

Study of the Projection Bias Based on the Current Trend of Shanghai Social Insurance

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Abstract: In the context of China's aging population and the post-epidemic era, Shanghai's social insurance payment rate has declined due to relevant policies and projection bias. This study consults the predecessor's achievements in the fields of projection bias theory and behavioral economics, and demonstrates the formation and manifestation of projection bias under the social security phenomenon in Shanghai. People's intense attention and expectation towards the quality of future lives derive irrationality in their decision-making, hence impacting their potential preceiving of social security system. This article aims to explore people's deeper behavioral logical reactions under economic phenomena, as well as the inspiration of behavioral economics in policy research. The article demonstrated the process of people's change in perceiving of the social insurance, which is based on projection bias. This study uses data from the Ministry of Human Resources and Social Security of China and China Financial Regulatory Commission, to decompose the projection bias in holistic phenomena. Also, other possible factors and possible behavioral economics theories leading to the phenomenon have been discussed.

Keywords: behavioral economics, projection bias, social insurance

1. Introduction

Prospect theory allows the predictability of people's behavior to reflect certain laws, and based on this, it guides the development of behavioral economics [1]. Behavioral economics brings a new perspective to economics' dynamic field which is based on people's behavior and psychology. For example, identity in economics brings a new sight to the allocation of resources and societal equality [2]. It is a consequence of the societal process, when the drawback of the "hypothesis of rational people" became apparent gradually, as people's behavior became a more significant factor to economics in a diversified society. Policymakers consider more of behavioral identity while implementing regulations. With the help of behavioral economics theories, the central agencies develop a more realistic understanding of the phenomenon.

With the continuous growth of the country, China's social security system changed during the opening-up and reforming period, where the system learned from external experience. It has been officially paid since 1993 and has been continuously improved in the subsequent development process. So far, there are still policies aiming at enriching detailed aspects of social security being proclaimed and implemented, in order to provide basic security for people's lives in a more comprehensive way.

In 1994, the World Bank proposed "Three pillars" for pensions for the first time. This concept is applied in most countries around the world. The first pillar of pension in China consists of the "National Social Security Fund" and "Basic Pension Insurance", which are included in the social security system. The second pillar is provided on an enterprise base, which is enterprise and occupational annuity respectively. The third pillar is generally undertaken by commercial insurance companies. In this sector, people can choose personal pension (implemented in 2022), tax-deferred commercial pension insurance, pension finance, and pension target fund as additional pension services beyond the previous two pillars.

In the past 5 years, China experienced an epidemic period and is now in the post-epidemic era. However, China's economy has not fully recovered until 2023. According to data in 2022 and 2023 from the National Bureau of Statistics of China (NSBC), the two-year average year-on-year growth rate in the first quarter was 4.65%, compared with 3.4% in the second quarter. The decline indicates that the macro economy took pressure in the second quarter [3]. Also, real-estate correction, weak foreign trade, and private investment decline are all signs of the current capital market is very pessimistic about economic growth expectations, particularly the "Atypical resuscitation" of China causing great disturbance to future expectations [3,4]. Besides, The demographic structure of the inverted triangle caused by an aging population and low fertility rate has always been a worry for Chinese society. According to data released by the Ministry of Human Resources and Social Security of China (MOHRSS), the number of people participating in basic pension insurance reached 1.05 billion, participating in personal pension was 19.54 million, and paying contributions was 6.13 million. People participating in the insurance was three times that of the number of people paying contributions, which is enough to show that the current generation of people paying social security is under great pressure.

In China, the public's reaction towards the implemented policies shows a tendency that follow behavioral economics theories. According to a group of data on Shanghai's social insurance payment rate and the corresponding deferred payment policy, the perception of the security of social insurance has changed, and people's following behavior shows projection bias. The purpose of this paper is to study the phenomenon made by people's reaction towards social insurance policy, related to the present social and economic situation, by applying the projection theory and investigating projection bias.

