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When Income Declines and Morbidity Rises: An Inquiry into Consumption Smoothing in the Transition to Retirement in China

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ABSTRACT

China still relies on out-of-pocket (OOP) medical spending, having a high prevalence of catastrophic payments with large poverty impacts for individuals. Taking age-associated morbidity into account, people of an advanced age encounter health-related income shocks more often than younger cohorts. Exploiting the *Harmonized China Health and Retirement Longitudinal Study* (CHARLS), I use a fixed effects regression model to investigate whether pensions and health insurance allow for consumption smoothing in the presence of health shocks. I provide suggestive evidence that pensions slightly decrease non-food consumption when health shocks occur. Moreover, health insurance does not seem to completely substitute costly smoothing mechanisms. I record an ongoing trend of increasing OOP spending on hospitalization, with health insurance reducing these by 19 percent. Financial transfers from family members remain an important unofficial insurance channel for households to cope with health shocks.

Keywords: health insurance, pension, consumption smoothing

1   Introduction

Universal health coverage is an important concept towards a sustainable future by means of making healthcare accessible and affordable for everyone. Health insurance is a tool to mitigate income shocks and reduce out-of-pocket (OOP) medical expenses, thus, to smooth consumption across different states of health. China still heavily relies on out-of-pocket medical spending, having a high prevalence of catastrophic payments with large poverty impacts (Sun & Lyu, 2020; Van Doorslaer et al., 2005). Despite OOP expenditures consistently decreasing from 60% in 2000 to merely a third of China's total health expenditure sixteen years later (Tao et al., 2020, p. 2), catastrophic health expensespes pushing people into poverty slightly increased between 2012 and 2016, hovering at around 15% of all OOP medical expenses (Fang, Eggleston, Hanson, & Wu, 2019, p. 2-3; Sun & Lyu, 2020, p. 1).

Healthcare providers are paid according to 'fee-for-service' models and, thus, have a strong incentive to capitalize on healthcare and high-value services with higher profit margins on high-tech care and drugs than on basic care (Jiang & Ni, 2020). Providers seek to shift demand among insured patients to these high-margin services that necessitate larger co-payments from patients, according to research conducted by the World Bank (2008). Their analysis of the *Social Protection Household Survey* by China's Ministry of Civil Affairs shows that health shocks such as illness or even death of workers or their dependents, as well as unemployment—as a proxy for very low income—can push households into poverty. Against the backdrop of poverty impacts of these health-related shocks, insurance schemes in China may have adverse effects in that they actually increase the risk of higher OOP spending due to providers being incentivized to capitalize on health care. However, high OOP medical expenditures correlate with low financial protection (Fang et al., 2019), and socioeconomic stratification in healthcare would then lead to high inequality regarding access to medical services and resources not only across different income groups or among the urban and rural Chinese population, but also across age cohorts. Conventional wisdom

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suggests that the elderly and low-income households would be affected the most if no or only ineffective coping mechanisms are accessible. Even after being reimbursed by insurance, the poor suffer most from excessive OOP inpatient contributions amounting to more than half of households' annual per capita expenditures (Yang, 2014). More than two-fifths of the rural elderly in China still live in poverty (Chen, Zhao, Fan, & Xie, 2021).

Considering increased health insurance coverage and new pension schemes in China, the question arises as to (1) whether insurance factually increases or decreases health-related OOP spending if the health sector shifts demand toward high profit margin care, and whether (2) having health insurance and/or (3) claiming pensions—somewhat stable, yet relatively low income sources—can help the elderly cope with health shocks and smooth consumption. With China's basic medical insurance schemes already reaching out to 95% of the population as of 2018 (Tao et al., 2020, p. 3), the stage is set for achieving the 2009 health reforms' goal of universal health coverage. Taking China's demographic transition and increasing age-associated morbidity into account, people of an advanced age may encounter health-related income shocks more often than younger cohorts. Therefore, this paper attempts to test whether pensions can be considered another insurance channel that implies effective consumption smoothing in the event of health shocks, that is, mitigating economic risks and thus reducing the probability of being pushed into old-age poverty. This paper adds up to the body of literature concerning the mitigation of health shocks by adding a layer to existing research about insurance channels in that it considers and investigates income from pensions and retirement cash transfers as one of these channels. The paper thus fills gaps where previous research has mainly focused on health insurance as the main hedge against catastrophic health expenditures.

