

A Comparative Sociological Analysis of Pension Regimes and Social Stratification in Aging Societies

Xiao Wang

*University of Southern California, Los Angeles, USA
Xwang089@usc.edu*

Abstract. Population aging, declining fertility, and increasingly fragmented labor markets have placed growing pressure on pension systems in advanced economies, while also intensifying inequality in old age. Moving beyond fiscal and actuarial perspectives, this paper conceptualizes pension regimes as institutionalized systems of social risk allocation that shape post retirement class outcomes. Using a comparative institutional framework, the study examines three ideal typical regimes: the market oriented system of the United States, the state centered Bismarckian model of Germany, and the balanced multi pillar arrangements of Nordic countries, through stylized and illustrative case simulations with hypothetical but realistic parameters. The analysis shows that market oriented regimes tend to individualize risk and reproduce pre retirement class advantages, state centered regimes stabilize income for labor market insiders while reinforcing employment based stratification, and balanced multi pillar regimes diffuse risks across institutional pillars, resulting in more inclusive and stable class outcomes in old age. The study is limited by its reliance on ideal typical comparisons and stylized simulations rather than empirical micro level data, but it provides a sociological framework for understanding pensions as key mechanisms of stratification in aging societies.

Keywords: pension regimes, social risk allocation, aging societies, social stratification, welfare state comparison

1. Introduction

In developed economies, population aging, falling fertility levels, and a more polarized labor market have put a strain of an extent upon the available pension schemes. Meanwhile, the growth of non-standard jobs and income instability pose a challenge to the existing correlation between stable jobs and foreseeable retirement security [1]. These organizational developments have raised not only the issue of pension sustainability, but also the issue of inequality in old age. The fact that population is aging has raised concerns of sustainability and sufficiency of pension systems in advanced economies. These arguments, though, are commonly put across more of an economic or fiscal perspective, in terms of replacement rates, gaps in funding, over long-term solvency. Sociologically speaking, this is bound to obscure a deeper-rooted problem: pension systems are not instruments of income replacement, but institutions of assigning social risks and conditioning inequality along the life course [2]. The way that the risks linked to fluctuations in the market and variations in

employment, and the demographic transition are dispersed has far-reaching consequences on the retirement outcomes of individuals and their social destinations, after retirement.

There are significant variations in how much pension systems are based on markets, states or collective arrangements. The differences do not only determine the magnitude of the retirement income, but also the extent to which the retirement security depends on previous earnings, stable employment pattern, or collective scheme of sharing risks. Consequently, pension institutions take the key role of reproducing or abating social stratification during old age. There can be a stark difference in the pension benefits received by the individuals of related work efforts based on the way the pension regimes convert the lifetime earnings and employment period into the pension benefits [3]. Applying a comparative institutional framework, this paper conceptualizes pension regimes as mechanisms of institutionalized risk allocation rather than mere policy instruments. Methodologically, the study employs an ideal-typical analysis of the United States, Germany, and the Nordic countries, utilizing stylized case simulations to trace how divergent institutional logics redistribute economic uncertainty. By examining the trajectory from market-driven individualization and state-centered stability to multi-pillar risk diffusion, the research maps the causal chain between regime design, risk exposure, and late-life social positioning. Ultimately, this approach moves beyond descriptive policy comparison to provide a sociological account of pensions as a central engine of stratification in aging societies.

2. Theoretical framework: pension regimes and social risk allocation

In this paper, a sociological viewpoint of pension systems as institutional processes of organizing and distributing the social risks throughout the life course is advanced. Instead of understanding pensions as largely instruments of fiscal policy or policy delivery, the framework highlights the manner in which the various pension regimes convert the uncertainties relating to employment, markets, and demographic change into dissimilar retirement outcomes.

2.1. Pension regimes as institutionalized risk allocation systems

Regarding the sociological perspective, the systems of pension regimes are institutionalized forms of distributing risks that dictate the allocation of economic uncertainty of old age among social strata [4]. These plans mainly pull three types of risks, which include market risk (financial changes), employment-related risk (career instability) and demographic risk (longevity and old age). Through this notion of institutional design people can associate the idea of pension regime to post-retirement stratification [5]. This model gives a theoretical application of how the same amounts of labor market participation might have different class positions during old age, in as much as the underlying risks are mediated structurally. These risks are widely distributed differently among various institutional models. The systems with a market orientation have the propensity to individualize the risk and, as a result, the retirement security is transformed into a manifestation of lifetime disparities and market-timing. By comparison, state-centred regimes place more emphasis on collective pooling countercyclical to market fluctuations but tend to consolidate labour market insiders and outsiders by basing employment entitlements on employment. Lastly, the diversification through balancing of multi-dollar structures lowers the risk concentration in terms of the pillars of the public, occupational and funded structures.

2.2. From risk allocation to post-retirement class outcomes

The development of the social risks in terms of pension regimes directly influences the post-retirement class positions. Because the pension rights earned depend on institutional logic and not on personal needs, the result of retirement is a compounding of regime development and career path in general. As a result, pensions are institutional processes that convert inequalities at the working age into the differentiated aspects of security status, and social membership in the later period of life.