2. Literature Review

2.1. Researches in Behavioral Economics

By applying game theory to different decisions under risks, people are more sensitive to loss than gain. In prospect theory, the decision weight depends primarily on the perceived likelihood and may be affected by ambiguity or vagueness [1]. There are irrational decisions in economic behaviors. People join group behavior, and people's individual behavior is affected by group behavior. This human nature can be demonstrated in bounded rationality, willpower, and selfishness, through the applicable example in savings and financial markets [5]. These delve unlimited potential of behavioral economics, and make the domain of economics get rid of the "hypothesis of rational people".

From a behavioral view, the policymakers' expectations of the effect of policies are deviated from the actual implementation. These phenomena are actually Projection Bias instead of accidental prediction error. In other words, the Projection Bias is a predictable deviation from the future driven by human irrationality due to psychological factors [6]. In fact, Loewenstein also introduced an analytical model of inter-temporal decision-making by incorporating a common form of misprediction of future preferences [7], which is an important contribution to behavioral economics.

This theory can be widely applied, for instance, the formation and the fluctuation of risk tolerance can be deduced based on projection theory, which is also insightful in other areas of asset allocation [8]. Furthermore, in group behaviors, social identity and group membership have very strong effects on individual behavior [9].

2.2. The Process of China's Social Insurance and Social Security System

In the pre-reform period of China, the collective state-owned structured background made the social security system focused on collective interests, there was a lack of homogenization in enterprise-based benefits. Since the "reform and opening up" period, China's social morality has become more inclusive and connected. In the external learning process, the foundation of the later social security and social insurance system was laid [10]. However, up to now, the payment of social insurance rates in China is still a bulky burden [11]. The false payment base of the enterprise makes the total payment rate lower than the policy rate. For the pension system, there's an inadequate basic structure to narrow the gaps between the subsystems [12]. The central state is aware of this drawback and implemented personal pensions in 2022 in order to fill the gap. China is still improving its social security and pension system.

Behavioral economics theories have a significant contribution to social security and insurance policies. They help enhance the understanding of social insurance participation to instruct market adjustments [13] and also help the government target setting, for example, based on natural endowment [14]. Through decades of experience and achievements, behavioral economics theories can help solve the question of how to restore solvency to the Social Security budget [15]. Another study based on projection bias toward insurance showed that transitory conditions can have an oversized, and significant impact on real-world product markets in a way that is difficult to reconcile with rational choice theory [16]. This paper is going to give a sight from projection bias to make supplement on previous studies about social insurance, and to give more inspiration on social security system, social insurance and pension system form behavioral economics perspective.

3. From The Phenomena to The Formation of Projection Bias

3.1. The Analysis of Phenomenon

On the whole phenomenon, there was a scorching decline in Shanghai's social security payment rate.

The paper collected the number of participants in Shanghai social insurance from MOHRSS. The total number of participants in social endowment insurance is demonstrated in Figure.1, including "Basic endowment insurance for enterprise employees" and "Basic endowment insurance for urban and rural residents" respectively. The tendency for this category was increasing from June to December in 2022. The increasing rate declined in the Fourth Quarter in 2022. After that, a significant drop took place between the end of 2022 and the end of the First Quarter of 2023, which went below 16 million people. The quantity of participants began to revive during the Second Quarter, but the quantity still did not go back to the level in 2022.

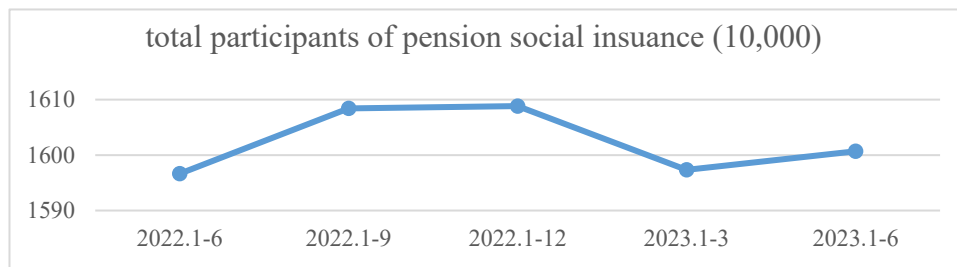


Figure 1: Total participants of endowment insurance (unit: 10,000 people).