2   Literature Review

A large body of literature has identified a broad range of health-related income shocks and repercussions such as the burden of out-of-pocket medical expenditure, negative and persistent shocks to productivity and the ability to supply labor, and shifting non-medical consumption patterns related to consumption smoothing mechanisms (Alam & Mahal, 2014; Gertler & Gruber, 2002; Lindelow & Wagstaff, 2005; Liu, 2016; Van Doorslaer et al., 2005; Wagstaff, 2007; Wagstaff, Lindelow, Jun, Ling, & Juncheng, 2009; Wang, Zhang, & Hsiao, 2006).

Wagstaff (2007), lead economist and research manager in the Development Research Group at the World Bank, shows that long hospitalization may increase annual out-of-pocket medical spending. Van Doorslaer et al. (2005) record such spending behavior in excess of 25% of non-food consumption among 10% of the Chinese population (p. 13). Out-of-pocket payments are the principal means of financing health care with China relying on these payments for at least 60% of health financing at the time of Van Doorslaer et al.'s research in 2005 (p. 8), with figures having dropped since then but remaining high at over one-third of total health expenses in 2016 and 2017 (Fang, Eggleston, Hanson, & Wu, 2019; Sun & Lyu, 2020)

However, Liu (2016) from the University of Cambridge provides empirical evidence on the role of public health insurance in mitigating consequences of health shocks in rural China. He exploits a natural experiment from the large-scaled new health insurance program *New Cooperative Medical Scheme* (NCMS) in rural China which raised health insurance coverage of rural households from 15% in 2000 to over 90% in 2009 (p. 3). He finds that household income and consumption are fully insured against health shocks with and even without access to health insurance, and suggests that considerable advantages of health insurance are a) due to reduced out-of-pocket medical cost for treating severe sickness, and b) the decreasing utilization of costly smoothing mechanisms such as household labor supply.

Generally, health insurance prompts people to increasingly access and utilize preventative health services (Lei & Lin, 2009), including general physical examinations and high-value services like vaccination, which in return may help ease the burden on the health system and reduce the pressure on healthcare costs. Jiang and Ni (2020) encourage the uptake and engagement of personal health insurance as a supplement to state health insurance as their findings suggest that the benefits from increasing utilization of preventive healthcare include the simultaneous reduction of the probability of having to be hospitalized by

approximately 30 percent. More insurance and less hospitalization would thus help reduce out-of-pocket medical expenditures.

Alam and Mahal (2014) posit that especially low and middle-income households are often unable to fully smooth income losses from moderate and severe health shocks, rejecting the hypothesis of full consumption insurance during times of major health issues. The authors refer to Lindelow and Wagstaff (2005) who find labor supply effects of 15% less labour market participation after health shocks in tandem with a 6.20% decrease in total per capita income and 10% less earned per capita income. In addition, Wang, Zhang and Hsiao (2006) illustrate that the decline of the percentages of other consumptions is much larger for households with hospitalization than for households with chronic diseases. They highlight that the impact of medical expenditure on household consumption patterns is more significant in low-income households than in high-income households. This is crucial in China where many and particularly low-income households cannot afford long periods of hospitalization, with one quarter of patients discharging themselves against their doctor's advice (World Bank, 2008).

Other studies suggest that the income effect may be quantitatively larger than the effect of health spending, and households could cushion the impacts of health-related income shocks by increasing the labour supply of other family members (Gertler & Gruber, 2002; Lindelow & Wagstaff, 2005; Wagstaff, 2007). Financial transfers from children to parents and older family members as a major component of inter-generational financial transfers in Chinese families and can be considered an additional mechanism to mitigate health issues (Dong et al., 2020; Ko & Möhring, 2021; Wu et al., 2018).

