

## 6. BS のキャリアアップ：青年期における正規化経験の有無に関する 2 者択一モデル分析

### 6.1 モデル

BS 組 (Bad Start) に関して、さらに BS-A (男性については 35 歳までに 1 年でも正規となった経歴がある人、女性については 23 歳までに 1 年でも正規となった経歴がある人) と BS-B (上記以外の人) に区分する。これらに対応する確率を、それぞれ  $P_{BS-A}$ 、 $P_{BS-B}$  とし、それぞれの確率がロジスティック分布に従っていると仮定する。その上で BS 組の正規化経験の有無に影響を与える独立変数を設定し、2 者択一モデル (ロジット・モデル) を用いて推計する。

被説明変数については、BS-A 組を 1、BS-B 組を 0 とした。

また、男 35 歳以前、女 23 歳以前における正規化経験の有無に影響を与える独立変数として、ここでは、中学校の頃に友人がいたダミー、初職の業種ダミー、初職の職種ダミー、初職の雇用形態ダミー、就職に際しての公的な職業訓練の経験の有無ダミー、勤続 2 年以上の経験ダミー、小学校入学前の母親の就業状況ダミー、勤務年数を考慮して、次のようなダミー変数および実数変数を作成した。相対的に有意度が低い変数は除外することにより、次のような推計結果を得た。

- 1) q88\_2 中学校の頃に友人がいた (基準：いなかった)  
友人がいた → 1
- 2) q11\_2fa\_6 初職の業種 (基準：製造業)  
非製造業であった → 1
- 3) q12\_1fa\_7 初職の職種 (基準：グレーカラー)  
ホワイトカラー → 1  
ブルーカラー → 1
- 4) q12\_3fa\_8 初職の雇用形態 (基準：1 年以上 5 年以下)  
期限の定めなし → 1  
1 か月以上 1 年未満 → 1
- 5) q12\_4fa ほか 就職に際しての公的な職業訓練の経験 (基準：1 回もなし)  
1 回以上あり → 1
- 6) q10\_1fa ほか 勤続 2 年以上の経験 (基準：1 回もなし)  
1 回以上あり → 1
- 7) q83\_23 小学校入学前の母親の就業状況 (基準：仕事をしていた)  
仕事をしていなかった → 1
- 8) 勤務年数 (初職以降、男性 35 歳、女性 23 歳までの勤務年数)  
勤務年数 → 実数

### 6.2 推計結果

#### 6.2.1 男性

キャリアアップの傾向を示す BS-A 確率に関して、初職の雇用形態において期限の定めがなかった場合、勤続 2 年以上が 1 回以上あった場合、35 歳までの勤務年数が長かった場合、中学校の

頃に友人がいた場合、BS-A 確率はそれぞれ高かった。一方、公的な職業訓練の経験があった場合や、小学校入学前に母親が仕事をしている場合（統計的な有意性は低いものの）、BS-A 確率はそれぞれ低かった。

図表 47 ロジット・モデルの推計結果（男性）

変 数	P <sub>BS-A</sub>	
定数項	-3.877	(-2.64)
世代ダミー		
1966.4-1971.3	0.761	(0.94)
1971.4-1976.3	0.00154	(0.0021)
1976.4-1981.10	-0.0413	(-0.06)
中学校の頃に友人がいたダミー	0.848	(1.83)
最初の就職が非製造業ダミー	0.937	(1.54)
初職の職業ダミー		
ホワイトカラー	1.150	(1.89)
ブルーカラー	-0.409	(-0.68)
初職の雇用形態ダミー		
期限の定めなし	2.933	(3.88)
1ヶ月以上1年未満	0.556	(0.69)
職業訓練1回以上ありダミー	-1.878	(-3.60)
勤続2年1回以上ありダミー	1.318	(2.16)
初職から35歳までの勤務年数	0.214	(2.88)
母は小学校入学前仕事せず	-0.381	(-1.00)
尤度比 (LR)	218.6	

注) サンプルは 398 人。

### 6.2.2 女性

女性の BS-A 確率に関する傾向は、基本的に男性のそれに同じであった。但し、最初の就職が非製造業の場合、最初の職業がブルーカラーの場合、BS-A 確率は高かった。さらに、1976 年 4 月～1981 年 10 月生まれ（30-34 歳）では、顕著に下方への世代効果が認められ、キャリアアップが進まなかったことが示唆される。

図表 48 ロジット・モデルの推計結果（女性）

変数	P	
定数項	-1.661 <sup>BS-A</sup>	(-2.56)
世代ダミー		
1966.4-1971.3	-0.020	(-0.06)
1971.4-1976.3	-0.490	(-1.51)
1976.4-1981.10	-0.791	(-2.49)
最初の就職が非製造業ダミー	-0.671	(-1.81)
初職の職業ダミー		
ホワイトカラー	-0.166	(-0.60)
ブルーカラー	-1.025	(-1.62)
初職の雇用形態ダミー		
期限の定めなし	1.798	(4.19)
1ヶ月以上1年未満	-0.261	(-0.40)
職業訓練1回以上ありダミー	-0.994	(-3.39)
勤続2年1回以上ありダミー	-0.414	(-1.25)
初職から23歳までの勤務年数	0.753	(6.53)
尤度比 (LR)	287.4	

