she is restricted in many aspects of social participation and political right. Especially, we implement social network framework in our simulation model. In addition, social problem, for example, aging society is expressed by our simulation model. Basically, each agent gets along in years, earns income and dies a natural death. One step is defined as one month. In addition to this, they pass on their situation of social participation and political right to the next generation. The outline of our simulation model is shown in Figure 1.

As shown in Table 1, based on the simulation model as stated above, for the purpose of analyzing the relationship between the strength of social exclusion and educational policy, we make agents belong in different income groups. Also, the education continuance rate in different income groups calculated from statistics and report, e.g. Ministry of Education, Culture, Sports, Science and Technology (2009), is introduced into our simulation model. Furthermore, the rate of employment in full-time employee by educational background is also introduced into our simulation model. These extra elements are key factors connecting adequate education and social inclusion. Because, in Japan, although more companies are starting to adopt ability-based wage systems, most companies still have seniority-based wage system, in which full-time employees’ salary goes up as they grows older. In addition, there is a huge wage gap between full- and part-timers in Japan. We implement these mechanisms into our simulation model.

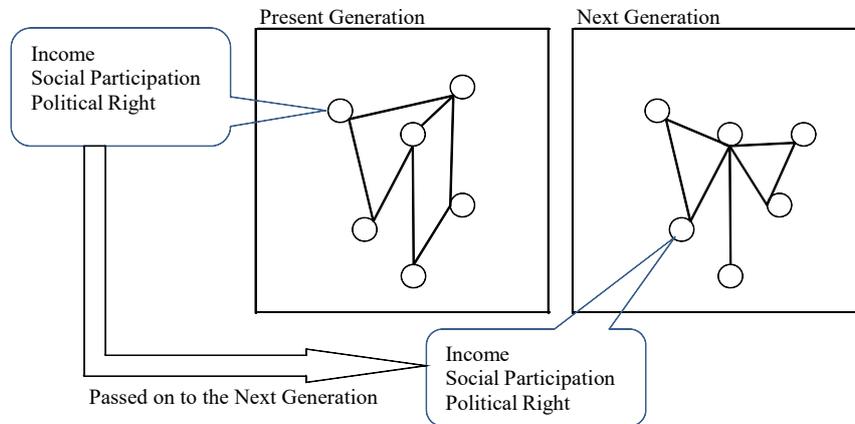


Figure 1 The Outline of our Simulation Model

Table 1 Actual Figures in Each Educational Strategies

Income Class (Ten Thousand Yen)	University Advancement Rate			
	Actual Condition (No Educational Strategy)	Strategy 1	Strategy 2	Strategy 3
Under 400	30%	40%	50%	55%
400-600	44%	54%	50%	55%
600-800	49%	59%	50%	55%
800-1000	59%	69%	59%	59%
Over 1000	62%	72%	62%	62%

Source: Ministry of Education, Culture, Sports, Science and Technology (2009), Figure1-1-14

In addition to these settings, we implement the interaction (competition) between socially excluded groups and another in job market. In Japan, the number of employees in large enterprises is 13.97 million and that in small and medium enterprises is 32.17 million (Small and Medium Enterprise Agency (2015)). And the rate of part-time worker is about 35-40 % in all size of enterprise (Employment Status Survey 2012). Also, wages depend on the size of the enterprise and employment status. We implement these mechanisms into our new simulation model. Hence, even high university advancement rate is accomplished in all income groups, it will not directly lead to improve the state of social exclusion.

3. Simulation Results

3.1. Overall Gap in Social Exclusion

The results are shown in Figure 2. The degree of social participation is expressed in the number of link that each agent have. And the degree of social participation is linked to the agent income. As shown in Figure 2, the higher the university advancement rate in low income groups (e.g. Strategy 3), the narrower the gap in the degree of social participation is. In addition, this improvement is less-dramatic, because increasing the rate of university advancement rate does not necessarily lead to have good job.

