

## Behavioural, Financial, and Health and Medical Economics: A Connection

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### Abstract

This article briefly reviews some of the literature in behavioural and financial economics that are related to health and medical economics. We then discuss some of the research on behavioural and financial economics that could be extended to health and medical economics beyond the existing areas in theory, statistics and econometrics.

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### Introduction

There are many studies that link behavioural and financial economics to health and medical economics. For example, there is research that links unemployment and health. Jahoda [1] conducts unemployment research during the Depression years of the 1930s, and finds that unemployment is the most important cause of mental and physical problems. Analyzing the relationships between measures of household income and resources, subjectively appraised financial strain and psychological distress, Whelan [2] demonstrates that objectively assessed exclusion from customary lifestyles, involving deprivation of socially defined necessities, is associated with increased psychological distress. Rantakeisu [3] interview young unemployed people in Sweden, and find that variations in the health effects of unemployment are functions of financial hardship and of experiences of shame.

In this short communication, we discuss some of the available research on behavioural and financial economic that could be closely related to health and medical economics, and discuss the possible extensions of these areas. We first discuss the theoretical models that have been developed that could be related to closely health and medical economics in the next section.

The plan of the remainder of the short communication is as follows. In Section 2, some theoretical models are discussed. Alternative statistical and econometrics models are analysed succinctly in Section 3. A brief discussion of empirical models is presented in Section 4. Some concluding remarks are given in Section 5.

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### Theoretical Models

Our first suggestion to authors is to develop theoretical models to link behavioural and financial economics to health and medical economics. There are many theoretical studies in behavioural and financial economics. For example, Wong and Li [4] Wong [5] and others develop some properties for the stochastic dominance (SD) theory for both risk averters and risk seekers, while Wong and Chan [6], Egozcue [7] and others develop some properties for the SD theory for investors with S-shaped and S-shaped utility functions. On the other hand, Wong and Ma [8] generalize the theory on location-scale (LS) family to multivariate setting for both risk averters and risk seekers. They study some general non-

expected utility functions defined over the LS family, and develop some properties for the partial orders and dominance relations defined over the LS family. These theories could be used to explain many important economic and financial issues and anomalies. Alternatively, Lam [9,10] develop a model of weight assignments using a pseudo-Bayesian approach to study the behaviour of investors with conservatism and/or representativeness heuristics. Their model can be used to explain excess volatility, short-term under-reaction, long-term overreaction, and their magnitude effects during a normal financial situation, as well as during a financial crisis and subsequent recovery. Guo [11] extend the theory by developing some properties on the expected earnings shock and its volatility, and establish some properties of investors' behavior on the stock price, as well as its volatility during a financial crisis and subsequent recovery. They also develop properties to explain excess volatility, short-term under-reaction, long-term over-reaction, and their magnitude effects during a normal financial situation, as well as during a financial crisis and subsequent recovery. In addition, Guo [12] develop a theory to investigate the production and hedging behaviors of managers with risk-averse and regret-averse attitudes. They prove that the separation theorem is still alive under regret aversion because regret aversion is independent of the level of optimal production. On the other hand, they find that the full-hedging theorem does not always hold under regret aversion as the regret-averse firms take hedged positions different from those of risk-averse firms in some situations. They also show that with, more regret aversion, regret-averse firms will hold smaller optimal hedging positions in an unbiased futures market and document that, contrary to conventional expectations, banning firms from forward trading affects their production level in both directions. To date, there have not been many theoretical models to link behavioural and financial economics to health and medical economics. Therefore, we suggest that researchers might develop appropriate and relevant theories to link behavioural and financial economics to health and medical economics. For example, it is well known that one's financial situation could affect one's health [1-3]. Moreover, individuals with different attitudes toward risk could lead them to different financial situations. Thus, it could be interesting to develop theories to examine whether different attitudes such as, for example, risk aversion, risk seeking, and regret aversion, could lead to different health and medical situations.

