

Literature Review of Research on the Risk of the Medical Insurance¹

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Abstract

The establishment of the medical insurance system which is fairness and for everyone has been the development direction and goal of the social security system in china. Different scholars from different angle of views, theories and methods to research the development of medical insurance system. This paper sum up the research achievements inland, carding from the definition of risk, identification of medical insurance risk, assessment and control and other aspects of the existing literature and review.

Keywords: medical insurance; risk; literature review

Medical insurance can alleviate the insured patients and their family economic pressure, related to the vital interests of the masses. Compared with other social insurance, medical insurance because of the changes of disease spectrum, the ageing of the population does not determine the specificity factor, system operation process will face more and more severe, more specific risk. Around the theme of medical insurance risk, scholars in our country have discussed, but there still exist some differences in some key questions, which produced great distress in the actual operation level, the smooth realization of hindered the medical insurance reform.

1. The Risk

Risk exists in all fields, the definition of risk first appeared in 1901 USA by A.M. power of the risk and insurance Lee Teuk "economic theory", "risk is an objective reflection about would not happen uncertainty". This is the cognitive definition of concept of risk, the emphasis is not willing to happen and the objectivity of the existence of risk. The French scholar Lemann think, risk is the possibility of "damage". Emphasize the risk brought by the probability of the occurrence of damage and risk events. Risk is the specific conditions, in the specified time, an event the actual results offset the expected results degree, emphasize the relationship between events and the expected. All activities of the risk exists in the people, different activities will bring the risk of different nature, such as disaster risk, often encountered in engineering risk, investment risk, health risk, pollution risk, decision-making risk etc.. Since eighteenth Century, people have been exploring the law of the definition of risk, risk of also dozens of. So far, the risk is not a strict definition, Xu Guodong, Li Xindan (2001) defines risk as "of an event the whole process of the expected objectives, risk is defined using the widely adopted probability and consequences of" adverse factors caused by [1] which is in the field of risk management and insurance.

From the definition of "risk" (Haynes, 1895), to the Boehm model of risk management (Boehm, 1991), Leavitt (1964) model, the fusion of evidence reasoning method and analytic network process (Dempster, Shafer, 1976; T.L.Saaty, 1996) and Riskit method, and then to refine risk identification (Elaine, 2002; Sadoullah, 2010; Ryan Patrick B, 2013), risk assessment (Mc Farlan, 1981; YATES, 1992; Marie Wright, 1999; Raija Koivisto 2009; St phane, Paul, 2014), risk assessment (Robert N.C., 1989; Gautam Biswas, 2001; Fan Ying, Li Chen [2], 2014), risk control (Alavi, 1985; L. Wallace, 1999; Zheng Xiaojing et [3], 2013; Alan J., 2014; Wang Dongsheng et [4], 2015), the research on risk management of Chinese and foreign scholars provide a good foundation for the prevention and control of risk.

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2. Risk Research of Medical Insurance

2.1 The Study of Medical Insurance Risk Identification

According to classification of medical insurance risks, some scholars pointed out that according to the sources, the risk can be divided into internal risk and external risk (Yang Yihua et [5], 2009); according the time, the risk can be divided into long-term risk and recent risk (Yu Guangjun et [6], 1999); more concrete, the risk can also be divided into social and economic risk, moral risk, policy risk, medical risk, management risk (Wu Jianwei et [7], 2001); "uncertainty" risk, system risk, financial risk, monopoly of technology risk, moral risk (Tong Xiaopin [8], 1998); disease risk, moral risk and risk for the aging of the population (Zhou Xiaohong [9], 2014; Chen Xiaoyue [10], 2013), risk for the medical demand, risk for the medical insurance fund (Bai Hui [11], 2008; Xia Bin [12], 2009).

Moral hazard is the invisible risk which widely exist in medical insurance system and could have a strong impact on the medical insurance system, it is also one of the main risk factors which affect the over growth of the medical expenses, there are many related research abroad: Vera-Hernandez Marcos [13] (2004) using the principal-agent model to analyze the moral hazard in medical insurance. Mirrlees, J.A., Roberts M. et al. (2002) and many other scholars have made further research on how to control the moral risk. Davies and Kuhn (1992) analyse the moral risk under the frame of social security, illustrate it is the externalities which lead to the behavior of over-investment on health. Peden E.A. (1998) and other scholars do a lot of researches on reduce medical cost through restraining the service demand of the insured. Ching-To Albert Ma (1997) studied the behavior motivation of doctor-patient game. Domestic scholars also have some researches on the risk of moral hazard, Zhu Xiangjun [14] (2002) did economic analysis on the asymmetric information and effective supply of medical insurance; Bian Wen Xia [15] (2004) studied on the insurance fraud game; Zhang Kan, Feng Zongxian [16] (2004) discussed the influencing factors and controlling of medical insurance hospitalization expense.

The domestic research on the risk of medical insurance, mostly starting from the angle of safety operation for medical insurance fund, summarize the risks that medical insurance system is faced with, and among which the research of the moral risk accounted for a large proportion.