注) サンプルは 615 人。

## 7. BF の確率推計

### 7.1 本稿における BF の定義

日本で老齢年金を受給するためには、年金制度に 25 年以上加入する必要がある。さらに、給与に比例する年金給付があるかないかで受給する年金の水準は大きく異なる。ちなみに厚生年金加入 25 年以上の人の年金受給見込み額（平均値）は、LOSEF インターネット調査（55 - 59 歳のサンプル）によると、男性月額 18 万円、女性月額 14 万円（いずれも個人ベース）であった。他方、同じ調査で厚生年金加入 25 年未満（55 - 59 歳の男女）の場合、男性月額 9 万 2,000 円、女性月額 8 万 2,000 円であった。

そこで本稿では、BF (Bad Finish) を 60 歳時点の厚生年金加入が 25 年未満の人と定義する。

### 7.2 BS グループにおける生年別 BF 確率のシミュレーション

上記に述べた BF の定義にしたがって、本項では男女の BS グループに着目し、BF 確率を生年別に推計したい（注 4）。とりあえず、以下のような簡便な方法を用いて推計した。

その推計手順は次のとおりである。まず、対象サンプルを 5 歳きざみに区分し、それぞれの就業状況別（TY、AT、その他、の 3 区分）のサンプル割合、平均年齢（ねんきん定期便の起算月における年齢）、厚生年金加入月数（平均）を求める。次に過去 5 年間における就業状況の変化に関する遷移確率を 5 歳きざみで算出する。その上で、過去 5 年間における厚生年金加入年数の増加分を、T → T の場合は 60 ヶ月、T → AT（または AT → T）の場合は 45 ヶ月、AT → AT の場合は 30 ヶ月、その他 → その他の場合は 0 ヶ月、等々と仮定して、厚生年金加入が 60 歳時点で 300 月（25 年）以上となる確率をシミュレーションした。

その結果は次のとおりである。

就業状態の変化に関する遷移確率については、男性では、T（正規就労）、AT（非正規就労）の区分が5年後にも継続する確率が高いが、T → AT、AT → Tといった遷移確率も20%前後となっており、両者間の移動も少なくないことがみてとれる（図表49）。一方、女性におけるT → Tという継続確率は相対的には高いものの、男性に比べると低い。また、AT → Tといった正規就労への遷移確率は10%以下に過ぎない（図表50）。

図表 49 男性 BS グループの就業状態の変化に関する遷移確率

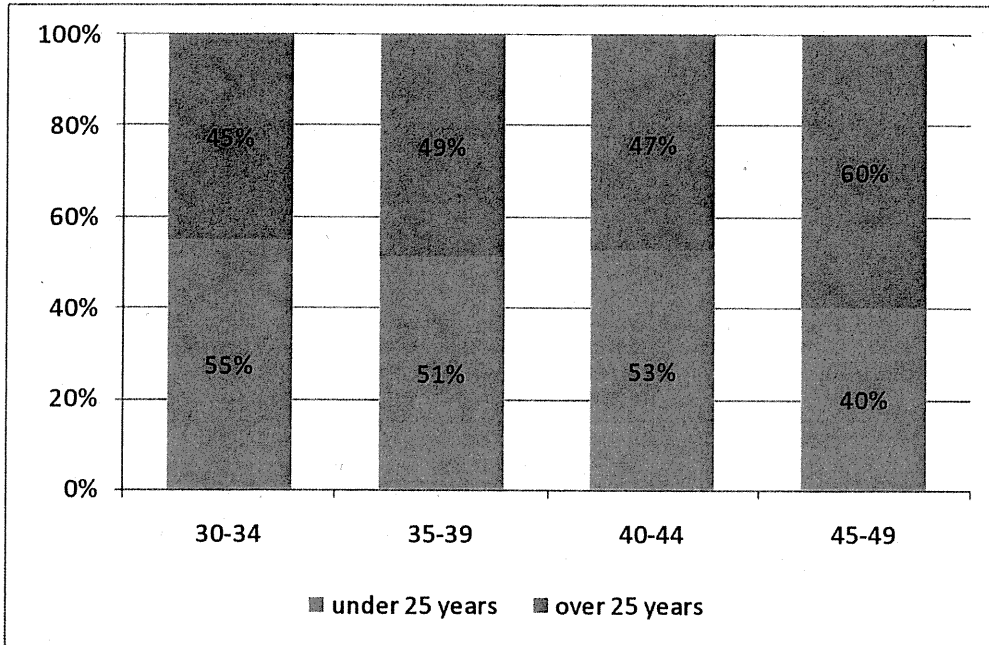
年令階層の移動		(30-34)	(35-39)	(40-44)	(45-49)	(50-54)
		-> (35-39)	-> (40-44)	-> (45-49)	-> (50-54)	-> (55-59)
遷移確率	T→T	89%	80%	67%	78%	93%
	T→AT	6%	12%	24%	19%	0%
	T→その他	5%	7%	9%	4%	7%
	小計	100%	100%	100%	100%	100%
	AT→T	18%	10%	20%	22%	22%
	AT→AT	77%	79%	75%	78%	72%
	AT→その他	5%	10%	5%	0%	6%
	小計	100%	100%	100%	100%	100%
	その他→T	13%	10%	0%	0%	0%
	その他→AT	6%	20%	0%	17%	7%
	その他→その他	81%	70%	100%	83%	93%
	小計	100%	100%	100%	100%	100%

