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ORIGINAL ARTICLE

Shaky social insurance foundation: Income instability and pension participation in South Korea

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Abstract

Objective: Many welfare states in young democracies feature low effective social insurance coverage, especially in old-age pension. What explains the ineffective coverage? This article shows individual income instability is a microlevel factor contributing to low effective coverage.

Method: The article used 15 waves of the Korean Labor Income Panel Study and constructed a fine-grained individual-level income instability measure, which was used to predict individual participation in state-run public pension using (multinomial) logistic models with industry, occupation, and cohort fixed effects.

Result: The article shows that income instability is negatively associated with public pension participation, and the negative relationship becomes larger as income level increases. Moreover, income instability inhibits only participation in state-led risk pooling, but not in private self-insuring.

Conclusion: The article sheds light on disentangling an individual-level factor buttressing young welfare states and bears implications for the future contour of welfare states in young democracies.

KEYWORDS
income instability, public pension, young democracies

The welfare state landscape in young democracies features limited social insurance coverage. Common across Asia, Africa, and Latin America, *effective* social insurance coverage has been significantly lower than *legal* coverage, especially in the domain of old-age pensions (International Labour Office 2010). The "truncated" welfare state structure bears huge implications on citizens' social policy preferences (Holland 2018), coverage expansion route (Niedzwiecki 2018), and even evasion behavior outside of the social policy realm (Castañeda, Doyle, and Schwartz 2020).

Existing research attributes ineffective social insurance coverage to various causes. Low state capacity and economic underdevelopment are usual suspects (Mares 2005; Rothstein, Samanni, and Teorell 2011). However, variation exists across policy domains within the same country, with pension suffering more ineffective coverage than health insurance (International Labour Office 2010). Others argue that protection regimes in Global South include private/informal security regimes. Alternative security provisions

substitute state-run welfare programs (Wood and Gough 2004). Large informal economy also affects both informal workers' free-ride behaviors and formal workers exiting from public programs (Levy 2008).

This article proposes another microlevel factor contributing to the widening gap between legal and effective social insurance coverage in young democracies: individual income instability. Income instability, an inherent feature of a flexible labor market that goes beyond one's employment status, is the level of income volatility experienced by individuals over time. This article argues that income instability truncates individuals' time horizons, incentivizing them to stabilize income flows to meet present needs at the expense of future needs. In other words, income instability creates a new trade-off problem for insecure citizens between *present* and *future* security. Because social insurance requires citizens' continuous contributions for future benefit eligibilities, such feature creates an *intertemporal* dimension that functions poorly with rising income instability. Since households with income instability must self-insure for present needs, they often do so by foregoing participation in social insurance that helps pool risks with other citizens against future risks. At the aggregate level, income instability contributes to the widening gaps between social insurance's effective and legal coverages in young welfare states.

The article tests the argument using the case of South Korea. South Korea is a member of the Organization for Economic Co-operation and Development (OECD), but it was democratized only in the late 1980s and began building its welfare state around the same time. South Korea has long been viewed as a developmental state model with strong state capacity (Amsden 1989). As some would assume that low effective coverage rate is merely the result of low state capacity, South Korea presents a conservative test for the income instability hypothesis. South Korea launched the National Pension Scheme (NPS) in 1988 and has ushered in the era of "coverage for all" since 1999. Contribution exemption is possible in events of income disruption (i.e., unemployment, accidents, etc.), but one should actively report to the NPS and start contributing again once s/he resumes income generating activities. As such, even though the NPS is mandatory for most citizens, it creates a "quasi-voluntary" equilibrium because citizens have to make some effort (however minimal it is) to be active contributors of the NPS, and such a feature is common in many young democracies.

With empirical evidence from the Korean Labor Income Panel Study, this article shows that, all else equal, unstable income damps individual participation in public pension, and the effect is contingent upon a person's income level. The negative association between income instability and social insurance participation becomes larger as income level increases. Even after controlling for one's employment status, income instability still holds explanatory power and predicts public pension participation. Moreover, income instability inhibits only participation in state-led risk pooling, but not in private self-insuring methods (e.g., assets and savings) because the time horizon assumed in public pension is more distant and fixed.

Despite extensive scholarship on the microfoundations of redistributive (i.e., noncontributory) policies, the microfoundations of social insurance (i.e., contributory policies) have been largely overlooked. As social insurance absorbs a big chunk of government budgets and bears significant implications for redistribution (Korpi and Palme 1998), it is of equivalent importance to study social insurance with the bottom-up approach. In particular, Asia remains a blind spot in the microlevel discussion of the welfare state. This article contributes to disentangling the individual-level root buttressing young welfare states and discusses the political sustainability of social insurance in new democracies.