Study results by Xue, He and Hu (2021) that in emerging markets, expanding enrollment in pension funds can considerably strengthen financial health and resilience more so than mutual funds which are exposed to greater market risks. Thus, pensions seem to have a stabilizing effect in the event of health shocks of the elderly in that younger family and household members may not be forced to increase labour supply to cushion health-impacts and consumption.

By exploiting the *China Health and Nutrition Survey 1991-2015*, Hanewald, Jia and Liu (2021) posit that "inequality accumulates with age and is reinforced in old age by the fragmented Chinese public pension system" (p. 1). The vicious circle for more than two-fifths of the rural elderly in China who still live in poverty (Chen, Zhao, Fan, & Xie, 2021) is that income inequality and low income during periods of labour supply prior to retirement generally pose obstacles to contributing to a pool of pension funds for future benefits during retirement. Old-age poverty is one of the potential consequences not only of fragmented and ineffective pension funds, it is also aggravated by age-related increased morbidity and medical expenditures (Hanewald, Jia & Liu, 2021; Li et al., 2020).

According to Chen et al. (2020), Chinese policymakers should consider retirement pensions as an insurance channel in that pension income equals cash transfers that could increase affordability of inpatient and outpatient health services for low-income and poor elderly people. Similar to the effect of supplementary personal health insurance on hospitalization (Jiang & Ni, 2020), pensions and cash transfers can increase access and utilization of preventive health services by the poor due to pensions as an income, thus, reducing hospitalization rates and making healthcare more effective. Cheng, Liu, Zhang and Zhao (2018) find that amoing Chinese rural elderly, pension income has various beneficial effects on health through "improved nutrition intake, better accessibility to health care, increased informal care, increased leisure activities, and better self-perceived relative economic situation" (p. 53).

3   Data

This paper addresses the question of whether pension status and health insurance allow for consumption smoothing in the presence of health shocks by exploiting the *Harmonized China Health and Retirement Longitudinal Study* (Peking University, National School of Development, 2018), including 25,504 individuals over age 45 in China. This analysis uses data or information from the Harmonized CHARLS dataset and Codebook, Version C as of April 2018 developed by the Gateway to Global Aging Data. The baseline wave was conducted in 2011, and the initial sample included 10,257 households and 17,500

individuals in 150 counties and 450 villages or urban communities among 28 provinces. Individuals were followed up every two years. Survey data covering the years 2011, 2013 and 2015 include questions regarding economic standing, physical and psychological health, demographics and social networks of aged persons. The sample used for this research includes respondents who were interviewed in all three survey waves, yielding a sample size of 13,565. The special life history wave fielded in 2014 (wave 3) will not be used in the analysis, for it includes different variables unrelated to those in the other waves. Repeated measurements on each subject allow characterizing the dynamics, changes, and occurrence of health shocks, retirement, consumption smoothing, and more.

Table 1 presents the summary statistics. Head of household respondents were born in approximately 1953/1954 (sd: 11.7) and the majority received primary education. Furthermore, 46.8 percent were male, 60-62 percent held an urban Hukou, and 53-58 percent were married over the period of the survey waves. The share of respondents receiving a public pension rose from 15.1 percent in 2011 to over 33 and 36 percent in 2013 and 2015, respectively, indicating improved income distribution.

Table 1: *Summary Statistics (means)*

Demographics

	Year of Birth	Male	Education	Urban Hukou	Married
2011	1953.872	.468	primary	.603	.534
2013	"	"	"	.621	.532
2015	"	"	"	.62	.581

Pension and Insurance Coverage

	Public pension	Private pension	Pension amount (CN¥ 2010)	Public insurance	Private insurance
2011	.151	.063	2558.452	.924	.017
2013	.365	.108	3217.176	.952	.019
2015	.334	.071	2656.159	.898	.025

Ever diagnosed with …

	cancer	stroke	lung disease	diabetes	Out-of-Pocket Hospitalization (CN¥ 2010)
2011	.009	.031	.135	.054	312.723
2013	.012	.038	.146	.068	757.845
2015	.019	.048	.201	.102	954.287

Consumption and Wealth (in CN¥ 2010)