2.2 Medical Insurance Risk Assessment

Scholars do the risk assessment based on the risk model for medical insurance, and the key to risk assessment is estimate and actuarial for the probability of the occurrence and extent of the loss, mean to measure the risk. Through the estimation of risk and degree of adverse impact against its intended target, to selecting the risk management approach and provide a basis for decision-making of risk management (Carl, 1999). Loss probability of medical insurance can be estimated by number of disease occur and remedy times, generally with the fitting of a discrete random variable distribution, mainly Poisson and negative binomial distributions, and so on. Distribution of medical expense amount is positive skewness distribution, exponential distribution, lognormal, Gamma distribution, Pareto distribution, Weibull distribution, medical insurance actuarial studied (Hogg, R. and Klugman, S., 1984; DwPril, N., 1989; Vaughan, E., 1992) with the average of how much medical insurance costs to reflect the extent of the loss, with fluctuation range of compensation expenses to reflect the degree for risk of loss. Accident rate for medical insurance and life insurance are different, people's behavior changing depending on medical self-pay. In General, the lower the proportion of their own expense, people access to higher health services rate and total costs. Different pay scales for different frequencies and costs of loss. Only if under the certain insurance terms and conditions, fully identify the random of loss, people can apply actuarial and a series of risk theory and technological to do research for loss of health insurance, as well as the determine of premiums.

Moral hazard in health-care market has always been widely concerned by the researchers, Kenneth J. Arrow (1963) first proposed moral hazard led to medical market failure, then many scholars have made studies of moral hazard, such as Mirrlees, J.A. (1999), Roberts M. et al. (2002) and many other scholars do further studies on how to control moral hazard. In the relationship between medical insurance and medical costs aspect: Charles E.P. (1972) proposed under medical insurance system, higher self-pay rate of the insured can reduce medical service using and reduce total costs, Ching-To Albert Ma (1997) made game analysis on medical insurance participation parties, discussion maximum efficacy model of medical insurance institutions to wants to makes agent according to itself of interests select action by sought of client.

Zhu Minglai, Yu Xinliang, [17] (2013) forecast and evaluate the paid capacity of China medicare insurance fund, think the pattern of financing and payoff pattern of big disease insurance currently will cause big pressure on medicare fund in long-term balance; Dong Shuhui [18] (2013) think current funding policy of big disease insurance has limitations, recommends the funding standard determined for urban and rural residents medicare funding can be amount of 5% around.

Medical insurance risks research of foreign scholars, tend to use various methods to measure the degree of the impact of risk on the medical insurance system, and scholars inland are lay particular stress on qualitative description on medicare risks and impacts.

3. Medical Insurance Risk Management

The most significant risk of medical insurance system lies in the balance of the medical insurance fund, factors which effect of medical insurance expenses are related to medical insurance system, medical and technological development, demographic change, income and many other factors. Studying the mathematical method of risk include the macro-econometric, demographic math, cross-period overlapping generations models and time series theory. Gareth. D. miles (2001), Rockville. Joan. Blanchard (1998) did a number of studies on macroeconomic theories, think the development of medical technology medical technological advances play an enormous role of promoting the growth of health care costs, and Charles I. Jones (2004), constructed a medical costs model under the influence of variables such as life expectancy, medical technology and so on.

On medical insurance fund risk and the control, Liu Yun, Wen Xiaoni [19] (2002), proposed through designing and achieving the medicare institutions information management system, can realise real-time monitoring integrated fund of raised and operations status; Zhu Wenhua [20] (2004), and Zhong Sui [21] (2006) from risk warning angle, studied medical insurance risk; Wuzhong, [22] (2007) achieved the Shanghai social security fund operations risk warning forecast system and the software; Qin Delin, Gao Zhen Yao [23] (2011) researched of oriented service of Shanghai medicare fund risk control platform; in which, it is especially important to build the social fund risk warning indicators system, some scholars discussed from both inside and outside of system department risk (Sun Yaqin [24],2003) or economic factor, and population factor (Zhang [25],2007), some scholars put risk value (VaR) model into fund investment risk control and to establish the risk warning indicators system (Linyuan [26],2003).

For moral risk, scholars proposed of resolve way main as followings: Evans (1974) advocated introduced government as the middleman for medical insurance market, using intervention policy constraint behaviors of medical service provides, Lin Junrong [27] (2006) proposed the credit scores system to constraint behaviors of medical service provides; Steinmo (1995), and Wang Hongyong [28] (1999), respectively proposed to change medical insurance costs paid way; according to features of China medical system, Wang Sufeng [29] (2007) think that should push forward with healthcare reform, change existing pharmaceutical profit model of medical care; Wu Chuanjian [30] (2006) using the KMRW model to analyze the moral hazard; Miao Yu, Qiu Chunjuan [31] (2013) put forward of fourth review mechanism of the hospital.

Risk prevention and control of social health insurance fund is a problem, at present, domestic research in this area is tentative and partial stage of exploration, still fails to make the system operational prevention and control strategies.

4. Review

In summary, research results about the health insurance fund is rich and productive, for subsequent research has laid a good foundation, but the literature on risk prevention and control of the fund is not a lot, especially research for large health-insurance risk management study are less, and the study has certain limitations, specifically in two aspects:

- (1) Operating a macro sense of the major medical insurance fund, including financing, payment, investment, subsidies and regulation, and many other important areas, has been mostly confined to analysis of investment risks in the operation, and neglect the other important research systematic enough. Also, even if the investment risks and value issues, existing research rarely give clear, effective solutions;
- (2) For risk prevention and control of the major medical insurance fund, and quantification of risk level, risk trend forecasting, risk threshold determination was the key to risk management, there have been studies to qualitative, and quantitative methods and mathematical analysis tools support is still lacking.

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