SOCIAL INSURANCE AND LABOR MARKET IN NASCENT WELFARE STATES

Social insurance is the central pillar of modern welfare states, absorbing most government social policy budgets. Social insurance is developed and expanded with the expectation of full-time employment structure. Complementing stable wage and employment structure in labor markets, social policies play auxiliary roles and help alleviate the "residual risks" for workers when they exit labor markets for various reasons. Social insurance protects citizens against life-course contingencies and is financed from contributions by workers and employers (and sometimes governments) on a regular basis. As such, lengthy and continuous contributions are required prior to benefits, creating an intertemporal dimension between contribution and

social insurance benefit. Of all the life contingencies, old age poses the longest intertemporality between contribution and benefit.

In developed countries, continuous contributions were attainable in the postwar era when industrialization peaked with a full-time employment structure. Yet, the nature of work and the labor market has changed by the dual processes of globalization and deindustrialization since the 1970s. Full-time employment and steady (and rising) income streams are no longer guaranteed. Instead, vulnerable employment—including nonstandard forms of employment and labor informality[1]—is rising around the world. Individual career profiles have become much more complicated. It is common for workers today to change jobs several times during their working lives. Workers are also more likely to hold multiple jobs simultaneously to make ends meet.

Income instability becomes an embedded trait of rising job insecurity. First, for people holding nonstandard or informal jobs, income is a direct function of hours worked or business done, leading to higher income volatility. For example, contract-based workers earn their incomes based on the number of jobs they have. Part-time workers' income is contingent upon the number of working hours. Informal sector workers are exposed to varying degrees of income instability too. Farmers and casual workers experience seasonal income flow variations, and street vendors are faced with income instability on a daily basis. Second, in a flexible labor market, job turnovers become common and more frequent (especially for temporary or fixed-term contract workers). Losing or changing jobs engenders a certain level of income variability.

Even though income instability is a feature associated with a flexible labor market, it is not a proxy for nonstandard employment or the informal sector. Income instability transcends the boundary of one's position in the labor market. With growing labor market flexibility, job turnovers and transitions in and out of the formal sector have become more frequent. More turnovers imply higher instability. Employment status captures only a person's static position. Employment status does not tap onto the earning dynamic beyond this static moment.

Despite the changing contour of labor market structure, many third-wave democracies just started to construct their national social insurance schemes. Electoral competition pushed political elites to offer more social protection to the general public (Kaufman and Haggard 2008). In Asia, countries show resemblance in that governments expanded existing, yet limited, social insurance programs to include the majority of private sector workers. Though social protection has been expanded on the paper, effective coverage has been significantly lower than legal coverage. Not just in Asia, low effective coverage has been a tough policy issue in many nascent welfare states (International Labour Office 2010).

INCOME INSTABILITY ON SOCIAL INSURANCE PARTICIPATION

How does rising labor market flexibility impact nascent welfare states? Specifically, how does individual income instability affect social insurance participation? In the welfare state literature, present and future incomes are crucial in affecting people's support for redistributive policies (e.g., Meltzer and Richard 1981; Rueda and Stegmueller 2019). However, existing welfare state literature does not adequately address the social base of social insurance and it does not discuss the role of income fluctuation in individual preference formation.

To unpack the effect of income instability/fluctuation, the poverty trap research provides a useful starting point (Alderman and Paxson 1992; Dercon 2002; Mani et al. 2013). This line of research identifies *uncertainty*, which is the risk and the unknown to guarantee future income stocks and flows, as a primary defining characteristic of poverty (Wood 2003). Risk and uncertainty prompt poor people to be more risk averse, and to search for immediate security. Two behavioral patterns emerge from avoiding

[1] The concept of nonstandard jobs differs from but overlaps with the concept of labor informality, which includes economic activities not covered, by law or in practice, with enough (or any) legal protection. For example, temporary employment or part-time work can either be in the formal or informal sector, depending on whether legal protection is formally institutionalized and properly implemented.

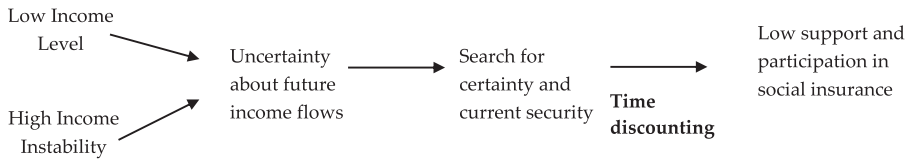

FIGURE 1 Income-induced resource scarcity and intertemporal decision making

uncertainty. First, in searching for security, poor people behave in a way that helps deliver short-term security, which sometimes creates conditions that are unfavorable for long-term security. Second, in the absence of strong state institutions and a well-functioning market, poor people turn to existing social resources and networks (i.e., family or community) for security. Their behaviors create and reproduce structures of "dependent security" that are unhelpful for investment essential for producing long-term security (Wood 2003).

Informed by the poverty trap literature, this article argues that income instability shares the same characteristics as poverty, in that the volatile nature also means future income is unpredictable. In other words, income instability should prompt people to live for the present at the expense of future security. The truncated time horizon induced by income instability incentivizes people to make stabilizing income as their priority.