	Year HH non-food consumpt.	fixed costs/ non-food cons. (month)	Transfers received (last year)	consumer durables (asset value)	Financial assets (net value)
2011	8351.723	295.901	2156.296	2724.393	3630.563
2013	11823.18	433.648	3622.303	3942.748	7354.804
2015	12525.09	492.641	5419.217	4372.337	26808.38

However, high pension coverage and corresponding pension amounts in 2013 may derive from the land expropriation pension that was only included starting from wave 2. Few respondents received private pensions and private health insurance, however, public health insurance coverage was consistently high with close to 90% coverage or more. Over the course of the survey, cancer diagnoses (malignant tumor, excluding minor skin cancer), strokes, lung disease and diabetes rose consistently, with lung diseases such as chronic bronchitis or emphysema being the most prevalent among all. Moreover, yearly out-of-pocket

expenses for hospitalizations had tripled between 2011 and 2015, from roughly 300 to over 900 Renminbi (CN¥ as of 2010). In light of generally high growth rates of the Chinese economy, respondent households were consuming significantly more: yearly expenditures on non-food consumer goods and services rose from an average of 8,351 to more than 12,500 CN¥. These include, for instance, purchase, maintenance and repair of transportation vehicle and communication products, electronics (laptops, computers, etc.), property management fees, clothing and bedding, long distance traveling expenses, furniture, education and training, fitness and beauty expenditures, medical expenditure, etc. (CHARLS, 2018, codebook/documentation, p. 301f). Monthly fixed costs and utility expenses also increased. These include communication and postal fees, Internet usage, telephone and cell phone usage, utilities including water and electricity, fuels including gas and coal, fees for housekeepers, local transportation, household items and personal daily toiletries plus beauty treatments, entertainment including books, newspaper, etc. (CHARLS, 2018, codebook/documentation, p. 299). Amounts of financial transfers from children or grandchildren, parents or parents-in-law and others, also increased more than twofold. Corresponding to increasing overall non-food consumption between 2011 and 2015, one can also record a general trend in increasing asset values of consumer durables, including refrigerator, washing machine, TV, computer, stereo system, camera, air conditioner, mobile phone, furniture, music instrument, valuable decorations, treasures and precious metal and antique, value paintings and calligraphic works, etc. (CHARLS, 2018, codebook/documentation, p. 210f). Regarding financial assets and subtracting debts at the couple level, total non-housing financial wealth is derived from cash and savings value, individual value of stocks and mutual funds, the housing fund, value of government bonds, and all other savings at the couple level (CHARLS, 2018, codebook/documentation, p. 193f), with massive value gains until 2015 as a potential consequence of inflated stock prices that led to the Chinese stock market turbulence in mid-2015 – around the time of data collection and shortly after conducting the third survey round.

4   Estimation

This paper proposes a linear regression with fixed effects to address the role of pensions and health insurance in mitigating adverse outcomes associated with health shocks. To test whether insurance and pensions imply smoothing mechanisms, I will draw on a simple model of consumption choice under two states of the world, put forward by Chetty and Looney (2006, cit. in Liu, 2016). When a less costly smoothing mechanism such as pensions and health insurance becomes available, one would expect that individuals and households substitute these for costlier mechanisms in the event of health shocks. To estimate the effects of health shocks on household choices and expenditures, I consider the following equation:

$$\Delta y_{it} = \alpha_0 H_{it} + \alpha_1 (H_{it} P_{it}) + \alpha_2 P_{it} + H_{it}\gamma_t + \gamma_i + \gamma_t + \beta\, X_{it} + \varepsilon_{it} \tag{1}$$

where Δy_{it} represents the change in the outcome for respondent i in year t: yearly non-food consumption, monthly fixed utility costs and other non-food expenditures, financial transfers from children and family members or others, asset values (consumer durables, financial assets), and out-of-pocket expenditure for hospitalization. H_{it} is a dummy variable indicating a change in diagnoses for cancer, stroke, lung disease, and/or kidney disease. P_{it} is a dummy variable which equals one if pension (public and/or private) or health insurance is available for individual i in year t. The wave fixed effects γ_t allow for secular changes over time, whereas γ_i controls for person-specific effects. I proceed with a vector of control variables X_{it} indicating survey respondents' characteristics such as age and age squared, education, marital status, urban *hukou* status, and number of people living in the household. Following Liu (2016), I include $H_{it}\gamma_t$ as an interaction between wave fixed effects with health shocks, allowing for flexible time trends such as country-wide changes in health care (p. 12).

