USING STRUCTURAL EQUATIONS TO ASSESS THE FINANCIAL RISK INDICATORS AFFECTING THE SOCIAL SECURITY ORGANIZATION IN IRAN[1]

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Abstract

Social Security Organization, as the largest custodian of providing social service in Iran, has an important influence on the lives of over 34 million people who are covered by these services. Support packages that are offered by this organization, is one of the most complete social services in the country. Thus, Paying attention to the effective factors in implementation way of this organization's commitments is very important. Financial risk is an appropriate measure to ensure fulfillment of the commitments. In this study, financial activities of Social Security Organization have been studied in the context of the financial statements in the period 2001 to 2013.For evaluating and ranking using structural equations and LISREL software, financial risk indicators have been compared during the period above. The results show that the role of current ratio, quick ratio and current liability-assets ratio in financial risk of this organization are more highlighted than other financial ratios.

Keywords:

Financial risk, Social Security Organization, the structural equations, Lisrel.

[1]- This article is inspired of MA thesis by Khodabande Saeed which was defended in sep ,2013 with the help of Professor Hamidi and professor Mohammad zade as supervisors in Islamic azaduniversity of Qazvin

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Introduction

The term “social security” is formed of the two words "economic security" and "social insurance". This term was used in 1935 American federal bill for the first time. Then in 1948, in article 22 of the universal declaration of human rights adopted by UN general Assembly, this sentence was included that “all people as members of society have the right to have social security.”

According to ILO Convention No. 102, the social security is as a support that society provides for its members against social and economic distress caused by cut or severe decrease of incomes (Research Institute, 2009).

The quality and amount of this support are threatened by several factors. The activity of this type of organizations is always an inherent uncertainty .The most clear type of the financial risk can be considered in an organization inability to meet its commitments timely.

One of the ways to reduce these costs in manufacturing firms is to reduce manpower. This means reducing the amount of received premium by social security organization. Unemployment of production unit has a direct impact on rising costs of unemployment insurance of social security organization (Bureau of Economic and Social Statistics and Computing, 2011). The combination of these factors threatens the financial risk of social security organization.

This organization, like other financial firms, always needs to check its related risks. One of the most important threatening risks of this organization is an inability to meet commitments, appropriately and timely.

The most important problem faced by financial managers in social security organization is to pay timely the amount of legal commitments including retirement pension.

Bankruptcy probability of premium paying workshops , sanctions or the closure risk of companies covered by Social Security Investment Co., (SSI), the increase of government debt to this organization all point the need to have a comprehensive research on the financial risk assessment.

Research literature and background

Despite all planning and careful comments which are done by managers in organizations and companies; there are certain factors that are out of control and with varying degrees of risk it can increase the possibility of not achieving any operational goals. In this regard, the probability of not achieving pre-determined goals is risk. In Longman dictionary, risk is defined as the likelihood of something bad or undesirable. (Longman, 2002, p.245)

The term “financial risk” is defined as an umbrella for a variety of financial risks. This term is the concept of reaching to a downturn and it means of uncertainty in the financial return. (Phillips, Michael, 2013)

Nickels has considered the concept of risk based on many dimensions. He believes the word, risk, refers to loss probability, the degree of loss probability and also the amount of loss probability. While pure risk defines just the loss probability and does not include the benefit probability. (Nickels, 2012).

If there is a summarizing of risk concept to be presented, we can say that risk is a danger will be occurred due to uncertainty about a future event. The more this uncertainty is, so the risk is higher. In fact, each factor that causes a problem and does not let the prediction comes true, is considered as a risk factor.

Due to the concepts presented, the financial risk can be defined as uncertainty about paying debts and paying pension sat deadline.

Anthony Loviscek, in 2013, in an article on the impact of global financial crisis in risk levels of firms, studied the financial risk before and after the financial crisis in 2007 to 2009 in 500 companies. In this study, the single factor model, activity and marketing of each enterprise were analyzed. According to the study, the average correlation coefficient reached from %20 to % 35 and increased %75. Although the results suggest that financial risks have grown significantly but considerable portion of this increase have been in financial firms particularly insurance companies and industrial firms.

Greuning has defined positive and negative changes in future benefits as a value which is on a risk exposure. He refers to all types of effective risks in classification and introduced them in four categories of financial risk, operational risk, business risk and event risk. Financial risk is the risk that directly affects the profitability. Financial risks include the risk of capital structure, revenue structure and profitability, capital adequacy, credit risk, liquidity risk, interest rate risk, market risk and exchange rate risk (Greuning, 2009)

Heiko& Tim &Kim in 2006 studied the impact of risk on the banking process in German banking industry. In this study, the impact of strategic risk, psychological risk, financial risk and performance risk was assessed using structural equation modeling.