Figure 2 demonstrates the participants of the occupational injury insurance, and the unemployment insurance. Both of them started to fall after the Third Quarter of 2022. The fluctuation of occupational injury insurance between June and December of 2022 was outstandingly significant, and there's no sign of reviving in the Second Quarter of 2023. The general tendency of unemployment insurance was similar to the tendency of the endowment insurance, except that the unemployment insurance already started to decrease slightly in the Forth Quarter of 2022. It revived in the Second Quarter of 2023, but still did not go back to the level in 2022.

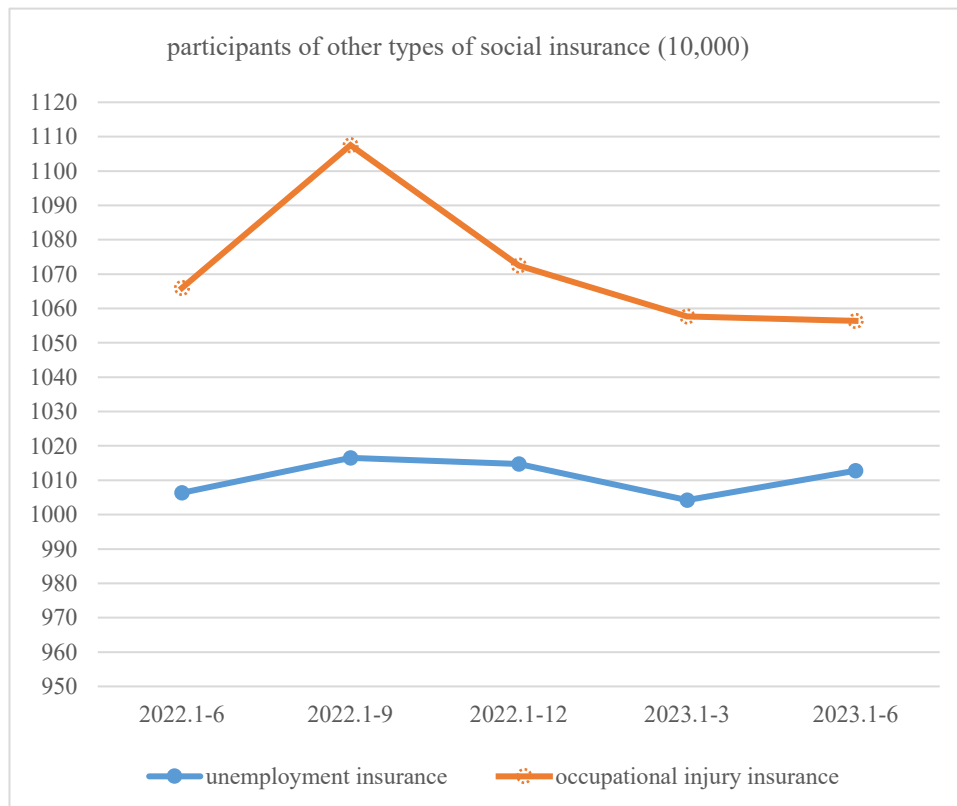


Figure 2: Participants of other types of social insurance (unit: 10,000 people).

The occurrence of these phenomena is affected to a considerable extent by the promulgation and implementation of relevant policies. On November 15th, 2022, the government announced the adjustment of the deferred payment policy of social insurance premiums in stages. The deferred payment policy directly led to the decline of participants in 2023.

Another policy was announced on May 4th, 2023 by MOHRSS of Shanghai, which claimed that under the premise of ensuring that the social insurance benefits of employees are not affected, Shanghai City's policy of gradually reducing unemployment insurance and occupational injury

insurance premium rates will continue to be implemented for an additional 20 months until the end of 2024. It intends to reduce the amount that enterprises and individuals need to pay, reduce the economic burden on enterprises and individual employees, and make all insured units generally benefit from the policy. Therefore, with the effect of the previous policy, the funds for these two types of social insurance increased steadily in 2022, and dropped dramatically in 2023, as demonstrated in Figure.3.