Since the intertemporality between contributions and benefits is a key defining feature of social insurance, the truncated time horizon caused by income instability does not match, and becomes much shorter than the time horizon assumed or required for participation in a social insurance program. Insuring for future stability should be important, but insecure households are occupied with a more urgent priority: *present stability*. In other words, people are shortsighted at the expense of long-term planning when under the pressure of unstable earning patterns. In some sense, if buying social insurance involves paying a premium for certainty in the future (Barr 2004), the cost of stabilizing income is a premium individual pays for certainty in the present.

Of all types of social insurance schemes, old-age security should be the realm affected the most by high-income instability. Compared to other social insurance programs (i.e., health, unemployment, and work injury), public pension entails the longest intertemporality between contribution and benefit. The issue gets worse if the benefit structure leans more proportional to earning oriented than redistribution oriented because public pension will function more like a compulsory deferred compensation, dampening people's interest to participate even further.

Figure 1 distinguishes between two causes of income-induced truncation of time horizon and the mechanisms affecting social insurance participation: low-income level and high-income instability. Although these two causes can coexist, they are distinctive factors that both contribute to the demand for certainty, which in turn truncates individuals' time horizons and lowers participation in social insurance.

The poverty trap literature shows that poverty subjects vulnerable individuals to shorter time horizons and lowers their demand for future security. However, low incomes and high levels of income instability usually go hand in hand for the poor (Collins et al. 2009). The existing poverty research does not tease out the independent effect of income instability. While conflating the effect of low-income levels and high-income instability does no harm when studying poverty, teasing out the effect of high-income instability helps identify another nonpoor subgroup that might also suffer from lack of certainty and that otherwise would have been overlooked in the existing poverty research. Even though people with unstable incomes are not necessarily poor, they think and behave in similar ways as the poor. As income instability caused by labor market flexibility has become common for workers, the nonpoor yet economically unstable is the fast-growing subgroup, pressing the need to theorize the impacts of income instability.

Building upon this logic, income instability should have negative impacts on social insurance participation. With the truncated time horizon induced by high-income instability, the first hypothesis that can be tested should be

Hypothesis 1: Unstable income earner has a lower likelihood of social insurance participation, ceteris paribus.

Moreover, due to the similar impacts of poverty and income instability on time horizon, the effect of income instability is only observable when it passes a certain threshold:

Hypothesis 2: The negative association between unstable income and social insurance participation should be moderated by income levels.

As the first paper examining how income instability impacts social insurance participation, I test my argument with the old-age security social insurance programs. I test the hypotheses in one of the most developed nascent welfare states: South Korea.

PUBLIC PENSION IN SOUTH KOREA

For a long time, South Korea has been a model example of the developmental state (Amsden 1989); yet, its social protection regime has remained nascent. Major reforms on public pension and national health insurance only began in the 1980s, coinciding with the country's democratization progress. With regard to old-age protection, the majority of citizens are now protected under the NPS, which was legislated in 1988.[2] The NPS is a partially funded Defined Benefit program that covers all wage and nonwage persons, including farmers and fishermen. Wage workers enroll into the NPS through workplaces, while nonwage workers register to the NPS as an individually insured person through local branches. The contribution rate is set at 9 percent: 4.5 employer and 4.5 employee for wage workers, and 9 percent for nonwage earners. The NPS has a lower contribution rate compared to other OECD countries whose average rate to the public scheme is 15.4 percent (OECD 2017). Like other OECD members' public pensions, the qualifying conditions for the NPS benefit are strict. Twenty years of active contribution are required for full pensions and 10 years for partial pensions. In 2019, of the 21 million legally covered population in the national pension, only 14 million people (around 67 percent) registered and were actively contributing. Still 7 million potential contributors failed to contribute (e.g., defaulter or exempts, etc.) (National Pension Service 2020).

The most important feature of the NPS is that its benefit entitlement and benefit level are highly contingent upon a person's income and contribution history. Either inadequate contribution or interrupted contribution would lead to limited or no entitlement to the NPS benefits. In this sense, the NPS is a truly contribution-based program. However, the Korean labor market falls short in providing an opportunity structure that works with the NPS's institutional design. Koreans' main lifetime jobs last, on average, 10 years shorter than those of advanced economies, and its nonstandard employment and labor informality are more prevalent than other OECD members (Klassen and Yang 2013). The institutional mismatch creates a huge gap between the de jure coverage and the de facto coverage, gradually eroding the legitimacy of the NPS. South Korea's social security regime presents an ideal setting to study the relationship between income instability and social insurance participation.