図表 50 女性 BS グループの就業状態の変化に関する遷移確率

年令階層の移動		(30-34)	(35-39)	(40-44)	(45-49)	(50-54)
		-> (35-39)	-> (40-44)	-> (45-49)	-> (50-54)	-> (55-59)
遷移確率	T→T	53%	44%	71%	60%	60%
	T→AT	15%	32%	21%	7%	15%
	T→その他	32%	24%	8%	33%	25%
	小計	100%	100%	100%	100%	100%
	AT→T	7%	6%	2%	2%	4%
	AT→AT	71%	76%	78%	87%	86%
	AT→その他	22%	18%	20%	11%	10%
	小計	100%	100%	100%	100%	100%
	その他→T	2%	0%	2%	0%	0%
	その他→AT	2%	14%	17%	18%	5%
	その他→その他	97%	86%	81%	82%	95%
	小計	100%	100%	100%	100%	100%

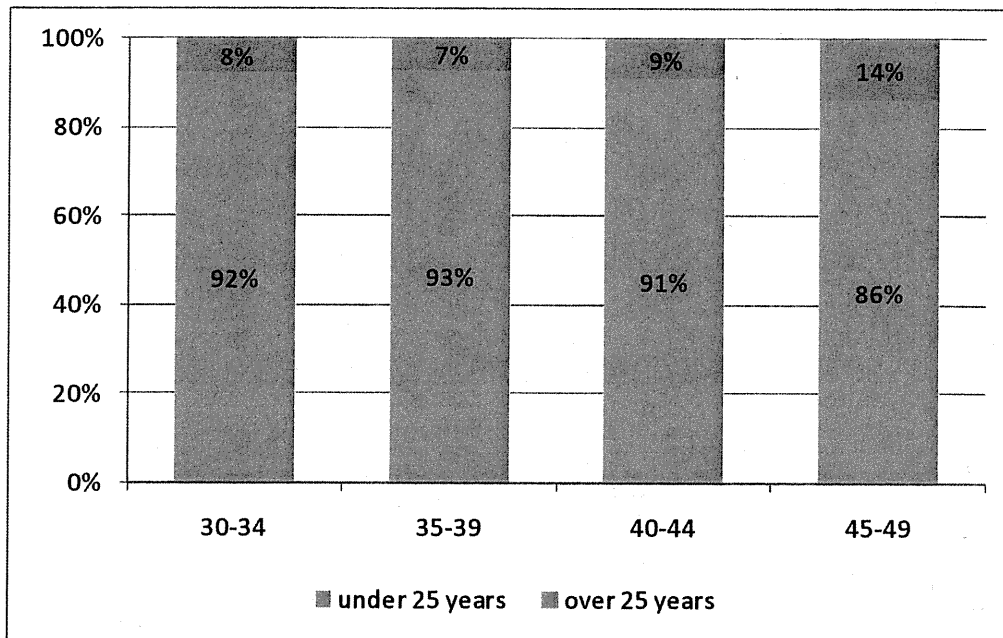
上述の遷移確率を用いて、2011年10月時点で30-34歳、35-39歳、40-44歳、45-49歳の各世代について、60歳時点におけるBF確率（厚生年金の加入年数が25年未満となる確率）を推計してみた。推計結果によると、BF確率は総じて世代が若くなるにつれて高くなる。そして、現在30-34歳世代のBF確率は男性で50%強、女性で90%強であった（図表51、図表52）。

図表 51 男性 BS グループの BF 確率



注) 加入年数 25 年未満が BF 確率を示す。

図表 52 女性 BS グループの BF 確率



(注)

1. 本調査はインターネット調査であり、ねんきん定期便の保持者に調査対象を限定している。そのため、サンプルには高学歴バイアスがある。詳細は稲垣 (2010) 参照。
2. 本稿では GS グループを最短卒業年プラス 1 年以内の入職者に限定している。
3. 経年的に高学歴化が進行してきたにもかかわらず、BS グループの割合が上昇してきた理由

は何か。それは、別途、究明する必要がある。

4. 女性の場合、どのような男性と結婚するかによって夫婦合計の年金額は著しく違う可能性がある。日本の女性は夫の財布（や夫名義の銀行キャッシュカード）も管理している人が、これまで多かった。つまり、個人ベースで推計されたBF 確率は、女性の場合、あまり意味を持たないおそれがある。ただ、最近の若い女性については共働きが多く、さらに、未婚率や離婚率も上昇しているので、個人ベースで試みたBF 確率のシミュレーションには、それなりの意味があるかもしれない。

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Why are people excluded from safety nets and how do they live without them?