α_1 identifies the effect of receiving a pension and/or being covered by health insurance in mitigating the adverse outcomes associated with health shocks, respectively. α_2 shows the direct effect of pensions/health insurance on respondents when no health shock occurred at all, and α_0 shows the direct

effect of health shocks in the absence of pensions or health insurance. The sum of α_0 and α_1 yields the predicted effect of health shocks when pension/insurance is available. I expect to find that when health shocks occur and pensions (as a stable income) or health insurance is available, consumption should not fluctuate and respondents should crowd out and not resort to costly smoothing mechanisms such as financial transfers from other family members, or converting assets into cash to pay for medical expenses. If the hypothesis of increased medical costs due to doctors capitalizing on insured patients holds true, this should be reflected by the outcome on variables related to medical expenses, too.

5   Results and Discussion

5.1   Pensions

Table 2 presents the effects of pensions on consumption and wealth in the presence of health shocks. Although only marginally significant at the 10 percent level, the direct effect of a health shock on yearly household non-food consumption is positive, conditional on the fact that no pension is received (1). This suggests that household heads without any income from a pension do not reduce purchases of consumer goods in the presence of a health shock. However, considering that medical expenditure was included in the readily available CHARLS variable of non-food consumption, the latter would thus increase by 24.5 percent as a consequence of medical spending. Interestingly, this value is within the range of excessive out-of-pocket inpatient contributions found by Yang (2014), and even very close to the estimated annual OOP medical expenditure found by Van Doorslaer et al. (2005), who recorded medical spending in excess of 25 percent of non-food consumption.

Table 2: *Effects of Pensions on Consumption and Wealth*

	(1)	(2)	(3)	(4)	(5)
	Δlog HH non-food consumption	log HH consumption (fixed cost)	Δlog transfers received	Δlog asset value	
				consumer durables	financial
Δhealth	**0.245****	-0.127	0.199	-0.0406	0.258
	(0.144)	(0.0863)	(0.192)	(0.114)	(0.232)
Pension	0.105	-0.0294	0.0683	0.125	0.0634
	(0.0954)	(0.0567)	(0.127)	(0.0777)	(0.153)
Δhealth × Pension	**-0.266****	0.0152	0.0635	**-0.212****	-0.211
	(0.142)	(0.0843)	(0.179)	**(0.114)**	(0.230)
Controls	Yes	Yes	Yes	Yes	Yes
Fixed Effects (FE)					
Δhealth × year FE	Yes	Yes	Yes	Yes	Yes
Year fixed FE	Yes	Yes	Yes	Yes	Yes
Individual FE	Yes	Yes	Yes	Yes	Yes
R^2	0.0355***	0.0605***	0.105***	0.0253***	0.128***
N	3699	3788	2567	4104	2701
F	5.766	10.42	10.15	4.807	14.32

Standard errors in parentheses. The coefficient on Δhealth is reported as the overall mean effect of a health shock in the absence of pension income. $^{*} p < 0.10$, $^{**} p < 0.05$, $^{***} p < 0.01$

Thus, it can be hypothesized that households actually may use reduced non-food consumption as a smoothing mechanism in that unessential purchases may be delayed if possible. The predicted net effect of health shocks when pensions are available ($\alpha_0 + \alpha_1$) reinforces the assumption in that yearly household non-food consumption decreases by 2.1 percent. Also, Van Doorslaer et al. (2005) found that out-of-pocket

fees for healthcare absorb 4-5.5 percent of total household consumption in China (p.5), corroborating my findings in that cutting non-food consumption by 2.1 percent may represents a channel for consumption smoothing. Unfortunately, the data cannot clearly account for this and produces only limited evidence.