Based on this idea, "Ho, Abrahamson &Abbitt "in a research they studied the calculating risk-exposure value in bank balance sheet. This group in their article titled as risk- exposure value of balance sheet analyzed the details of bank balance sheet and they defined the items which contribute in calculating the risk- exposure value for bank and they described the managing use of related information in decision making.

Ringhom& Shy &Stenback, in 2004, conducted a research on the measurement of the likelihood of a liquidity crisis and defining the optimal reserve rate of banks. Based on "Liability management

theory" banks are to borrow from money and capital market in order to meet their liquidity needs. When a bank is faced with immediate needs, it borrows the funds rather than selling the properties.

Methods

This research was descriptive and practical and was conducted as a cross-sectional survey. The research plan was expose facto. The research data was quantitative and consistent and were extracted of financial statements and notes of social security organization during the research periods.

The population in this study included the financial operation of all administrative units of social security organization. These units according to enterprise division involve two sections of insurance and healthcare. Insurance section includes 515 and healthcare section includes 348 units such as hospitals and clinics. According to legal issues, social security organization has legal personality and has to provide a financial statement.

To evaluate, during 2001 to 2013, the performance of social security organization has been studied. To calculate the financial risk, the liquidity ratio and leverage ratio indexes were used. The liquidity ratios the researcher considered are current ratio and quick ratio. The leverage ratios also include debt ratio, current liability- asset ratio and current liability- liabilities ratio.

This study used structural equation modeling to test the hypothesis. Structural equation modeling is a comprehensive statistical approach to test hypothesis about the relationships between observed and latent variables. Structural equation model includes a set of structural equations that describe the casual relationships between variables. In this model, the data form the matrix of correlation (covariance) between variables and a series of regression equations are formulated. In order to analyze the data and to test the hypothesis, it is used the structural equation modeling in LISREL software.

Research model and hypotheses

In this paper, following the study of theoretical principles of financial risk, independent and dependent variables were identified; the following analysis model was designed and tested.

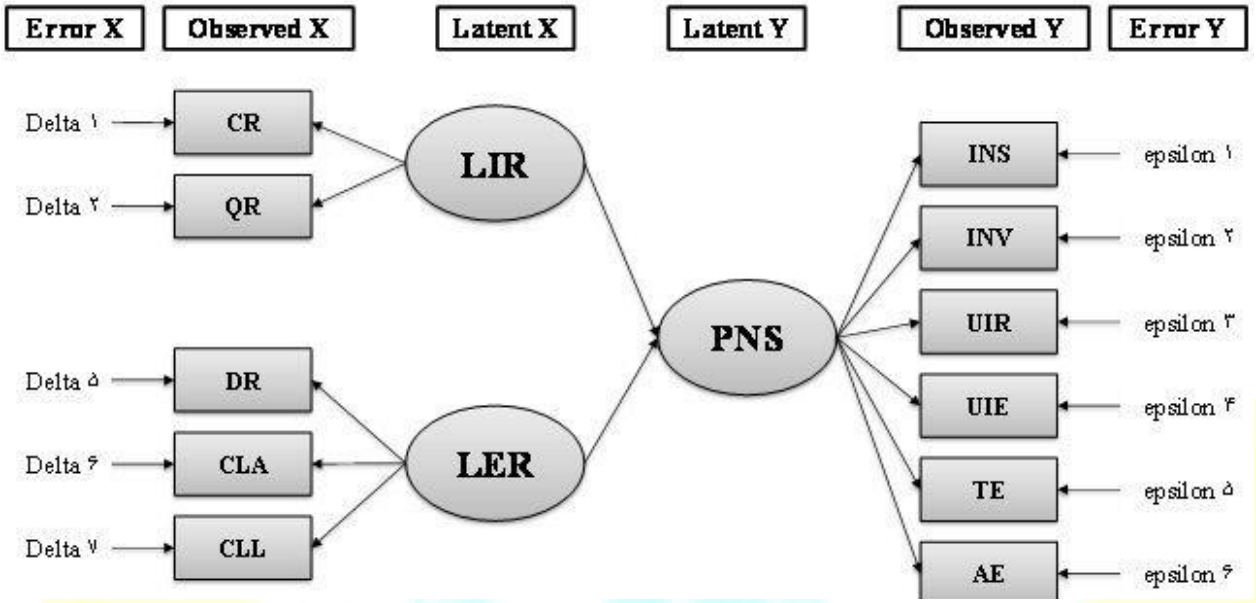

Exhibit 1: the basic model of research

In this model:

CR: Current ratio
QR: Quick ratio
DR: Debt ratio
CLA: Current liability-assets ratio
CLL: Current liability – liabilities ratio
INS: insurance revenue
INV: investment revenue
UIR: unemployment insurance revenue
UIE: unemployment insurance expenditure
TE: treatment expenditures
AE: administrative expenditure
LIR: liquidity ratios
LER: leverage ratios
PNS: Pensions

As mentioned above, the main hypothesizes of this study are:

1) Current ratio has an impact on financial risk of social security organization.
2) Quick ratio has an impact on financial risk of social security organization.
3) Debt ratio has an impact on financial risk of social security organization.
4) Current liability-assets ratio has an impact on financial risk of social security organization.
5) Current liability – liabilities ratio has an impact on financial risk of social security organization.

According to structural equation derived from a basic model of research, the structural equations for the latent internal variables are:

$$PNS = f(LIR, LER, Error)$$

The structural equations for obvious external variables are:

$$LIR = f(CR, QR, Error)$$
$$LER = f(DR, CLA, CLL, Error)$$

The structural equations for obvious internal variables are:

$$PNS = f(INS, INV, UIR, UIE, TE, AE, Error)$$

In above equation, f is a linear function. If we want to write the previous equations more detailed, the amount of paying pensions will be a function of liquidity and financial ratios:

$$PNS = W_1(LIR) + W_2(LER)$$

In this equation, W_1 and W_2 are parameters to be estimated.

Estimation of model parameters

The goal here is to compute a possible value of the parameter covariance matrix implied to be closer to a sample covariance matrix elements; So the goal is to minimize the difference between the two matrix ($S - \Sigma$). From the difference between these two, we will have the residual matrix. Ideally, the elements of residual matrix should be zero; but practically such things are not attainable. Because of this thee is always error quantities in the model. (Kalantari, 2009).

The error level for Chi-square test has been calculated greater than %5. The root mean square error of approximation (RMSEA) that is related to residual model has been obtained less than %1. The value of Comparative fit index (CFI) has been obtained more than %99. Based on results of above indexes, the model has a good fit. The impact coefficient and t–values for obvious external variables have been calculated at %99 of confidence level according to table 1. so all hypotheses are confirmed.

Obvious external variable	t-value	R^2
CR	3.956	0.96
QR	3.734	0.93
DR	2.857	0.79
CLA	3.803	0.95
CLL	2.664	0.75

Table 1: checking and testing the main hypothesis

About the obvious internal variables of this research, the impact coefficient and values at confidence level of %99 have been calculated according to table 2. As a result, the equality of variances will be rejected and the difference of means is significant.

Obvious internal variable	t-value	R^2
INS	6.642	0.95
INV	5.421	0.93
UIR	4.491	0.75
UIE	6.587	0.95
TE	6.499	0.95
AE	6.433	0.95

Table 2: checking and testing the sub-hypothesis

According to calculated correlation coefficient by LISREL software, the structural equations related to the research hypotheses are:

$$LIR = 0/96(CR) + 0/93(QR)$$

$$LER = 0/79(DR) + 0/95(CLA) + 0/75(CLL)$$

$$PNS = 0/95(INS) + 0/93(INV) + 0/75(UIR) + 0/95(UIE) + 0/95(TE) + 0/95(AE)$$

Conclusion

Due to the time factor computed by LISREL software, the role of current ratio, quick ratio and current liability –assets ratio is stronger than the rest of items in this study; In other words, the emphasis on improving the mentioned items causes the higher reduction of risk financial in social security organization.

One way of achieving less financial risk is to increase the range of profitability and to improve break-even of organization. With regard to this topic that organization can not increase the received premium rates because it is legally forbidden, ,it recommended that by increasing the population of its insured people , organization can increase received premium and as a result its break-even.

The minimum monthly wage which is defined at the beginning of each year on one hand is a basis for receiving unemployment insurance and paying unemployment pension to insured by social security organization on the other hand. The increase rate of revenues from unemployment insurance fund to the increase rate of this fund's expenditures is lower. This indicates that there is a decline in the received premium of unemployment insurance; or is the reducing the number of workers involved. In other words, reducing the number of employed people on one hand and increasing the unemployment pension paid to insured on the other hand. This shows the increase of

expenditure to revenues of unemployment insurance fund and as a result the lack of profitability of this fund.

Social security organization is in its middle ages and the average age of insured people has been increased in recent years. There is a reduction procedure in the ratio of incomes from investments to expenses of organization in the years 2001-2013. If this continues, investment will have fewer shares in supplying expenses. It is suggested that with high return investments from last years, this procedure is to be controlled.

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