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#### Abstract

In this study, we examine what socioeconomic factors are associated with non-participation in social insurance plans and how exclusion from safety nets affects people's well-being and health, on the basis of micro data collected from two social surveys in Japan. The key findings are summarized as follows: First, non-participation in social insurance plans is associated with several disadvantageous socioeconomic factors in childhood and later life. Second, the associations between non-participation and socioeconomic factors differ for public pension and health insurance plans. Third, non-participants in social insurance plans cannot afford to save much money in general and have no adequate preparation for old age. Fourth, those excluded from safety nets suffer unfavorable health conditions, especially in terms of mental health. These results underscore the importance of policy measures aimed at avoiding exclusion from safety nets.

## 1. Introduction

We need safety nets in order to protect us from a variety of social risks, such as diseases, unemployment, and inability to work in old. In recent years, however, an increasing number of people have been excluded from these safety nets. According to the Ministry of Health, Labour and Welfare, more than 40% of those who are supposed to pay National Pension Insurance premiums did not pay them in 2008. In addition, anecdotal evidences show cases in which parents reduce the visits of their children to the doctor because they are not covered by any health insurance plan since they are on low income.

In this study, we attempt to examine what socioeconomic factors are associated with non-participation in social insurance plans and how exclusion from safety nets affects people's well-being and health, on the basis of the micro data collected from two social surveys in Japan: the *National Survey on Social Security and People's Life* (NSSPL), conducted by the National Institute of Population and Social Security Research, and the *Comprehensive Survey of the Living Conditions of the People on Health and Welfare* (CSLCPHW), conducted by the Ministry of Health, Labor, and Welfare.

This paper is arranged as follows. In Section 2, we provide a brief description of the data used for the analysis and the basic attributes of the sample. In Section 3, we analyze the associations between non-participation in social insurance plans and socioeconomic factors. In Section 4, we investigate how people's well-being and health are related to non-participation in social insurance plans. Finally, in Section 5, we summarize the discussion and provide some policy implications.

## 2. Data

### 2-1. Surveys

Our empirical analysis in this paper is based on micro data collected from the NSSPL and CSLCPHW (questionnaires for households and health), both of which were conducted in 2007. The NSSPL covers household members aged 20 to 69 years. The NSSPL used samples



randomly taken from the samples used for the CSLCPHW conducted in the same year, making it possible to match the data between the two surveys.

The data of the NSSPL are divided into those of household questionnaires and those of individual ones: the number of household questionnaire samples is 10,766 (valid response rate: 68.2%) and that of individual questionnaires distributed to the heads and members of households, 17,188 (83.1%). In the current analysis, we collect health variables (subjective sense of health, psychological health index, etc.) from the CSLCPHW and the variables of socioeconomic factors and retrospective assessment of past living conditions from the NSSPL.

Our analysis in this paper is concentrated on individuals aged 25 to 59 years, because those 60 years and over do not need to pay NPI premiums and also because a significant portion of those aged below 25 are students.<sup>1</sup> The greatest attention is paid to whether the samples are protected by the existing safety nets. In the NSSPL, the samples were asked to choose the comment that describes their participation in public pension and health insurance plans from among “I participate,” “I participated [in the past but don’t at present],” and “I have never participated.” We define those who answered “I participate” as those who participate and those who said “I participated” or “I have never participated” as those who do not participate. As a result, 54.5% of the original samples covered by the individual questionnaires, or 9,376 persons (males: 4,626; females: 4,750), were used for the analyses in this study. In addition, we exclude those samples having no data for some of the variables used in the analysis in question.

## 2-2. Study sample

We start with observing what kind of people are excluded from safety nets. According to the definition stated above, we find that those who participate in both public pension and health insurance plans account for 89.7% of the whole sample. This means that those who are not protected by safety nets due to non-participation in one or both of the plans amount to roughly

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<sup>1</sup> In the case of public pension plans, it is difficult to understand precisely the meaning of “participation” for those above 60 years; it may indicate either that they are paying premiums or that they are receiving pension benefits.

10% of the working generation. This figure appears to be exaggerated; there must be some respondents who have limited knowledge about their public insurance plans.<sup>2</sup> However, it suggests that a non-negligible portion of the population are excluded from safety nets, although social security systems in Japan are often characterized as universal.

More specifically, the people who do join either a public pension plan or health insurance plan account for 8.6% and 4.8%, respectively, and those participating in neither of the plans, 3.2%. It is natural that the non-participation rate of health insurance plans is lower than that of public pension plans, considering that the risk of diseases is more imminent than that of insufficient income in old age.