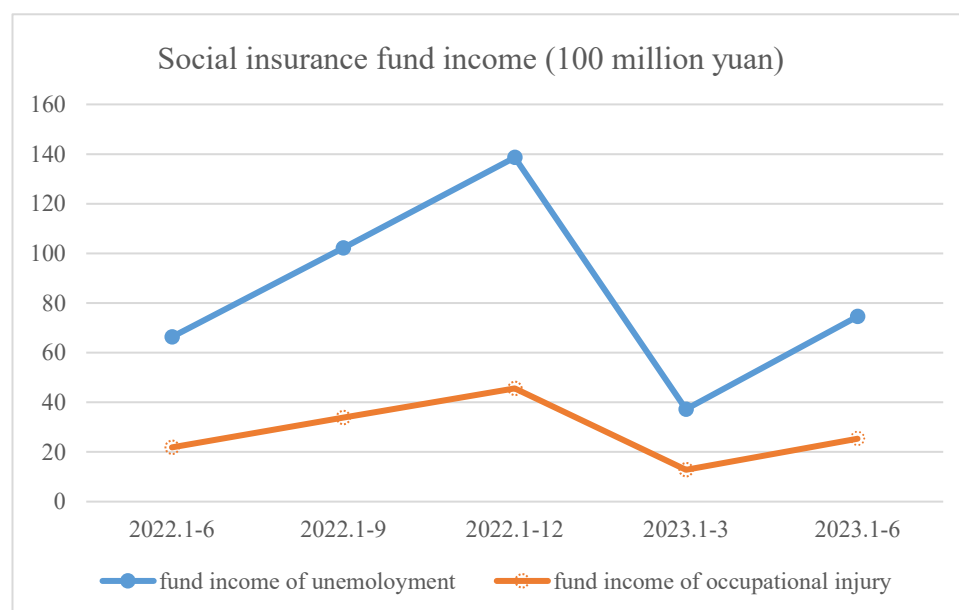


Figure 3: Social insurance fund income (unit: 100 million yuan).

Although these policies have reduced the pressure on enterprises, households, and individuals to pay social insurance, the overall social insurance fund income has further decreased. Under the current background, the aging issue, the decline of the social fertility rate, and the inverted triangle population structure have caused the population receiving pensions to continue to increase on the original basis, while the population of the younger generation paying premiums is relatively decreasing. Premium reductions and deferred payment policies have sent signals that further weaken the younger generation's interpretation and confidence in relying on social security pensions as financial support when they need to retire. In spite of that, during the pandemic, the Chinese government invested enormous funds to prevent the epidemic and maintain people's livelihoods under the lockdown. The large-scale consumption during this period has made China's economy in the post-epidemic era sluggish, and it is difficult to recover the overall economy in the context of the global economic recession, and the social security system has also been affected.

Before the promulgation of the 2022 deferred payment policy, these trends of slowing growth and declining number of participants also reflect that people have realized this cognitive change of social insurance and security system under the current background and began to form projection bias. Therefore, the above two policies can also be understood as the government's response and solution to these pre-existing behavioral phenomena.

The injection continues to decrease while the possible leakage gets greater, and people's confidence in the social security system and the reliability of social insurance naturally decreases. Therefore, people's awareness and understanding of the social security system have changed. Whether it is the social background or the signals released by various policies, people are projecting the life they need to protect in the future in uncertainty. Along with uncertainty about future utility and

uncertainty about current policy direction, the following projection bias based on people's irrationality happened.

3.2. The Study of Projection Bias From The Phenomenon

People react to the phenomenon when the projection effect happens since they have a remarkable ability to adapt to major changes in their life circumstances [7]. As people become less dependent on social insurance, this ability motivates them to seek alternatives in order to ensure their retirement life.