DATA, VARIABLE, AND MODEL SPECIFICATION

I test my argument using data from the Korean Labor Income Panel Study (KLIPS), a national longitudinal panel study that started eliciting detailed labor-related information after the 1997 Asian Financial Crisis. The KLIPS also includes additional (single-wave) surveys related to specific social groups and issues. The

[2] Only three occupational groups (public employees, military personnel, and private school teachers) are entitled to special pension schemes. These special schemes were created before the NPS and are contribution-based social insurance programs but provide more generous benefits.

additional survey in wave 18 (2015) targeted middle- and old-age persons (aged between 50 and 74) and their living conditions, eliciting retirement-related information. Moreover, the KLIPS has collected more comparable cross-wave income data starting from 2003 (wave 6), so I rely on income data from the sixth wave onward, with the total coverage of 15 years, to trace individual income instability levels.

Measuring income instability

Income instability is operationalized as the amount of income variation an individual experiences relative to their average income. I constructed the measure using the following steps. First, I top- and bottom-coded income by wave to exclude extreme values and adjusted income using the consumer price index and converted it to US dollars. Second, I calculated each individual's mean total income over time and the associated standard deviation. I then divided the income standard deviation by the mean income and multiplied it by 100 to yield the coefficient of variation of income for each individual who has at least five waves of income data to more accurately capture volatility over time. The measure reports the level of income fluctuation as a percentage of the mean value.[3] This conceptualization brings two advantages. First, it is a direct operationalization of how unstable workers' incomes are throughout their working lives. Second, it is a standardized measure that allows comparability across individuals.

It is possible that an individual's income is volatile because their income increased or decreased over-time. To guard against this possibility, I regressed the total income from each wave against time for each individual. If the coefficient for time is insignificant, it is reasonable to infer that the individual's income has remained unchanged over time, or at least has not changed significantly beyond the inflation rate. In the empirical analysis, I run the same model using both with the whole sample and with the subsample of individuals whose income trend remains unchanged over time. The results are the same, showing that income instability is not a proxy for upward or downward social mobility.

I also calculated each individual's average income level. For simplicity's sake, I converted the income levels into 99 percentiles in the analysis (*Income percentile*). For both income levels and income instability, I used the annual after-tax earned income in the data set, a measure more preferable to before-tax earned income.

An additional analysis shows that Income instability is not a proxy for any specific employment type, industry, or occupation. Even though low-income earners experience higher income instability due to the mechanical relationship between income levels and income instability, the correlation between the two is only −0.27. The distribution of income instability becomes more spread out as income increases. For more details about the characteristics of income instability in South Korea, see Supporting Information Appendix A.

Dependent and control variables

In the 2015 wave, respondents were asked: "Are you financially prepared or planning to prepare for retirement?" Respondents who answered "no" stopped here; respondents who answered "yes" were further probed about the top three financial means they used for retirement planning. Means of preparation include (1) national pension; (2) other public pension (occupational pension); (3) severance pay (retirement pension); (4) savings, deposits, saving-type insurance; (5) real estate management; (6) stocks and bonds; (7) private pension, etc. Such information was elicited only from respondents aged 50–74, regardless of whether they were in the labor market at the time of the survey.

[3] For example, the median value of *Income Instability* is 33 in South Korea, which means that the amount of income volatility an individual experiences over time is 33 percent of their mean income. With the same 33 percent variation, the absolute income change is higher for high-income earners than for low-income earners.

I constructed two dependent variables. *Plan Dummy* indicates whether respondents were prepared financially for retirement. As the question is general and abstract, it taps onto the general concept of future planning. Having no preparation at all automatically indicates that respondents were either not registered in or were not contributing to any public pensions. A second dependent variable, *Plan method*, is used to assess the mode of preparation. It takes a value of 1 if respondents reported no financial preparation at all, a value of 2 if a public pension (either national pension or special pension for specific occupations) was mentioned as a financial vehicle for retirement planning, and a value of 3 if respondents prepared for retirement only through private risk management methods (including company severance pay).

Only 39 percent of South Korean citizens over 50 reported undertaking any kind of financial preparation for retirement in 2015, similar to the estimation reported in existing studies (Kim 2012). Thirty-one percent of respondents utilized at least one type of public method. Only 8 percent relied on pure private methods for retirement planning. Simple *t*-test shows that home ownership does not decrease one's reliance on the public system. In other words, the lack of participation in (and reliance on) the public pension was not the result of a "substitution effect." Among citizens who had zero or insufficient financial preparation for retirement, fewer than 5 percent expected their children to support them.

I included a range of variables that can plausibly influence whether (and how) one plans for retirement. There is a huge literature on the determinants of retirement saving. The general consensus is that more future-oriented and more patient individuals are more likely to save for retirement (Hershey et al. 2007). More risk-averse people are also more likely to make retirement plans at an early age (Bajtelsmit and VanDerhei 1997). I controlled for both intrinsic characteristics and expect more patient/risk-averse people to engage in retirement planning.

State-provided pensions are not the only type of old-age income security. Studies have shown that there is a trade-off between the state pension system and other private retirement methods (Packard 2002). It is especially important to consider the effect of preparation alternatives in the context of nascent welfare states. First, the relatively late development of the public system means that there might be more private alternatives in place. Second, lower levels of bureaucratic retirement penetration in developing states provide more room to "evade" the public system and to substitute the public pension system with alternative retirement planning methods. Therefore, I include *Children, Home ownership, and Saving* in the model to capture the effects of alternative preparation methods.