### 3. Why are people excluded from safety nets?

#### 3-1. Socioeconomic factors affecting participation in social insurance plans

This section summarizes the socioeconomic characteristics of those excluded from safety nets.<sup>3</sup> Figure 1 shows how income levels differ between participants and non-participants in social insurance plans.<sup>4</sup> The average annual income of males and females who do not participate in either one or both of public pension and health insurance plans is about 51% and 42%, respectively, of that of participants in both plans. The annual income of those who participate in neither a public pension nor health insurance plan is only one-third that of those who join both plans, both for males and females. These figures underscore that the payment of premiums is highly related to income constraints

The next question is how participation in social insurance plans is related to the

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<sup>2</sup> The dependent spouse and other family members do not need to pay social insurance premiums, so some of them in the NSSPL may have answered that they do not participate in any social insurance plan.

<sup>3</sup> Many empirical analyses have been conducted as to non-participation in the social insurance plans and non-payment of their premiums, mainly regarding the NPI. It has often been pointed out that the main reasons for non-payment of NPI premiums are liquidity constraints and joblessness for a long time (Abe, 2001; Suzuki and Zhou, 2001; Suzuki and Zhou, 2006; Yuda, 2006; Komamura and Yamada, 2007; Sakai, 2009). Non-participation in public health insurance and long-term nursing care insurance plans as well as non-payment of their premiums have often been analyzed as well. For example, Yuda (2006) and Sakai (2009) found that liquidity constraints are a key determinant of non-payment.

<sup>4</sup> Average annual income for all the samples is 5,221,000 yen for males and 1,775,000 yen for females.

occupational status of people. On the basis of the questionnaires for the NSSPL, we classify occupational status into regularly employed (including managers at companies, organizations, etc.), non-regularly employed (part-timers, temporary workers dispatched from staff agencies, and contract employees/temporaries), self-employed (including family members working for family businesses), home (those engaged in housework exclusively), others, and unemployed. Figure 2 compares the rates of non-participation in a public pension plan and health insurance by the foregoing occupational status classification. As evident from this figure, the rates of non-participants in a public pension plan and health insurance plan are as low as 3.6% and 2.0%, respectively, for regular employees, compared to 11.7% and 6.5% for non-regular employees; those of other occupational status are considerably higher than that of regular employees.

The fact that the participation in social insurance plans is closely related to occupational status can easily be understood in the light of the premium payment system of the current social insurance plans. Regular employees are covered by the Employees' Pension Insurance (EPI, for private sector employees) or a Mutual Aid Association (for public sector employees), and the premiums for these plans are automatically withdrawn from their salaries. Hence, regular employees are unlikely to be excluded from social insurance plans. In contrast, a non-negligible portion of non-regular employees is not covered by any employees' insurance plan nor by social insurance plans for the self-employed and farmers, such as the NPI and National Health Insurance (NHI).

To be sure, non-regular employees are supposed to be covered by the NPI and NHI. However, their income is much lower than that of regular employees, making it difficult for them to pay their premiums. For the samples used in this analysis, the average annual income is 4,775,000 yen for regular employees as compared with 2,211,000 yen for non-regular employees and 3,521,000 yen for self-employed persons, indicating large income gaps between regular employees and other groups.

Even if non-regular employees pay premiums, they face their regressive aspects; the fixed-amount premiums (for the NPI) or the fixed-amount part of premiums (for the NHI) are relatively heavy for low-income households. Although measures to reduce the amount of or to exempt from premiums are taken for low-income individuals, the heavy burdens on them are

not fully alleviated. Thus, there is a possibility of being excluded from safety nets for those other than regular employees under the current social insurance plans.

It is also reasonable to expect that the more frequently people change jobs, the more likely they are to be uncovered by social insurance plans. We have to control for age, however, because the frequency of job changes naturally increases with age. We have to control for sex as well, because women tend to change their occupational status from full-time employees to part-time workers once they get married. Figure 3 shows the odds ratios for being uncovered by public pension and health insurance plans in response to the number of job changes, after controlling for age and sex, using those who have never changed jobs as a reference.

For public pension plans (figure at left), the odds of being uncovered for those who have changed jobs once or twice are, respectively, 0.96 times and 1.17 times that of those with no change in jobs. In both cases, however, the 95% confidence interval of odds ratios shown by bars includes 1, showing no significant difference between them. For people who have changed jobs three times, four times, or more, the odds ratios are 1.31 and 1.76, respectively, both of which are significant. For health insurance plans (figure at right), the odds of being uncovered are not significant for those who have changed jobs up to three times. This suggests that the imminent risk of diseases is much more serious than reduced pension benefits, which is not likely to be realized until people become old.