From the view of "Three Pillars of Pension", where the social security system provides the basic pension, the enterprise distributes annuities as supplements, the individual can choose commercial insurance portfolios as personal pension services. For the variance in people's perception of social insurance, the projection behavior will make people diversify their investment in future retirement life, and shift the attention from the first pillar to the other two pillars. For enterprises, because of the shock of the epidemic, the growth rate of bankruptcy cases in 2022 is twice that of last year, and the proportion of compulsory liquidation cases to the total bankruptcy cases reached the highest [17]. This suggests that with the economic recession, enterprises in China are facing great survival challenges. Hence, paying additional annuities is comparatively less important for enterprises, where employees hardly get enough funds to support their pensions. The second pillar is not perfected enough and is currently unable to undertake the important task of guaranteeing employee pensions. Therefore people's reaction to projection behavior turns into commercial insurance. The exact phenomenon should be the increase in commercial pension and the whole commercial insurance, while the decline happening in social insurance.

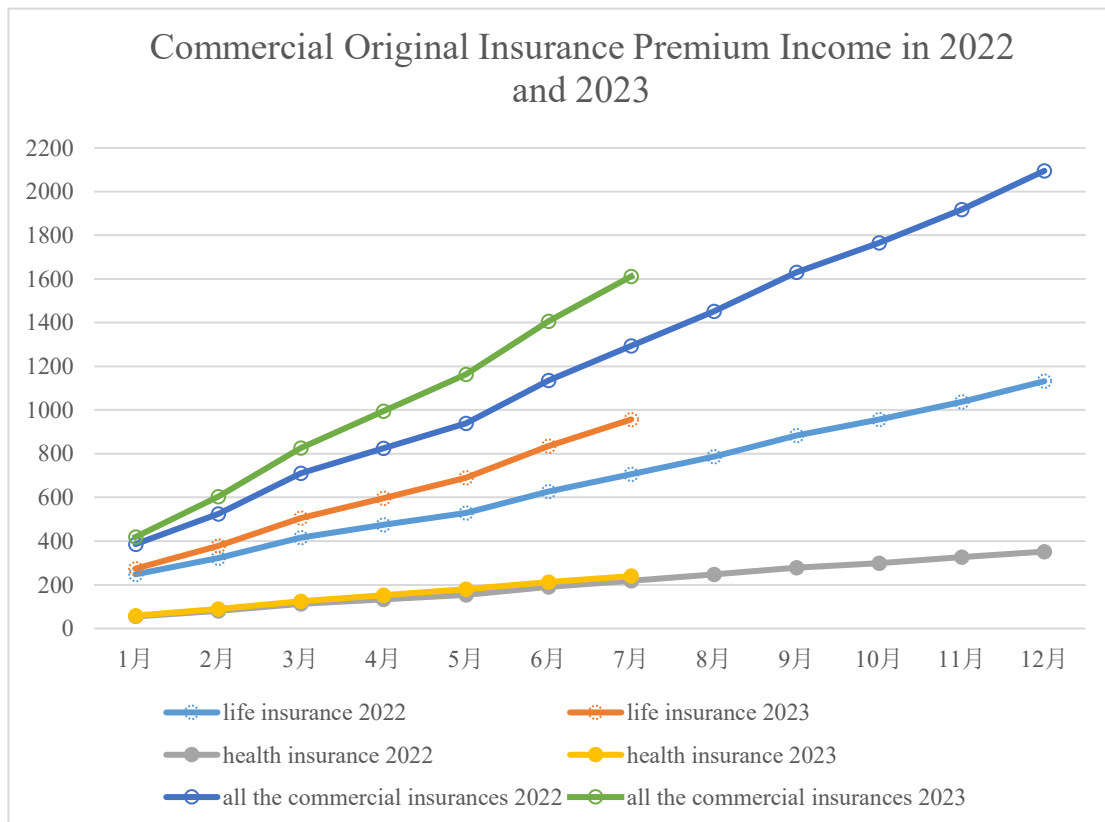


Figure 4: Commercial original insurance premium income in 2022 and 2023 (unit: 100 million yuan).