With the rise of labor market flexibility, the labor market is now divided into a new insider–outsider dichotomy (Emmenegger 2012). The dualist view assumes there is no overlap between insiders and outsiders: a person either has both employment and income security, or neither. I included a dummy variable, *Unstable jobs*, to capture this effect. If the labor market is dualistic, this variable should absorb all the effect of income instability.

Last, I added a standard battery of basic demographic variables in the model, and some country-specific control variables to account for the idiosyncratic features of South Korea's old-age insurance scheme. For more information about the variables, see Supporting Information Appendices B and C.

I modeled the dependent variables with logistic (for *Plan dummy*) and multinominal logistic (for *Plan method*) regressions. To ensure that income volatility is not just a proxy for specific industries or occupations, and to account for other unobservable variations attributed to industries and occupations, I adopted industry-level, occupation-level, and cohort-level fixed-effect models in the econometric analysis. I also included age fixed effect in the model.

EMPIRICAL RESULTS AND DISCUSSION

Income instability and retirement preparation

A simple local polynomial regression of retirement preparation against income instability provides initial confirmation of my argument (see Figure 2). The likelihood of planning for retirement decreases as the

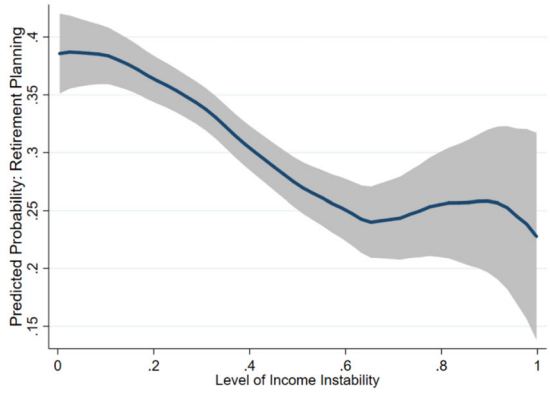

FIGURE 2 Retirement planning by income instability

level of income instability rises. Next, I evaluate the hypotheses with a thorough logistic/multinominal logistic analysis.

Table 1 shows the estimation results for *Plan dummy*, omitting the fixed-effect variables. I display all the coefficients as odds ratios for easy interpretation. A coefficient shows the odds of retirement planning with exposure to a particular variable, compared to the odds of doing so in the absence of such exposure. Therefore, when the odds ratio is 1, it indicates that exposure to a particular variable does not change the probability of retirement planning; when the odds ratio is above 1, variable exposure increases the odds of planning; when the ratio is below 1, it indicates the opposite.

Models (1) and (2) show the estimation results using the whole sample, which includes all respondents whose income volatility can be successfully calculated. I run the same empirical analysis using only the subsample of individuals whose income trend remains unchanged over time (Models (3) and (4)). The results resemble one another, showing that income instability is not a consequence of economic upward/downward mobility.

As hypothesized, income instability holds negative association with retirement preparation as coefficients of such variable are below 1 in Models (1) and (3). However, the coefficients did not pass the statistical test, indicating that lumping different income brackets together might average out the impacts of income instability since low incomers' behaviors remain the same across different income volatility levels.

The interaction term of interest is *Income instability* × *Income percentile*, and the expectation is that the coefficient (i.e., the odds ratio) should be below 1 because income instability should have a more negative association with retirement planning as income increases. The coefficients of the interaction term in Table 1 are in line with my expectation. Substantively, they are below 1; statistically, they are both significant at the 95 percent confidence interval. To better illustrate how the two variables interact with each other,[4] I visualize the effect of income instability on retirement planning for the poor and the nonpoor in Figure 3, with poor being at the bottom 33 percent of the income ladder.

The results show that for the nonpoor population, their retirement planning probability decreases significantly with rising income instability, as income fluctuation increases from 0 to 100 percent of their income from 48 percentage points to 35 percentage points. In contrast, the poor have relatively flat slopes across various levels of income instability and the changes are not statistically significant. Overall, the impact of income instability is more apparent for the nonpoor, and its effect rises as income goes up.

The effect of *Income percentile* is positive and statistically significant across models. Substantively, it means that when there is no income instability, the probability of planning for retirement increases by around 2

[4] Given that the coefficients of the constituent variables of an interaction term are not the average effects of that variable, but instead the marginal effect of the constituent variable while holding the other constituent variable at 0, it is not useful (and sometimes not even substantively meaningful) to interpret the constituent variables' coefficients of an interaction term.