Pension systems are associated with reinforcing the advantages of classes in market-oriented regimes that bind income to the individual earnings and financial performance. The wealthy are in a better position to accumulate wealth and absorb market instability compared to people with precarious careers which are compounded [6]. Retirement security, in these situations, is isomorphic to previous position in the classes than a remedy to the same. On the other hand, state-based regimes moderate inequalities in the market by sharing their pools but still clung to employment-based standards [7]. By offering certain predictability to the so-called insiders of the labor market, such systems have the effect of isolating people with cracks in their work history, thereby rearranging stratification by employment history.

Balanced multi-pillar regimes are changing this relationship with a redistribution of risks among public, occupational and funds elements. This diversification undermines the direct flow of labor market inequalities into retiring by office institutional buffers to market grip as well as job perplexity [8]. Compared to previous times when there were no income inequalities, there are no steep currency movements. However, eventually, the quality of the outcomes in the post-retirement classes is determined not only by the accessibility of material resources but also by income predictability. Stable provision maintains participation in social statuses and social involvement, but volatile arrangements lead to marginalization. This framework to connect national pattern of stratification during the aging societies by connecting risk allocation to class outcomes. Consequently, the comparative analysis that follows will examine specific national cases to demonstrate how these divergent institutional logics manifest as concrete patterns of social stratification in late life.

3. Comparative pension regimes and illustrative cases

This section examines how different pension regimes translate institutional risk allocation mechanisms into differentiated retirement outcomes. The analysis does not aim to provide empirical estimates or policy evaluations. Instead, it adopts stylized and illustrative cases with hypothetical but realistic parameters to demonstrate how pension institutions mediate the relationship between life-course trajectories and post-retirement class positions. By focusing on regime logics rather than exhaustive policy details, the section highlights the sociological consequences of pension design for inequality in old age.

3.1. United States

The case of the United States makes a good example of the market-based pension regime in which retirement security is entrenched in the financial market performance. The U.S has one of the most significant pools of privately invested retirement money in terms of the total pension assets in the country, the majority of the retirement resources being defined contribution plans and individual accounts. This tendency is in keeping with wider trends in the OECD on a larger scale whereby

there is a substantial growth in funded pension holdings, but especially in the American environment where the role of the public provision of pensions is relatively small [9]. Public pensions are residual and mainly operate as a backup and those that are employer-provided pensions schemes and individual savings or retirement accounts are the main pillars of retirement. Retirement security is thus quite personal and vulnerability to financial markets is one of the key characteristics of old-age risk. In this institutional setup, the results of retirement are highly determined by the level of income and job security. Increased and uninterrupted income earners can contribute to employer-sponsored retirement plans on regular bases frequently accompanied by employer matching rates, though those with lower and less consistent earnings have under capacity to contribute and reduced access to occupational pensions. Market risk is therefore inefficiently allocated and is a generational advantage to some groups and structural insecurity to the other groups.

To illustrate the mechanics of this stratification, a stylized simulation of a high-earning professional can be employed. Consider a prototypical scenario with an annual income of \$130,000–\$140,000. If this individual allocates 10% of their salary to a retirement account, supplemented by a 4% employer match, the total annual contribution (P) reaches approximately \$19,000. Given a nominal long-run market return (r) of 6.5% over a consistent contributing period (n) of 22 years, the accumulation follows a compound growth logic, expressed as:

$$\text{Future Value} = \frac{P(1+r)^n - 1}{r}$$

When these parameters are used then the future value is projected to be 900,000. Although they are hypothetical values, they can be considered realistic expressions of the market rather than the expression of empirical observations. This simulation reveals that in the case of the professional-technical stratum, market-based regime acts as an effective source of the wealth maintenance, which secures the position of the upper-middle-class during late life. But in case of people whose career tracks are not smooth or that have lower, the lack of such compounding mechanisms is converted into increased exposure to social marginalization. Finally, the U.S. system is one process that strengthens lifetime class difference, and retirement is more of a continuation of structural privilege than a social redress.

3.2. Germany

In Germany, the pension system shows different characteristics. The pension system represents a classic Bismarckian model in which the first pillar dominates the overall retirement income, typically accounting for 70 percent of total benefits [10]. The second pillar serves as a significant supplement to the pension, but the third pillar is relatively weak and yet to be universally accessible to the middle class. The benefit amount is determined by four core parameters: earning points (EP), the current pension point value (RV), the pension type factor (ARF), and the age adjustment factor (ZF) [11]. EP reflects an individual's relative earnings, calculated annually by dividing pensionable income by the national average, and represents the key measure of lifetime contributions. RV converts accumulated points into monetary benefits and is updated each year to account for wage growth and broader economic conditions. ARF differentiates benefit categories, assigning a factor of 1.0 to old-age pensions and lower coefficients to survivors' or disability pensions. ZF adjusts benefit levels according to the timing of retirement, reducing pensions for early exits and increasing them

for deferred retirement. Together, these four elements form a transparent formula that links individual earnings histories with demographic and economic realities, ensuring consistency and actuarial balance within Germany's pension system. The overall pension account is expressed as

$$\text{Pension} = \text{EP} \times \text{RV} \times \text{ARF} \times \text{ZF}$$