Nonetheless, the coefficient of health shocks interacted with pensions shows that pensions—as a stable source of income—offset the increased amount of non-food expenditure, yielding the aforementioned net effect of health shocks of -0.021 when drawing on pension income. This net effect may be the result of consumption smoothing or the fact that health shocks may influence the marginal utility of consumption for sick persons. It can be inferred that increased non-food consumption in absence of a pension would in fact account for medical expenditures, that is, the variable may be considered a proxy for out-of-pocket fees or essential drugs/appliances purchased with regard to the medical condition. This is in line with Chen et al. (2020) who inferred that pension income could offset cost barriers to accessing healthcare especially for low-income people, thus, yielding similar effects as the net effect of coefficients from this research (Table 2). Therefore, pension income itself could be considered an insurance channel. To test this assumption for robustness, Table 4 in the appendix presents the estimates of out-of-pocket hospitalization expenses regressed on pension, but does not yield similar effects that would corroborate the findings in Table 2. Thus, income from pensions can provide only modest and rather limited protection for the elderly as was shown by previous research (Chen, Zhao, Fan, & Xie, 2021).

Contrary to that, another possible explanation of the negative net effect yielded by the interaction of health shock with pension could be that a pension represents an income loss in itself, relative to prior income levels from labor supply before retirement. A health shock may decrease non-food consumption, that is, reduced disposable income generally decreases the purchase of consumer goods. Similarly, Chen et al. (2020) found that low pensions reduced utilization of health services (non-food consumption). Moreover, the estimate of households' consumer durables asset value in the presence of health shocks when receiving a pension may corroborate this assumption, despite falling short of significance at the ten-percent level (4). There is no overall effect of health shocks or pensions on asset value, but there is a crossover interaction: the effect of health shocks is different for those claiming pension income, recording an estimated 21.2 percent reduction in asset value, probably due to smoothing in the face of increased medical spending during episodes of compromised health, relative to those without pension income as they may not have retired and thus have potentially higher income from labor supply. This is in line with a recent study by Hanewald, Jia and Liu (2021) highlighting tremendous income inequality among the elderly as a consequence of the Chinese public pension system, and research by Alam and Mahal (2014) who posit that especially low and middle-income households are often unable to fully smooth income losses from moderate and severe health shocks. However, returning to model (1), and given that the estimate for pension (α_2) is insignificant while those of health shock (α_0) and the interaction term (α_1) are significant, this means that generally, receiving a pension has no main effect on consumption when there is no health shock (α_0=0), rejecting the assumption of a pension representing a substantial income loss.

5.2 Health Insurance

Table 3 present the effects of health insurance on consumption and wealth in the presence of health shocks. When a health shock occurs, one would predict an 81.2 percent reduction in received financial transfers from children or grandchildren, parents or parents-in-law or others, conditional on the fact that health insurance is not available (3).

However, this is offset by the significant interaction term when health insurance is available, with a predicted net effect of health shock on financial support of 0.25 ($\alpha_0 + \alpha_1$), indicating an actual 25 percent increase in financial transfers. This finding implies that when health shocks occur, households may not be able to fully substitute costly consumption smoothing mechanisms such as financial transfers from family members with cheaper ones such as health insurance. The results align with previous studies (Dong et al., 2020; Ko & Möhring, 2021; Sun & Lyu, 2020; Wu et al., 2018) and would suggest that (a) OOP constrictions seem to increase due to generally rising medical costs, necessitating (b) financial support

from the family network and one's children whom traditional norms of filial piety prompt to support their parents.

Table 3: *Effects of Insurance on Consumption and Wealth*

	(1)	(2)	(3)	(4)	(5)
	Δlog HH non-food consumption	log HH consumption (fixed cost)	Δlog transfers received	Δlog asset value	
				consumer durables	financial
Δhealth	-0.196	-0.266	**-0.812****	0.187	-0.0298
	(0.311)	(0.177)	**(0.401)**	(0.246)	(0.527)
Insurance	-0.0577	0.116	-0.107	0.197	0.228
	(0.154)	(0.0901)	(0.215)	(0.124)	(0.258)
Δhealth×Insurance	0.358	0.148	**1.062*****	-0.311	0.216
	(0.289)	(0.164)	**(0.371)**	(0.229)	(0.497)
Controls	Yes	Yes	Yes	Yes	Yes
Fixed Effects (FE)					
Δhealth × year FE	Yes	Yes	Yes	Yes	Yes
Year fixed FE	Yes	Yes	Yes	Yes	Yes
individual FE	Yes	Yes	Yes	Yes	Yes
R²	0.0341***	0.0622***	0.112***	0.0241***	0.129***
N	3712	3802	2580	4117	2703
F	5.563	10.79	10.99	4.589	14.49