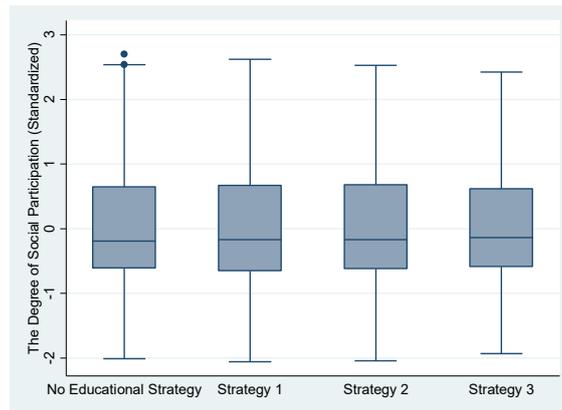


Figure 2 The Gap in the Degree of Social Participation by Educational Strategies

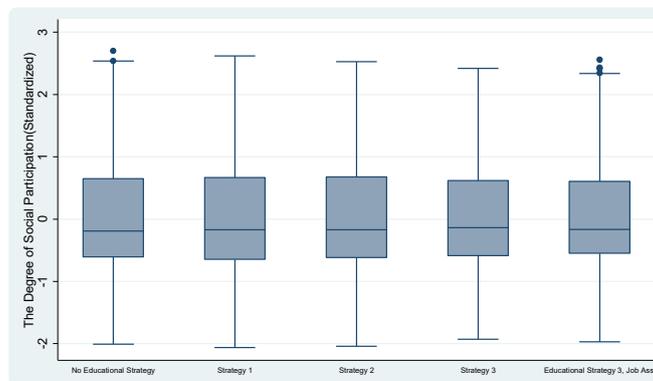


Figure 3 The Gap in the Degree of Social Participation by Educational Strategies and Job Assistance Policy

And now, we would like to implement the job assistance policy for youth in our simulation model. We implement various set-up patterns in our simulation model. In one instance, job assistance policy that conducts workers, who are under 34 years old and employed small and tiny enterprises, skill development (In Japan, the upper age limit in job assistance policy for youth is 34 years old). And we are concerned here only with the percentage of the policy achievement is 50 % under the educational strategy is Strategy 3.

Figure 3 shows the result of simulation. As shown in Figure 3, job assistance policy has significant effect on social exclusion in these cases. The interquartile range in the case that job assistance policy is introduced is 1.15, which is decreased by 0.06 from the case of Strategy 3. The gap in social participation is smaller than that in another Strategies (No educational, Strategy 1, Strategy 2, Strategy 3 < no job assistance policy >).

Of course, the effect of the job assistance policy varies depending on the efficiency of policy, fiscal condition, policy's coverage, government's position and the state of economy.

3.2. Track data on Some Agent's

Here, we would like to track the status of social participation on some agent's. For this purpose, we take up some cases, that is, "No educational strategy" and "Strategy 3 with job assistance policy". The status of social participation are carried on into next generation. Moreover, how educational policy and job assistance policy might affect the status of social participation in next generation? With these in mind, we would like to track the change pattern of social participation on some agent's. The results are shown in Table 2 (No educational strategy) and Table 3 (Strategy 3 with job assistance policy).

Table 2 and Table 3 are one of example about the change pattern of some agents' status for social participation. Also, we pick up some agent's ID, 501, 509, 511, 518, 520, 521, 533, 534 and 549. It is because the number of agent at simulation start is 500, these agents (ID is 501 and later) are affected to a large degree by educational strategy and job assistance policy.

Table 2 The Change Pattern of Some Agents' Social Participation (No Educational Strategy)