TABLE 1 Income instability and retirement planning

	(1) Whole sample	(2) Whole sample with interaction	(3) Subsample	(4) Subsample with interaction
Income instability	0.82	3.42*	0.90	3.17
	(0.22)	(2.00)	(0.28)	(2.12)
Income percentile	1.02***	1.03***	1.02***	1.03***
	(0.00)	(0.00)	(0.00)	(0.01)
Income instability × *Income percentile*		0.97**		0.98*
		(0.01)		(0.01)
Male	0.87	0.84	0.77	0.74
	(0.11)	(0.11)	(0.12)	(0.12)
Age	1.02	1.02	1.02	1.02
	(0.02)	(0.02)	(0.02)	(0.02)
Education level	1.10*	1.09	1.09	1.08
	(0.05)	(0.05)	(0.06)	(0.06)
Risk aversion	1.02	1.02	1.00	1.00
	(0.03)	(0.03)	(0.04)	(0.04)
Patience	1.21***	1.20***	1.21***	1.21***
	(0.04)	(0.04)	(0.05)	(0.05)
Marital status	1.23	1.24	1.13	1.14
	(0.16)	(0.16)	(0.17)	(0.17)
Retired (dummy)	1.94**	1.89**	2.08**	2.01**
	(0.44)	(0.43)	(0.57)	(0.55)
Unstable jobs (dummy)	0.79	0.80	0.73*	0.74*
	(0.10)	(0.10)	(0.11)	(0.11)
Wage worker (dummy)	0.83	0.83	0.78	0.78
	(0.11)	(0.11)	(0.12)	(0.12)
Public sector (dummy)	2.11**	1.96*	3.13**	2.96**
	(0.60)	(0.57)	(1.12)	(1.07)
Children (dummy)	0.68*	0.66*	0.57**	0.56**
	(0.11)	(0.11)	(0.11)	(0.11)
Home ownership (dummy)	2.34***	2.29***	2.29***	2.24***
	(0.26)	(0.25)	(0.30)	(0.30)
Saving (dummy)	2.42***	2.42***	2.35***	2.34***
	(0.30)	(0.30)	(0.34)	(0.34)
Constant	0.01**	0.01***	0.03*	0.02**
	(0.02)	(0.01)	(0.04)	(0.02)
Fixed effect	Yes	Yes	Yes	Yes
Observations	2609	2609	1830	1830

Note: Exponentiated coefficients; standard errors in parentheses. *$p < 0.05$; **$p < 0.01$; ***$p < 0.001$.

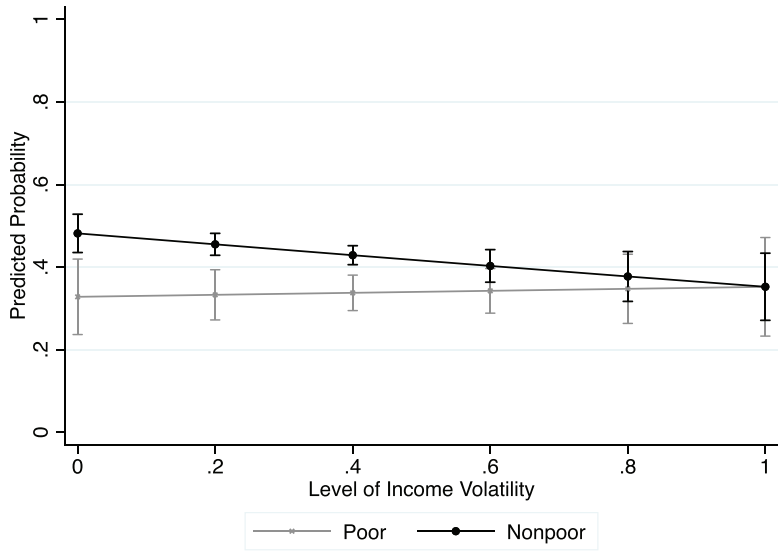

FIGURE 3 Predicted probability of retirement preparation by income instability and income percentiles

percent when one moves up one income percentile. In other words, for people with stable incomes, the chance of retirement preparation increases as income increases. Such stability buttressed the traditional social insurance model in developed countries for the most part of the 20th century. People of different income levels behave almost identically when their incomes are collected in a much more unstable way. When income fluctuates to a higher degree, the predicted probabilities of retirement preparation overlap for individuals across different income groups. High-income people behave more like poor income earners.

On other plausible determinants of retirement planning, *Risk aversion* is positively associated with retirement planning, yet the coefficient is not statistically significant. More patient and future-oriented citizens (*Patience*) are more likely to plan for their retirement. For alternative retirement preparation methods, having some type of private means of preparation (either *Home ownership* or *Saving*) is strongly associated with retirement planning, whereas having children decreases the likelihood of retirement planning.

With regard to work-related attributes, it is not surprising that *Retired* and *Public sector* have a positive and significant association. For retired people, retirement planning is a present rather than a future issue; public sector workers are linked to the special pension scheme and are probably the most stable workers in any country, so it is not surprising that they are more likely to plan for retirement. Moreover, the results for *Wage worker*, which denote whether one is in the informal sector, and labor market outsiders (*Unstable jobs*) are in the expected direction. However, income instability still has a significant impact after controlling for employment status. This finding shows that the effect of income instability is not limited to outsiders. The empirical findings of this article are in line with recent findings from other parts of the world (Baker and Velasco-Guachalla 2018), which refutes the "dualist view" of labor markets.