Standard errors in parentheses. The coefficient on Δhealth is reported as the overall mean effect of a health shock in the absence of the health insurance. [*] $p < 0.10$, [**] $p < 0.05$, [***] $p < 0.01$

Seemingly contradicting, estimates of Table 4 in the appendix yield a net effect of health shocks on out-of-pocket hospitalization expenditure when insurance is available that is -0.19; one could expect a 19 percent reduction in spending on hospitalization due to insurance. Previous research corroborates lower OOP spending and reduced rates of catastrophic health expenses for the insured (Liu, 2016; Li et al. 2020). Also, bivariate probit estimates by Jiang und Ni (2020) showed that havening supplementary personal health insurance significantly decreases the probability of hospitalization by 0.3, due to increased utilization of preventative health services.

However, this is offset by the significant interaction term when health insurance is available, with a predicted net effect of health shock on financial support of 0.25 ($\alpha_0 + \alpha_1$), indicating an actual 25 percent increase in financial transfers. This finding implies that when health shocks occur, households may not be able to fully substitute costly consumption smoothing mechanisms such as financial transfers from family members with cheaper ones such as health insurance. The results align with previous studies (Wu et al., 2018; Dong et al., 2020; Sun & Lyu, 2020; Ko & Möhring, 2021) and would suggest that (a) OOP constrictions seem to increase due to generally rising medical costs, necessitating (b) financial support from the family network and one's children whom traditional norms of filial piety prompt to support their parents. Seemingly contradicting, estimates of Table 4 in the appendix yield a net effect of health shocks on out-of-pocket hospitalization expenditure when insurance is available that is -0.19; one could expect a 19 percent reduction in spending on hospitalization due to insurance. Previous research corroborates lower OOP spending and reduced rates of catastrophic health expenses for the insured (Liu, 2016; Li et al. 2020). Also, bivariate probit estimates by Jiang und Ni (2020) showed that havening supplementary personal health insurance significantly decreases the probability of hospitalization by 0.3, due to increased utilization of preventative health services.

As shown by the summary statistics in Table 1, out-of-pocket expenses on hospitalization tripled between 2011 and 2015, however, merely a 19-percent reduction of OOP fees through available health insurance can be recorded. This would suggest that medical expenses were not likely to be fully covered by insurance. Thus, although health insurance helps, it falls short of effectiveness against rising costs of the health sector. This has also been highlighted by findings from Wagstaff et al. (2009), Lei and Lin (2009), and Yang (2014), all of which conclude that health insurance schemes can be limited in reducing out-of-pocket and catastrophic health expenditures. There is reason to believe that sick people still rely on costly consumption smoothing and receive financial support from family members or others: transfers increase to cover medical expenses and other costs to mitigate parents' or family members' health issues (Dong et al., 2020; Wu et al., 2018).

Furthermore, only regression model (1) in Table 3 yields statistically significant results that would point towards the utilization of smoothing mechanisms, which none of the other models does, giving scope to the assumption put forward by Liu (2016) that with and even without access to health insurance, household consumption is relatively well insured against health shocks. However, I add that household consumption only seems to be resilient due to increasing financial transfers to cope with health shocks and sustain consumption levels.

5.3 Limitations

In general, health insurance coverage has been consistently high throughout all survey rounds, limiting variability in the data. This decreases the chances to identify various nuanced effects of insurance status in the event of a health shock. Nonetheless, financial transfers were identified as a supplemental insurance channel in tandem with official health insurance to cope with sickness financially. This is consistent with findings by other scholars.