ID	114th Steps	171st Steps	228th Steps	285th Steps	342nd Steps	399th Steps	456th Steps	Spark Line Chart
501	-0.257396058	-0.2856501	-0.283377095	-0.236695641	-0.238371718	-0.175960889	-0.310531272	
509	0.333266665	1.085177967	1.143208886	1.241706954	1.20944167	1.443635526	1.436262441	
511	-1.170238448	-0.642636576	-0.493327485	-0.44535907	-0.366984583	-0.336660145	-0.346292404	
518	-0.676229625	-0.521261174	-0.417960678	-0.130144102	-0.032591135	0.050908647	0.107598876	
520	-0.69770827	-0.514121444	-0.434110708	-0.356566121	-0.286142211	-0.213772479	-0.181241029	
521	-0.031870291	0.328366639	0.642557957	0.655673493	0.768483278	0.933179068	1.111661404	
533	-1.492418116	-0.949644945	-0.719427905	-0.605186377	-0.547042593	-0.484755537	-0.423316378	
534	-0.98766997	-0.349907665	0.077306908	0.544682307	0.768483278	0.838650094	0.853080918	
549	-1.621289983	-0.2856501	0.007323444	0.260544872	0.683966252	0.772479813	0.798063793	

Table 3 The Change Pattern of some agents' Social Participation (Strategy 3 with Job Assistance Policy)

ID	114Steps	171Steps	228Steps	285Steps	342Steps	399Steps	456Steps	Spark Line Chart
501	0.851373299	1.011343719	1.16706002	1.214341867	1.300329555	1.459552912	1.311423759	
509	0.967009869	1.204559309	1.471439819	1.655195766	1.80382042	1.918705829	1.904457916	
511	0.525488421	1.791106636	1.863522272	1.710302503	1.673546559	1.906622857	1.854820695	
518	0.36780219	1.225260979	1.378578186	1.655195766	1.610170087	1.60454857	1.674559212	
520	-0.126281336	0.480000846	0.661480015	0.904896342	1.004572683	1.033628166	1.201699378	
521	-0.452166214	0.383393051	1.043244509	1.036304716	1.205264846	1.396117311	1.528260037	
533	-0.736001431	0.203978575	0.713069811	0.883701443	1.141888373	1.374972111	1.502135184	
534	-0.977786986	-0.161750935	0.243602664	0.718381231	0.94119621	1.245080167	1.656271815	
549	-1.398283603	-0.058242583	0.599572259	0.887940423	1.05034458	1.160499367	1.196474408	

To compare Table 2 and Table 3, many agents' status of social participation in Strategy 3 with job assistance policy is better improvement than that in the case of no educational strategy. Many agents' status for social participation in the case of no educational strategy remain with the status quo or tick up a bit. However, in Strategy 3 with job assistance policy, many agents' status for social participation are improved compared with the case of no educational strategy.

In the short term, the educational strategy and job assistance policy like Strategy 3 show a marginal improvement in the degree of social exclusion. However, in the long term, this situation produce considerable improvement in the degree of social exclusion, because the situation changed for the better is passed on to the next generation.

4. Conclusion and Future Works

In this paper, we examine the effect of education and job assistance policy on social exclusion, especially the relationship between rising university advancement rate, implementing job assistance policy and the change pattern in the state of social exclusion. From the above discussion, we can conclude that two policies have greater efficacy in improving social exclusion. In the long term, this situation produce considerable improvement in the degree of social exclusion, because the situation changed for the better is passed on to the next generation.

However, the simulation model used in our study is a very simple agent-to-agent network model. It would be better if we could indicate in our model actual "path" of education, job assist and social inclusion.

Our simulation was run with economic conditions held constant. Therefore, what remains to be done is to see the effect of the changes in economic conditions on social exclusion.

References:

- [1] Abe, A. (2007), “Measuring Social Exclusion in Japan”, *the Quarterly of Social Security Research*, Vol.43, No.1, pp.27-40.
- [2] Ministry of Education, Culture, Sports, Science and Technology(2009), *White Paper on Education, Culture, Sports, Science and Technology*, Ministry of Education, Culture, Sports, Science and Technology.(in Japanese)
- [3] Philo, C. (2000), “Social exclusion”, Johnston, R.J. (eds.), *The Dictionary of Human Geography*, 4th Edn, Oxford: Blackwell.
- [4] Small and Medium Enterprise Agency (2015), *Outline of the 2015 White Paper on Small and Medium Enterprises in Japan and the 2015 White Paper on Small Enterprises*, Small and Medium Enterprise Agency.
- [5] Statistics Bureau (2012), *Employment Status Survey*, Statistics Bureau.