It is natural that as people change jobs more frequently they become more likely to lack coverage by social insurance plans. When people change jobs, they may find it difficult to switch to another social insurance plan or may forget to do the necessary procedures. However, Sakai (2009) argued that a continuous no-earnings period after leaving the job has a larger impact on non-participation than missing the procedures for switching to a new plan. It is impossible to distinguish between the effects of job changes and low income in our estimation. Indeed, we find that the average income of those having never changed jobs is 4.59 million yen, compared to 3.63, 4.04, and 2.98 million yen for those who have changed jobs once, twice, three times, four times, or more, respectively. Thus, we can suspect that people tend to face tighter income constraints as they change jobs.<sup>5</sup> Moreover, the proportion

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<sup>5</sup> It should be noted that the average income is a little higher for those who have changed jobs four times or more than others. It suggests that there are some people who repeatedly change jobs for higher earnings,

of regular employees is 50.8% for those who never changed jobs, compared to 36.1%, 32.4%, 32.9%, and 30.8% for those who have changed jobs once, twice, three times, and four times or more, respectively.

Next, we focus on academic attainment, another important socioeconomic factor. Figure 4 highlights the influence of academic attainments on non-participation; both for public pension and health insurance plans, the lower educational attainment is, the higher the rate of non-participants becomes. The proportion of non-participants in any public pension or health insurance plan is 4.2% and 2.3% for those who graduated from a university or a higher institution, respectively, but as high as 15.8% and 8.3% for those who graduated from junior high schools. However, the results in Figure 4 may reflect not only the direct effect of educational attainment but also its indirect effect through income and occupational status.

Finally, we examine how living conditions in the past differ between participants and non-participants in social insurance plans.<sup>6</sup> The respondents of the NSSPL were asked to choose their answer about their living standards at several points of time in the past on a five-point scale: “very low,” “low,” “average,” “high,” and “very high.” Figure 5 compares participants and non-participants in social insurance plans in terms of the rates of those who answered “very low” or “low” at certain points of time. As evident from this figure, non-participants assess their living standards as lower than those of participants at each point of time in the past. Because these answers were based on the respondents’ memories, caution should be exercised in interpreting them. However, we can suppose that current non-participation in social insurance plans is affected not only by current living conditions but also past ones.

### 3-2. Regression analysis

The analyses discussed thus far have limitations; when examining how a particular factor is related to non-participation in social insurance plans, interactions with other socioeconomic factors are not considered. For example, the rate of regular employees is considerably lower

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taking advantage of the high-level specialized skills they have acquired.

<sup>6</sup> There have been many empirical studies that discussed the impact of childhood poverty on socioeconomic outcomes in later life (Duncan *et al.*, 1998; Oshio *et al.*, 2010; Abe, 2011; Oishi, 2007).

for non-participants than participants, but this is likely to be related not only to differences in occupational status but also to different levels of income and/or educational attainment. Therefore, we explore regression analysis here to analyze the associations of non-participation in social insurance plans along with various factors.

For regression analysis, we construct a binary variable that is equal to 1 for non-participation in social insurance plans (public pension and health insurance plans, respectively) and to 0 for participation, and estimate three types of probit models to explain non-participation. In Model I, we employ three independent variables: poverty at age 15 (1 for “very low” and “low”; base = all other cases), sex (base = males), and age (20s, 30s, 40s; base = 50s). Poverty at age 15 is chosen as a variable representing the living standard in childhood. At age 15, individuals are at the final stage of compulsory education and entirely dependent on their parents in most cases. We examine how poverty at age 15 affects non-participation in social insurance plans in later life, after controlling for sex and age.

In Model II, we include five sets of independent variables. These are academic attainment (graduated from junior and senior high schools; base = graduates from universities or above), occupational status of the first job (non-regularly employed, self-employed; base = regularly employed), frequency of job changes (once, twice, three times, four times or more; base = none), and marital status (unmarried, divorced, separation by death; base = married), as well as the independent variables used for Model I. We attempt to examine not only the associations of non-participation in social insurance plans with these five factors but also how the impact of poverty at age 15 is changed by adding them as independent variables.

In Model III, we further add income variables to Model II including five dummy variables of no income and 1st (lowest) to 4th quintile of income (base = 5th quintile of income). The earlier studies generally show that income constraints increase the probability of non-participation in social insurance plans. Model III aims at examining how the relation between the other variables and non-participation in social insurance plans is changed by adding income variables.

All of the three models have a common problem: poverty at age 15 is not free from the recall bias, because it is based on the respondent’s retrospective and subjective assessment. To reduce this bias, we estimate the recursive bivariate probit model, which consists of (i) the

main equation for predicting current non-participation by poverty at age 15 and other variables and (ii) the auxiliary equation for predicting poverty at age 15 by the instrumental variables. As the instrumental variables in the second equation, we include co-residence with parents (living separately from father, living separately from mother, living separately from both parents; base = living together with parents), the breadwinner (parents, mother only, any person other than parents; base = father only), and the number of siblings (including the respondent) (two, three, four or more; base = the case where the respondent is the only child). In addition, we include sex (base = males) and age (20s, 30s, 40s; base = 50s) as control variables.