As an example of how the system works, a typical example of an example of status maintenance is a secondary-school teacher in the public sector who has non-stop full-time employment of forty years. Based on the average earner career, the total accrual of about 44 earning points will give a monthly taxpayer pension of about 1,500 Euros. This, supplemented by a small occupational pension of 150, means that the retired person can live a standard of life that is similar to that before the retirement and that in effect would guarantee the traditional middle-class status. Nevertheless, structural weaknesses are also inherent in this scenario. Due to the fact that Germany depends on a pay-as-you-go (PAYG) financing system, this has made the system extremely vulnerable to demographic risk. The reduction of labor forces and falling birth rates have contributed to the necessity to slack the increase in the value of the pension annually. This means that, although the German model has been effective in offering certainty to the security of the labor market insiders, it has been under pressure as railing pressure to maintain intergenerational solidarity in the ageing society. Finally, stratification in this regime is organized based on continuity in employment, where stable career paths are encouraged and less security is created to individuals with fractured patterns.

3.3. Nordic countries

Nordic model, symbolized in this case by Sweden and Denmark is a universalistic and balanced model where three substantial pillars co-exist to alleviate economic insecurity. According to Nordic rather than state-centered models, unlike the residual public pillar in market-oriented ones, or the unyielding points-based systems of the first pillar, the Nordic first pillar is intended to be highly accessible and to be a strong fiscal base. The Swedish system of public pension is a paradigm best example of the Notional Defined Contribution (NDC) model [12]. Within this system each individuals benefits are calculated based on a notional balance, which is contributions based on the index of wage growth, and the annuity dividend which is based on lifespan expectancy [12]. The annual NDC pension is calculated as

$$P = \frac{\text{Notional Balance}}{\text{Annual Divisor}}$$

This structure enables the system to automatically adapt to changes in demographics. In addition, the system also has a Premium Pension provision (2.5% of the earnings deposited in the financial accounts) and negotiated occupational plans. In order to show how effective this multi-pillar structure may be, we can use a representative worker in the manufacturing industry whose thirty-five-year work career has an average salary. The combination of NDC accounts, funded premium pensions and occupational schemes stabilizes the retirement income of this person.

This stable stance proved to be robust throughout the 2010 and the 2014 economic recession. The automatic balancing mechanism used in Sweden was turned on thereby decreasing the annual growth in pensions to about 0.5 percent effectively stopping the anticipated 2 percent rise to create

fiscal sustainability. Although these mechanisms present retirees to temporary fluctuations, the existence of the occupational pillar is a very important cushion, and effectively avoids the abrupt downward mobility characteristic of entirely market-based systems.

Finally, the Nordic regime has a more sustainable retirement benefit compared to the U.S. model (not as volatile to market volatility) and, compared to the German model, is more demographically sustainable. With a diversified risk in the public as well as occupational and funded aspects, such states maintain a wide middle-class position of most of the population. This balanced diversification makes sure that the properties of the social stratification during old age are marked with compressed distributions of incomes and a high rate of social inclusion that represent the main principles of the Nordic welfare state.

4. Conclusion

This paper has considered the pension systems as institutional processes of distributing social risks other than neutral income replacement mechanisms. Using a comparative institutional approach to the United States, Germany, and the Nordic countries, the analysis establishes that specific ways of exposing oneself to market, employment, and demographic risks, which characterize the identified variations, give rise to different post-retirement classes outcomes. These results indicate that pension design is the key in influencing the trends of social stratification within ageing societies. The comparative analysis provides three important insights. To begin with, the market-oriented type of pension regime, in the case of the United States, is more individualized in economic risks and is strongly connected with earnings earned throughout the life cycle and financial markets. The pre-retirement class benefits are mostly recreated in these systems, which contributes to inequality instead of reducing it. Second, state-oriented regimes, as that of the Bismarckian style of Germany, offer more income predictability to those in the population, whose labor market results are commonplace, but stratified according to labor market continuation. Although these systems lessen the exposure to market volatility, they favor labor market insiders and have a lesser protection to people who lack coherent careers. Third, the Nordic countries have balanced multi-pillar regimes that spread the risks among publicly, occupation and funded spheres, and thus, the risks in any sphere concentrations are minimized. This diversification filters the inequality in old age and contributes to the enlargement of middle classes, even in the circumstances of economic or demographic strain. However, this analysis relies on idealized canonical comparisons and stylized simulations using hypothetical but realistic parameters, rather than on empirical data at the micro level. Future research can expand this framework in several directions. For example, empirical studies using longitudinal data could examine how the allocation of institutional risk affects retirement outcomes for people of different genders, immigration statuses, and non-standard employment trajectories.

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