Income instability and public pension

To explore whether income instability decreases participation only in public pensions or in all kinds of retirement planning, I run the model with *Plan method* as the dependent variable. Table 2 shows the estimation results with both the whole and subsample, and with or without the interaction term.

The interaction *Income instability* × *Income percentile* is still negative (Models (2) and (4)), yet it loses significance in predicting retirement preparation with only private methods. A comparison with models without

TABLE 2 Methods of preparation and income instability

Baseline: no preparation	(1) Whole sample		(2) Whole sample with interaction		(3) Subsample		(4) Subsample with interaction	
	Public included	Private only	Public included	Private only	Public included	Private only	Public included	Private only
Income instability	0.67	1.61	3.70*	2.45	0.70	2.26	3.10	4.63
	(0.19)	(0.73)	(2.32)	(2.53)	(0.24)	(1.15)	(2.17)	(5.32)
Income percentile	1.02***	1.01**	1.03***	1.02*	1.02***	1.02***	1.03***	1.02*
	(0.00)	(0.00)	(0.00)	(0.01)	(0.00)	(0.01)	(0.01)	(0.01)
Instability × Percentile			0.97**	0.99			0.97*	0.99
			(0.01)	(0.02)			(0.01)	(0.02)
Male	1.00	0.51**	0.96	0.50**	0.89	0.42**	0.85	0.41**
	(0.14)	(0.12)	(0.14)	(0.12)	(0.15)	(0.12)	(0.14)	(0.11)
Age	1.03	0.58	1.03	0.58	1.05***	1.05**	1.05***	1.05**
	(0.02)	(15.05)	(0.02)	(14.94)	(0.01)	(0.02)	(0.01)	(0.02)
Education level	1.07	1.23**	1.06	1.23**	1.05	1.22*	1.04	1.22*
	(0.05)	(0.10)	(0.05)	(0.10)	(0.06)	(0.11)	(0.06)	(0.11)
Risk aversion	1.02	1.06	1.02	1.06	1.00	0.97	1.00	0.97
	(0.03)	(0.06)	(0.03)	(0.06)	(0.04)	(0.07)	(0.04)	(0.06)
Patience	1.19***	1.29***	1.18***	1.29***	1.19**	1.22*	1.19**	1.22*
	(0.05)	(0.09)	(0.05)	(0.09)	(0.06)	(0.10)	(0.06)	(0.10)
Married	1.28	1.15	1.29	1.15	1.18	0.98	1.19	0.98
	(0.18)	(0.26)	(0.18)	(0.26)	(0.19)	(0.26)	(0.20)	(0.26)
Retired	1.95**	1.81	1.90**	1.81	2.40**	1.00	2.31**	0.98
	(0.46)	(0.72)	(0.45)	(0.73)	(0.67)	(0.58)	(0.64)	(0.58)
Unstable jobs	0.69**	1.50	0.70**	1.51	0.65**	1.40	0.66*	1.41
	(0.09)	(0.37)	(0.10)	(0.37)	(0.11)	(0.42)	(0.11)	(0.42)
Wage worker	0.85	0.74	0.85	0.74	0.79	0.70	0.79	0.70
	(0.12)	(0.16)	(0.12)	(0.16)	(0.13)	(0.19)	(0.13)	(0.19)
Public sector	2.41**	0.97	2.23**	0.97	3.33**	2.03	3.12**	1.98
	(0.71)	(0.51)	(0.66)	(0.52)	(1.21)	(1.28)	(1.15)	(1.26)

(Continues)

TABLE 2 (Continued)

Baseline: no preparation	(1) Whole sample		(2) Whole sample with interaction		(3) Subsample		(4) Subsample with interaction	
	Public included	Private only	Public included	Private only	Public included	Private only	Public included	Private only
Children	0.86	0.33***	0.84	0.33***	0.75	0.28***	0.74	0.27***
	(0.16)	(0.08)	(0.16)	(0.08)	(0.17)	(0.08)	(0.17)	(0.08)
Home ownership	2.33***	2.45***	2.27***	2.43***	2.21***	2.43***	2.17***	2.41***
	(0.28)	(0.51)	(0.27)	(0.51)	(0.32)	0.60)	(0.31)	(0.60)
Saving	2.25***	3.14***	2.25***	3.14***	2.34***	2.25**	2.33***	2.25**
	(0.30)	(0.78)	(0.30)	(0.78)	(0.36)	(0.60)	(0.36)	(0.61)
Constant	0.01***	0.01***	0.00***	0.01***	0.00***	0.00***	0.00***	0.00***
	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)	(0.00)	(0.00)	(0.00)
Fixed effect	Yes		Yes		Yes		Yes[a]	
Observations	2612		2612		1833		1833	

Note: Exponentiated coefficients; standard errors in parentheses. $^{*}p < 0.05$; $^{**}p < 0.01$; $^{***}p < 0.001$. [a]The model with subsample and the interaction term excludes the cohort fixed effect due to the small sample size issue in some groups.

the interaction term shows that the average effect of income instability has only negative associations with public pension, but positive associations with private retirement planning. Though the coefficients do not pass the statistical test, the results paint a picture that income instability mainly affects whether citizens include public pension as the source of old-age income security. Put differently, income instability mainly inhibits citizens' capacity to pool risk socially with other citizens in the society.