Tables 2 and 3 summarize key estimation results for non-participants in public pension and health insurance plans, respectively. The results of the auxiliary equation for poverty at age 15 and that of the estimated results of sex, age, and other control variables are not presented to save space. The results are presented in terms of marginal effects, which show to what extent the probability of non-participation in a public pension or health insurance plan increases when the value of each of the variables increases from 0 to 1, assuming that all the other variables do not change.

From Tables 2 and 3, we obtain the following findings. First, the comparison between Models I and II reveals that the impact of childhood poverty is substantially mediated by subsequent socioeconomic factors. The impact of poverty at age 15 is significant for non-participation in both public pension and health insurance plans in Model I, where subsequent socioeconomic factors are not controlled for. In contrast, in Models II and III, where these factors are controlled for, the impact of poverty at age 15 is insignificant for health insurance plans, and less significant for public pension plans.

Second, the comparison between Model II and Model III underscores that participation in public pension and health insurance plans is affected differently by current occupational status. In Model II that does not include income, current occupational status has a significant impact on non-participation in health insurance plans. In contrast, it becomes insignificant in Model III that does include income. For public pension plans, the impact of the current occupational status remains significant even if we included income.

We also notice that, especially for public pension plans, the probability of

non-participation is higher among those whose first job takes the form of non-regular employment. Meanwhile, the impact of the frequency of job changes on non-participation differs between public pension and health insurance plans. It is not significant at all for health insurance plans, whereas it is significant for public pension plans only if no income factor is taken into account and the frequency is four times or more. These results are not consistent with the results shown in Figure 3, suggesting that the association between the frequency of job changes and non-participation is considerably absorbed into the association with other socioeconomic factors, especially income.

#### 4. What happens when people are excluded from safety nets?

##### 4-1. Savings and preparation for old age

The next question is how those protected by safety nets and those excluded from it differ with respect to economic and health conditions in terms of savings, preparation for old age, and health conditions. It is difficult to identify causality between non-participation in social insurance plans and economic/health conditions, and non-participation and unfavorable conditions may be explained by common factors such as income and occupational status. Still, it is important to examine the extent to which exclusion from a safety net can be a proxy of unfavorable status with regard to well-being. If we observe that those excluded from safety nets suffer greater difficulties in their daily life than those protected by safety nets, it may have an important implication for constructing safety nets.

We start with focusing on savings and preparation for retirement in Table 4. As evident from this table, the level of savings of non-participants in social insurance plans is considerably lower than that of participants. This tendency is more marked for non-participants in public health insurance plans than those in public pension plans. This is consistent with the fact that non-participation depends on the income factor for health insurance plans more so than for public pension plans.<sup>7</sup>

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<sup>7</sup> Another possible explanation may be that those who do not save much money have a preference for high living and/or low risk aversion and therefore do not think that social insurance is attractive. The validity of



In the case of public pension plans, however, there may be people who prefer not to rely on public pensions, especially among those who are not automatically covered by the EPI. In reality, however, the rate of those who are saving money or who join a personal pension plan to prepare for old age is lower for non-participants in public pension plans. This suggests that there is no substitutable relationship between public pension plans and personal saving for old age. If we look at the participants in personal pension plans only, non-participants in public pension plans pay a somewhat higher amount of premiums (21,400 yen a month on average) than participants (18,900 yen); however, it should be noted that there is considerable variance of premiums.

The respondents in the NSSPL were asked about the main income sources that they planned to rely on after age 65 years (multiple answers). Non-participants in social insurance plans have a much higher rate of those who answered “have no plan” than participants, and their reliance on public and personal pension plans and savings is low in general.<sup>8</sup> The proportion of those who plan to continue working in their old age and rely on wage income is a little higher among non-participants in any public pension plan than those in other groups. Meanwhile, the intention to rely on public welfare support is not very high among them, suggesting no serious moral hazard problem among non-participants in social insurance plans.

#### 4-2. Health conditions

Finally, we examine the association between non-participation in social insurance plans and health. As health variables, we utilize four measures obtained from the health questionnaires for the NSSPL. First is self-rated health. The respondents in the survey were asked to answer the question “How is the condition of your health at present?” on a five-point scale: “good,” “somewhat good,” “average,” “somewhat poor,” and “poor.” We set up a binary variable for the lowest two categories (“somewhat poor” or “poor”). Second is subjective symptoms. We allocated one to the answer “yes” to the question “Do you have any problem (subjective symptom) due to an illness, injury, or other issue in recent times?” Third is the quality of life:

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this explanation is discussed later.

<sup>8</sup> It is strange to observe that the rate of those who answered that they will rely on public pension benefits was over 60% among those who did not join any social insurance plan.

whether any health problem affects the respondent's daily life. We allocated one to the answer "yes" to the question "Does any health problem affect your daily life at present?"