Figure.4 demonstrates the YoY comparison of commercial insurance premiums in 2022 and 2023, the data is collected from China Financial Regulatory Commission(CFRC). From the tendency of life insurance and the whole commercial insurances, both the amount and increasing rate were larger in 2023 than in 2022. This phenomenon is a manifestation of projection bias. According to projection theory, the working generation projects their expectation of future retirement life according to current utilities of social and commercial insurance. People make the decision of commercial insurance to guarantee their future life because they are not confident about the current circumstances in social insurance.

The projection bias deviates from the actual situation in the future because of people's irrationality. People have well-defined predicted preferences and make decisions to maximize those preferences [7]. When people prefer social insurance, they will have an over-estimated optimistic attitude toward retirement life relying on social basic endowment insurance. On the contrary, when people are more confident in commercial insurance, they will buy more commercial insurance than the actual required demand, and underestimate the protection provided by social insurance.

So far, projection bias has been presented. People's understanding of social insurance's guarantee function has changed, and the current low inflow and high outflow of social insurance make people have pessimistic judgments and projections on the effectiveness of social insurance. People believe that they can no longer rely on social insurance to provide for their pensions and live the retirement life they expected, so they seek other forms of security. Commercial insurance became the best choice for projection, people turned to buy commercial insurance. Therefore, the premium income of commercial insurance has increased significantly compared with the previous year. In this phenomenon, the deviation is reflected in the irrational amplification of people's preferences, where the purchase volume exceeds the utility that people really need in the future.

4. Discussion

China's population structure problem and China's economic downturn in the post-epidemic era cannot fully cover all the factors that have changed people's perception of social security. When the degree of correlation and combination between regional social security policies and other livelihood and industrial policies in the region changes, it will also change people's perception of social insurance. For example, Shanghai's house purchase policy no longer relies on the social security points given by the judgment of the length of time [18]. In addition to this, individual fluctuation in attitude should also be taken into account.

The behavior of investing in insurance can be considered rational. In the process of choosing between different types of insurance, such as diversification from social insurance to commercial insurance, human irrationality plays a role in this process. At the same time, when choosing commercial insurance, differences in personalities and identities will lead to irrational differentiation. For example, some people have a higher income, and the funds saved are enough to live comfortably and deal with emergencies, so they will not choose to buy too much commercial insurance. People with a rigorous personality will give more consideration to commercial insurance purchase planning.

Not only the projection bias, other behavioral economics theories may also be included in the phenomena discussed above. Taking the Herding Behavior as an example, social identity and group membership have very strong effects on individual behavior in group behaviors [9], so the phenomenon of a substantial increase in the purchase of commercial insurance may include the “following behavior” in the herd effect.

5. Conclusion

Projection theory and projection bias have many references and are worth using in policy issuance, implementation, and analysis. Behavioral economics provides many theories based on human irrationality through the study and analysis of human behavior. These theories enable policy makers to conduct macro or micro regulation more precisely.

This article mainly discusses the analysis of people's group behavior, and the formation and manifestation of projection bias, taking the social security phenomenon in Shanghai as a case. Under the corresponding social background, the group perception of China's social security system and social insurance has changed. According to previous research theories, human irrationality causes people's predictions to deviate from actual rational needs to a certain extent, so the current commercial insurance purchase volume will differ from the rational demand volume in the future.

With the development of the times, society has become more diversified, the theory of behavioral economics can more effectively assist the precise implementation of policies. The formulation, issuance and implementation of policies cannot be separated from human irrationality. Human individual behavior and group behavior will be affected by human irrationality. Whether the government formulates policies related to social security pensions or other industries, paying attention to and making use of human irrationality helps to achieve the most efficient policy promulgation process.