The underlying logic is that income instability incentivizes insecure citizens to stabilize present income flows instead of investing money in a public pension scheme, which stabilizes only an individual's income in the distant future. It does not mean insecure citizens do not try to smooth their consumption; they just do so for a much shorter time span. Consumption smoothing becomes an act of self-insurance. Unstable income earners have to self-insure first for present certainty, which act comes at the cost of pooling risk with other citizens that will ensure future certainty. In sum, income instability influences participation in public pensions, but it does not necessarily prohibit people from saving or stocking up assets for the near future. That's why income instability does not predict private means of protection.

Another important argument to be verified is whether private preparation means serve as a substitute for public means of retirement planning. Based on the coefficients of *Home ownership* and *Saving*, the answer is no. Instead, the possession of private assets increases the possibility of using public pension. Home ownership and saving are types of private preparation methods, so it is not surprising to see the positive and significant coefficients between the two. One plausible explanation is that the substitution effects affect only "the amount of resources" one allocates to different preparation methods but not whether one includes public methods. An individual can participate in the public pension and invest in private asset simultaneously; the substitution effect still exists if the individual chooses to allocate more resource to private investment than to public pension. However, having children crowds out resource allocated to other private asset types, suggesting that children serve as a type of private investment for future retirement.

Last, *Patience* has positive and significant associations with retirement planning, regardless of the means used. Yet, *Risk aversion* and *Married* barely have any effect. *Retired* and *Public sector* show only a positive and significant association with risk-pooling choice. Public sector workers are even less likely, though not significantly, to rely only upon self-insurance. *Wage workers* has no effect, while *Unstable jobs* significantly decrease the probability of investing in a public pension.

CONCLUSION

The success (or failure) of any welfare state—particularly nascent ones—relies on citizens' approval (or disapproval) (Brooks and Manza 2006). To understand the social base of welfare states, it is important to study the demand-side politics. In this article, I argue that income instability, a feature of labor market flexibility, affects individual social insurance participation in nascent welfare states. High-income instability incentivizes people to search for security in the present at the cost of participating in social insurance schemes that provide security in the future. The incongruency between insecure workers' time horizon and the required time horizon embedded in social insurance design is the main driver of ineffective social insurance coverage in nascent welfare states. I test this hypothesis in South Korea, focusing on whether and how people plan for old-age security. The results paint the picture that the nonpoor have access to various retirement planning alternatives with more flexible time horizon, causing them to exit the public pension program with more distant and fixed time horizon.

One future research direction is to test how generalizable the negative association between income instability and social insurance participation is under different pension arrangements. In South Korea, because the pension system follows the Bismarck model, one's pension benefit eligibility is closely tied to one's contribution history. As such, income fluctuation interrupts one's contribution regularity, causing significant hampering effect of income instability on social insurance participation. It is expected that the macrolevel institutional arrangements may moderate the relation between income instability and social insurance coverage and that when benefit eligibility and contribution history is more disconnected (i.e.,

when a system follows the Beveridge model), the negative association between income instability and social insurance participation should be attenuated.

Because initial social insurance participation determines the future of social protection regimes in nascent welfare states, income instability can lock these nascent welfare states onto a particular development path. In many developing countries, informal sector already posits a danger for social insurance coverage. Income instability exacerbates the risk, threatening to erode the social foundation of public pension even further. As the upper and middle class's support is crucial to the political sustainability of welfare states (Busemeyer and Iversen 2020), their nonparticipation can jeopardize how sustainable social insurance will be in young democracies. One policy implication of this finding is that it would be difficult to expand social protection through contributory programs in young democracies because they lack the behavioral foundation to buttress the contributory institutions. Recent studies have shown that the possibility of income interruption (i.e., employment vulnerability) drives people's demand for noncontributory policies and many developing countries (e.g., Latin America) adopt noncontributory social pension as a way to enhance senior citizens' income security (Carnes and Mares 2013, 2015). In South Korea, we already observed the same development trajectory. In 2007, the government introduced Basic Old-Age Pension as a response to the low effective coverage of the NPS. While the noncontributory program route is a popular policy alternative, the fiscal burden or financial sustainability can become an issue. How to build a financially sustainable social security system amid a more flexible labor market environment is a challenge for many young democracies in the 21st century.

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SUPPORTING INFORMATION

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