In addition to these variables of general health conditions, we consider K6, which is a widely used measure of depression (Kessler *et al.*, 2002). The respondents were asked to answer the six questions: "Have you become nervous?" "Have you felt a sense of despair?" "Have you felt restless and unsettled?" "Have you felt depressed and your spirits not been lifted no matter what happened?" "Have you felt anything you do will be useless?" and "Have you felt you are a worthless person?" on a five-point score: "always," "usually," "sometimes," "occasionally," and "never." We assign a score to each of these answers, 0 (= "never") to 4 ("always"), and calculate the total of the scores for the six answers (0–24). It has been accepted that a score of 13 or more indicates serious mental disorder and a score of 5 or more shows the existence of psychological stress on a general level (Kessler *et al.*, 2010; Sakurai *et al.*, 2011).

We conduct logit regression analysis to assess the association between non-participation in social insurance plans and health at two stages. At the first stage, we control for sex and age only. At the second stage, we control for not only sex and age but also socioeconomic factors and marital status. Non-participants in social insurance plans tend to be in a socioeconomically disadvantaged position, especially in terms of income. Hence, even if health is found to be poorer among non-participants in social insurance plans than among participants at the first stage, that does not necessarily mean that non-participation in social insurance plans are the problem. This is why we conduct the second stage analysis. As the socioeconomic factors and marital status are to be controlled for, we utilized the same variables used for Tables 2 and 3.

The estimation results are summarized in Table 5. This table shows the odds ratios (as well as their 95% confidence intervals) of each health status for non-participants in a public pension plan (upper columns) and in a health insurance plan (lower columns). The left half of the table summarizes the results obtained at the first stage where only sex and age are controlled for, while the right half summarizes those obtained at the second stage in which the socioeconomic factors and marital status are additionally controlled for. From this table, we can observe the following points:

First, the odds of poorer health conditions are significantly higher among non-participants than among participants for both public pension and health insurance plans, with the association between non-participants in public health insurance plans and subjective symptoms being the only exception. It should be noted, however, that the observed association can be at least partly spurious, as both poor health conditions and non-participation in social insurance plans are caused by other common factors.

After additionally controlling for socioeconomic factors and marital status, we observe that the odds ratios of poor health conditions for non-participation in social insurance plans become smaller in general, with the association between non-participants in public pension plans and subjective symptoms being the only exception. A closer look at the results reveals that the associations of non-participation in public pension plans with self-rated health and subjective symptoms remain significant, while other associations become insignificant.

More interestingly, the association with depression remains significant for both public pension and health insurance plans, even after controlling for socioeconomic factors and marital status. These results underscore that a defenseless state against social risks due to exclusion from safety nets has a negative psychological effect, supporting the view that people are risk averse in general. A lack of coverage by social insurance plans makes individuals psychologically unstable.

## 5. Summary and policy implications

In this study, we have examined what socioeconomic factors are associated with non-participation in social insurance plans and how exclusion from safety nets affects people's well-being and health, using the micro data collected from the two social surveys in Japan: NSSPL and CSLCPHW. Key findings are summarized in what follows.

First, non-participation in social insurance plans is associated with several disadvantageous socioeconomic factors in childhood and later life. The impact of childhood poverty raises the probability of non-participation in social insurance plans, and a substantial portion of the impact is mediated by subsequent socioeconomic factors such as academic

attainment, occupational status, job changes, and income. In the case of the public pension plan, however, the impact of childhood poverty remains even after being mediated by other factors.

Second, the associations between non-participation in social insurance plans and socioeconomic factors differ for public pension and health insurance plans. For health insurance plans, income is a dominant determinant of non-participation in them. For public pension plans, not only income but also occupational status matters; occupational status other than that of regular employees serves as a constraint on participation in them.

Third, non-participants in social insurance plans cannot afford to save money in general and have no adequate preparation for old age. Those who stay outside safety nets have not voluntarily chosen such a situation; non-participation in social insurance plans means the same thing as being placed in a socioeconomically disadvantageous situation.

Fourth, those excluded from safety nets are in unfavorable health conditions. This situation is especially serious for non-participants in public pension plans. In addition, even after controlling for socioeconomic and other factors, non-participants in social insurance plans have a greater degree of depression than participants. An exposure to social risks without any protection by social insurance plans has a negative impact on mental health.

These results have clear policy implications; policy measures aimed at avoiding any further increase in those excluded from safety nets are needed. Most of all, the fact that lower income and unstable working conditions such as non-regular employment raise the probability of non-participation in social insurance plans highlights the problem of the existing social insurance plans. In fact, social insurance plans other than those for employees such as the NPI and NHI have the fixed component of premiums, which is regressive in nature despite some measures to alleviate it. In addition, when people repeatedly change jobs as non-regular employees, they tend to fail to smoothly make the switch to new social insurance plans. Combined with income constraints, this situation is likely to raise the possibility of their being excluded from safety nets.

To sustain social security benefits at an adequate level under the impact of declining birth rates and an aging population, the only recourse is to increase the social security contributions and taxes on the working generation. Hence, the factors that exclude people from safety nets