References

- [1] Kahneman, D., & Tversky, A. (1977). *Prospect theory. An analysis of decision making under risk*. Defense Technical Information Center. <http://dx.doi.org/10.21236/ada045771>.
- [2] Akerlof, G. A., & Kranton, R. E. (2000). *Economics and identity**. *Quarterly Journal of Economics*, 115(3), 715–753. <https://doi.org/10.1162/003355300554881>.
- [3] Liu, Y. (2023, July 27). Liu Yuanchun: Some views and policy suggestions on the current macroeconomic situation (X. Shao, Ed.). <Http://Ier.Ruc.Edu.Cn/>; China Macroeconomic Forum. <https://mp.weixin.qq.com/s/lFZ24YLX6QEp536r4D4ccg>.
- [4] Wang, Q. (2023, July 20). Wang Qing: Why must we maintain a high level of vigilance for the “atypical recovery” of the Chinese economy? <Http://Ier.Ruc.Edu.Cn/>; China Macroeconomic Forum. <https://mp.weixin.qq.com/s/WFU0doyK3V3TB1l9c-t3gQ>.
- [5] Mullainathan, S., & Thaler, R. (2000). *Behavioral economics*. National Bureau of Economic Research. <http://dx.doi.org/10.3386/w7948>.
- [6] Loewenstein, G. (2005). *Projection bias in medical decision making*. *Medical Decision Making*, 25(1), 96–105. <https://doi.org/10.1177/0272989x04273799>.
- [7] Loewenstein, G., O'Donoghue, T., & Rabin, M. (2003). *Projection bias in predicting future utility*. *The Quarterly Journal of Economics*, 118(4), 1209–1248. <https://doi.org/10.1162/003355303322552784>.
- [8] Grable, J., Lytton, R. H., O'Neill, B., Joo, S.-H., & Klock, D. (2006). *Risk tolerance, projection bias, vividness, and equity prices*. *The Journal of Investing*, 15(2), 68–74. <https://doi.org/10.3905/joi.2006.635632>.
- [9] Charness, G., & Chen, Y. (2020). *Social identity, group behavior, and teams*. *Annual Review of Economics*, 12(1), 691–713. <https://doi.org/10.1146/annurev-economics-091619-032800>.
- [10] Lin, K., & Kangas, O. (2006). *Social policymaking and its institutional basis: Transition of the Chinese Social Security system*. *International Social Security Review*, 59(2), 61–76. <https://doi.org/10.1111/j.1468-246x.2006.00239.x>.
- [11] Meng, ke, & Tuo, H. (2022). *How Heavy is China's Social Insurance Premium: Taking Basic Pension Insurance for Urban Employees as an Example*. CNKI. <http://kns.cnki.net/kcms/detail/detail.aspx?doi=10.16775/j.cnki.10-1285/d.2022.09.007>.
- [12] Li, B. (2014). *SOCIAL PENSION UNIFICATION IN AN URBANISING CHINA: PATHS AND CONSTRAINTS*. *Public Administration and Development*, 34(4), 281–293. <https://doi.org/10.1002/pad.1687>.
- [13] Rickne, J. (2013). *Labor market conditions and social insurance in China*. *China Economic Review*, 27, 52–68. <https://doi.org/10.1016/j.chieco.2013.07.003>.
- [14] Feng, L., Bao, H. X. H., & Jiang, Y. (2014). *Land reallocation reform in rural China: A behavioral economics perspective*. *Land Use Policy*, 41, 246–259. <https://doi.org/10.1016/j.landusepol.2014.05.006>.

- [15] Cottle Hunt, E., & Caliendo, F. N. (2022). *Social security and risk sharing: A survey of four decades of economic analysis*. *Journal of Economic Surveys*, 36(5), 1591–1609. <https://doi.org/10.1111/joes.12492>.
- [16] Chang, T. Y., Huang, W., & Wang, Y. (2018). *Something in the air: Pollution and the demand for health insurance*. *The Review of Economic Studies*, 85(3), 1609–1634. <https://doi.org/10.1093/restud/rdy016>.
- [17] Poyiyun. (2023, July 4). *Exclusive release / China's bankruptcy industry big data report (Issue 1)*. Poyiyun. <https://baijiahao.baidu.com/s?id=1770452697408989229&wfr=spider&for=pc>.
- [18] Song, J. (2021). *Shanghai's "social security tycoon" highlights no longer? Policy "patch" to avoid "elderly disk."* *China Economic Weekly*, 94–95.