## Statistical and Econometric Models

A second suggestion to researchers is to develop statistical and econometric models to link behavioural and financial economics to health and medical economics. After developing mathematical models, one might consider developing some related statistical and econometric models. The SD theory for both risk averters and risk seekers was developed by Wong and Li [4], Wong [5], among others, and the SD theory for investors with S-shaped and S-shaped utility functions was developed by Wong and Chan [6], Egozcue [7], among others, as discussed in Section 2 above. Subsequently, Bai [13] extend the work of the SD test for risk averters developed by Davidson and Duclos [14] to the SD test

for risk seekers, Bai [15] also extend the previous research by developing the SD tests for investors with S-shaped and S-shaped utility functions. Similarly, after developing some theoretical models to link behavioural and financial economics to health and medical economics, as suggested in Section 2, researchers could consider developing some statistical and econometric models to render the theoretical models applicable to real data. For example, researchers could develop some statistical and econometric models to study whether different behavior such as, for example, risk aversion, risk seeking, and regret aversion, could lead to different health and medical situations.

## Empirical Studies

A third suggestion to researchers is to apply statistical and econometric models to examine the relationship between variables in behavioural and financial economics with variables in health and medical economics. After developing statistical and econometric models, theoretical researchers and practitioners might consider applying the models to analyze real data in order to reveal whether the assertions of the theoretical theories hold in practice. For example, after Davidson and Duclos [14] developed the SD test for risk averters, Bai [13] extended the ideas to obtain the SD test for risk seekers. Subsequently, Bai [15] developed the SD tests for investors with S-shaped and S-shaped utility functions. Researchers might consider applying these tests to analyse some exciting empirical data. For instance, Lean [16] examine risk-averse and risk-seeking investor preferences for oil spot and futures prices, while Hoang [17] study the preferences of risk averters and risk seekers on gold, stocks, and bonds. These ideas could be extended to stock markets where health and medical companies might be listed to link financial economics and behavioural finance directly to health and medical economics. An area of considerable interest is the study by Fong [18] of the preferences for investors with S-shaped and reverse S-shaped utility functions for internet versus "old economy" stocks. Gasbarro [19] examine the preferences for investors with S-shaped and reverse S-shaped utility functions on iShares. Furthermore, Clark [20] evaluate the preferences of risk averters, risk seekers, and investors with S-shaped and reverse S-shaped utility functions to the Taiwan spot and futures markets. Similarly, after developing statistical and econometric models to study the relationship between the interesting and available variables in behavioural and financial economics with variables in health and medical economics, as suggested in Section 3 above, theoretical researchers and practitioners could consider applying the models to real data. Of course, the difficult issues in obtaining access to the crucial data for health and medical analysis may nevertheless be encountered as serious obstacles. Our suggestion is that empirical researchers might consider approaching hospitals, clinics, or local, regional and national governments and other organizations in order to obtain the relevant and accurate data. For example, Chow [21] apply the SD tests developed by Davidson and Duclos [14] and Bai [13] in order to analyze census data obtained from Governments to analyze relative welfare levels of income distributions for the poor and the rich of different groups

of individuals. Another way of obtaining data is to conduct surveys. For example, to test whether the theory developed by Lam [9,10] and Guo [11] could be applied to real data, Chow [22] conduct a survey to examine whether the theory holds empirically by studying the behaviour of different types of Hong Kong small investors in their financial investments, especially during times of financial crisis. Another topic to examine the relationship between variables in behavioural and financial economics with variables in health and medical economics is to examine how cycles and crisis could be related to health and medical economics. For example, Wong and McAleer [23] study the effect of the Presidential Election Cycle on U.S. stock markets, while McAleer [24] explore whether there are any opportunities to profiteer from the dot-com bubble, sub-prime crisis and Asian financial crisis. Such ideas could easily be extended to data considerations in health and medical economics. If individuals could follow their approaches to use cycle and crisis to improve ones' financial situations, this could improve their health [25]. Thus, it could be interesting in studying how the relationship between exploring opportunities from cycles and crises and health situations of investors.

## Concluding Remarks

In this paper, we mainly discuss our work on behavioural and financial economics that could link to health economics and suggest extension of our work to link behavioural and financial economics to health economics. In literature, there are many other theoretical work and econometrics work in behavioural and financial economics. Authors could also extend their work to link behavioural and financial economics to health economics.

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