Moreover, variable construction has not been consistent in follow-up survey rounds, which may be due to rapid socio-economic changes within Chinese society. For instance, respondents' credit card balance was only sampled for the financial asset module in 2015, probably due to the fact that China has only recently introduced new financial products such as credit cards or the digitization of payments with mobile money. However, this may skew the data in that values of earlier survey rounds did not account for certain sources of wealth. Moreover, the CHARLS data used in this paper has a high number of households with incomplete information for households' living expenditure in 2013 and 2015, reducing the number of observations as well as potentially introducing bias to estimates in that reasons for missing data may be endogenous.

Nonetheless, the estimates align quantitatively with the findings of other scholars. Pensions and insurance may, therefore, be considered unsuitable predictors of consumption smoothing; other scholars also found overall resilience to health shocks in the absence of insurance due to other available sources such as family members for instance.

6 Conclusion

Summing up, I record an ongoing trend of increasing out-of-pocket spending on healthcare, supporting the thesis of health-care providers seeking to shift demand among patients to medical services with high profit margins. However, health insurance is provided for more than 90 percent of the Chinese population and reduces rising out-of-pocket spending by around 19 percent. However, financial transfers from family members remain an important unofficial insurance channel for households to cope with health shocks and smooth consumption. With an aging population, offspring from the one-child policy era may particularly suffer from the double burden of having to take over medical bills of their reitred parents whilst making their own financial controbutions to inefficient state health insurance, let alone personal health insurance, and to pension plans simultaneously. Health insurance does not seem to completely substitute costly smoothing mechanisms and fully cover ill persons, some of which may subsequently not be able to access health care as easily as others. In light of increasing demand for private insurance schemes, Chinese

policymakers should adjust and de-stratify public health insurance schemes with regard to providing equal access to medical services, to prevent catastrophic health expenditures especially among low-income households to not push them into poverty if they cannot bear rising medical costs. This also holds true for pension schemes, especially with regard to declining substitution rates. I provide suggestive evidence that pensions, as a reduced form of income, slightly decrease non-food consumption when health shocks occur. Additionally, this may also be the result of consumption smoothing, delaying unessential purchases, or the decreased marginal utility of consumption for sick persons in general. However, non-food consumption including medical expenditure increases substantially when health shocks occur but no pension income is received, highlighting a certain extent of income loss due to retirement and corresponding low replacement rates. I find that pensioners' nonfinancial asset is eroded when sickness befalls them, whereas non-pensioners may draw on higher income from labor supply, which would corroborate the assumption that pensions represent an income loss that exacerbates risky health expenditures related to increased morbidity and rising medical costs. Altogether, income from pensions can only provide limited protection for the elderly. In the light of the demographic transition and persisting rural-urban inequality, both health insurance and pension systems need to be addressed by Chinese policymakers to counteract the eventuality of a welfare loss for society as a whole. However, with ongoing liberalization of insurance markets, including the promotion of supplementary personal health insurance or pension accounts, much-needed government reforms and policies for these sectors might be delayed. Future research should focus on these issues.

7   Appendix

Table 4: *Effects of Pensions & Insurance on Out-of-Pocket (OOP) Hospitalization Spending*

	(1)	(2)
	Log OOP	Log OOP
Δhealth	-0.327	**1.983***[*]
	(0.421)	**(1.041)**
Pension	-0.306	
	(0.313)	
Δhealth × Pension	0.386	
	(0.398)	
Insurance		0.767
		(0.695)
Δhealth × Insurance		**-2.173***[**]
		(0.958)
Controls	Yes	Yes
Fixed Effects (FE)		
Δhealth × year FE	Yes	Yes
Year fixed FE	Yes	Yes
individual FE	Yes	Yes
R²	0.0709[***]	0.0774[***]
N	887	895
F	1.366	1.517

Standard errors in parentheses. The coefficient on Δhealth is reported as the overall mean effect of a health shock in the absence of pensions and insurance. [*] $p < 0.10$, [**] $p < 0.05$, [***] $p < 0.01$

8   Competing interests

The author has no conflicts of interest to declare.

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